

2023 PDDC Plant Disease Talks

Diseases of Evergreens

Brian D. Hudelson
Department of Plant Pathology
University of Wisconsin-Madison/Extension



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

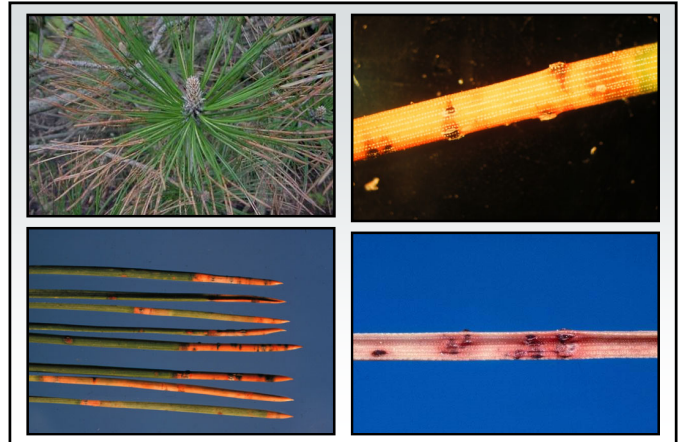
- Control
 - DO NOT plant Colorado blue spruce
 - DO NOT crowd trees when planting
 - Plant dwarf spruce varieties
 - Thin healthy branches to increase airflow
 - Prevent tree stress
 - Prune diseased branches

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
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

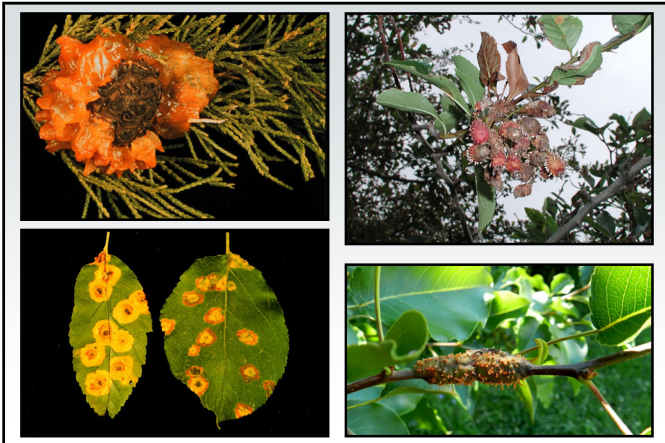
- **Control**
 - Use fungicides to prevent infections
 - Chlorothalonil (alone or with propiconazole or thiophanate-methyl), fludioxonil, metconazole, tebuconazole
 - Alternate active ingredients (FRAC codes)
 - Apply at 7-day intervals
 - Contact the PDDC if you suspect you have infected boxwoods

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 yamadae* – 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” (Available upon request)
 - “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

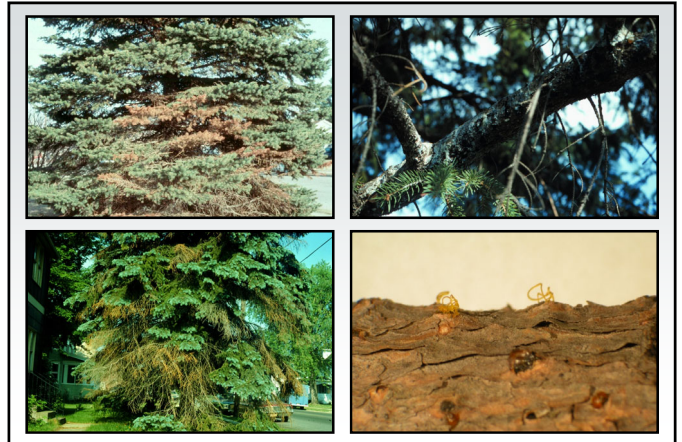
- **Control**
 - Remove and destroy gooseberries/currants
 - Plant pines other than white pine
 - DO NOT overcrowd white pines
 - Keep weeds under control
 - DO NOT overhead irrigate
 - Scout routinely for disease

Diseases of Evergreens White Pine Blister Rust

- **Control**
 - Prune diseased branches
 - Prune healthy branches from the ground up
 - Disinfect 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

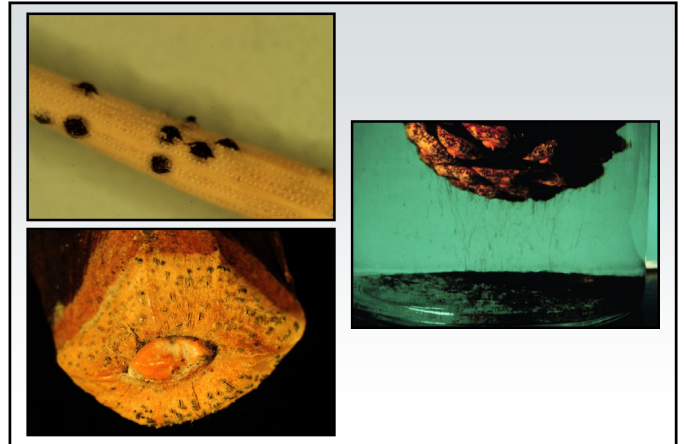
- Control
 - Destroy infected materials
 - Burn (where allowed)
 - Deep bury
 - DO NOT use fungicides

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 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 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 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>
Follow on Facebook, Twitter, YouTube: @UWPDDC
Subscribe to the PDDC Listserv: UWPDDCLearn