

Talks for the General Public

Evil Twins: Plant Disease Look-Alikes

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Evil Twins: Plant Disease Look-Alikes Oak Wilt

- Pathogen
 - *Bretziella fagacearum*
(*Ceratocystis fagacearum*)
 - *Chalara* sp.
- Hosts
 - Red oak group: Red, black, pin
 - White oak group: White, bur, swamp white
 - Chinese chestnut

Evil Twins: Plant Disease Look-Alikes Oak Wilt

- Favorable environment
 - Cool, wet conditions (for infection)
 - Hot, dry weather (for symptom development)



Evil Twins: Plant Disease Look-Alikes Oak Wilt

- Transmission
 - Oak bark beetles
 - *Pseudopityophthorus ninutissimus*
 - *Pseudopityophthorus pruinosis*
 - Sap beetles
 - *Carpophilus* spp.
 - *Epuraea* spp.
 - *Colopterus* spp.
 - *Clischrochilus* spp.
 - *Cryptarcha* spp.

Evil Twins: Plant Disease Look-Alikes Oak Wilt

- Transmission
 - Root grafts
 - Major method of movement in clumps of oaks
 - Commonly form between trees in the same group
 - Red oak group: Red, black, pin
 - White oak group: White, bur, swamp white
 - Rarely form between trees in different groups
 - Movement of up to 20-25 ft/year



Evil Twins: Plant Disease Look-Alikes Oak Wilt

- **Control**
 - DO NOT prune or wound oaks from bud break through 2-3 weeks past full leaf development
 - Disrupt root grafts
 - “Oak Wilt Management: What are the Options?” (<https://learningstore.extension.wisc.edu/>)
 - Mechanically (vibratory plow or trenching machine)
 - Chemically (soil fumigant)
 - Physical barriers

Evil Twins: Plant Disease Look-Alikes Oak Wilt

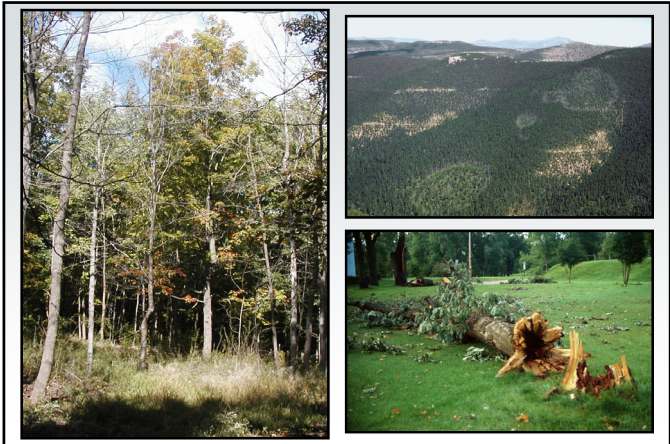
- **Control**
 - Remove diseased (and healthy) trees
 - Decontaminate pruning tools (70% alcohol, disinfectants, bleach)
 - Be careful using oak wood
 - Remove bark
 - Cover wood

Evil Twins: Plant Disease Look-Alikes Oak Wilt

- **Control**
 - Use fungicide injections
 - Propiconazole
 - Prophylactic or therapeutic
 - Inject every 12-24 months

Evil Twins: Plant Disease Look-Alikes Armillaria Root Disease

- **Pathogens:** *Armillaria* spp.
- **Hosts**
 - Many trees and shrubs
 - Some herbaceous plants
- **Favorable environment**
 - Drought stress
 - Defoliation stress
 - Other stresses





Evil Twins: Plant Disease Look-Alikes 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

Evil Twins: Plant Disease Look-Alikes Root/Crown Rots

- **Pathogens**
 - *Pythium* spp.
 - *Rhizoctonia solani*
 - *Cylindrocarpon* spp.
 - *Phytophthora* spp.
 - *Fusarium* spp.
 - *Thielaviopsis* spp.
- **Hosts: Any plant**
- **Favorable environment: Cool, wet soils**



Evil Twins: Plant Disease Look-Alikes Root/Crown Rots

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



Evil Twins: Plant Disease Look-Alikes Root/Crown Rots

- Control
 - Pretest soils/mulches/composts
 - Use a soil-less potting mix or a pasteurized potting mix for containerized plants
 - DO NOT move contaminated soil or plants
 - Disinfect contaminated materials (70% alcohol, disinfectants, bleach)

Evil Twins: Plant Disease Look-Alikes Root/Crown Rots

- Control
 - Use fungicides to prevent infections
 - Contract with a professional pesticide applicator
 - Etridiazole, metalaxyl, mfenoxam, fosetyl-AI, PCNB, thiophanate-methyl, fludioxonil
 - Alternate active ingredients (FRAC codes)
 - Use granular formulations if possible
 - Use during periods of wet weather

Evil Twins: Plant Disease Look-Alikes Root/Crown Rots

- Control
 - Use biopesticides to prevent infections
 - *Trichoderma*, *Gliocladium*
 - Use for potted plants
 - Exercise caution when combining with chemical fungicides

Evil Twins: Plant Disease Look-Alikes Southern Blight

- Pathogen: *Sclerotium rolfsii*
- Hosts
 - Any herbaceous plant
 - Some woody plants
- Favorable environment: Warm, wet weather



Evil Twins: Plant Disease Look-Alikes Southern Blight

- Control
 - DO NOT buy infected/infested plants
 - Avoid cocoa mulch (?)
 - Remove infected plants, mulch and soil
 - Double bag and landfill
 - Disinfect contaminated materials (70% alcohol, disinfectants, bleach)

Evil Twins: Plant Disease Look-Alikes Southern Blight

- Control
 - Amend soil with organic matter (?)
 - Allow affected areas to go fallow
 - Use fungicides for control
 - Contract with a professional pesticide applicator
 - Azoxystrobin, flutolanil, flutolanil + thiophanate-methyl, PCNB, tebuconazole, triadimefon
 - Alternate active ingredients (FRAC codes)
 - Apply at 14 – 28 day intervals
 - Pray for a really, really, REALLY cold winter

Evil Twins: Plant Disease Look-Alikes 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)

Evil Twins: Plant Disease Look-Alikes 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



Evil Twins: Plant Disease Look-Alikes Rhizosphaera Needle Cast

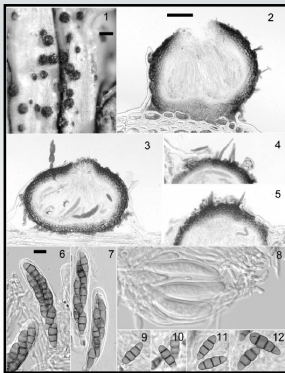
- Control
 - DO NOT plant Colorado blue spruce
 - DO NOT crowd trees when planting
 - Plant dwarf spruce varieties
 - Thin healthy branches to increase airflow
 - Prevent tree stress
 - Prune diseased branches

Evil Twins: Plant Disease Look-Alikes 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

Evil Twins: Plant Disease Look-Alikes 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.

Evil Twins: Plant Disease Look-Alikes Spruce Needle Drop

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

Evil Twins: Plant Disease Look-Alikes Fire Blight

- Pathogen: *Erwinia amylovora*
- Hosts
 - Many woody rosaceous plants
 - Apple, crabapple, pear, mountain ash, cotoneaster
- Favorable environment
 - Wet weather (but not too wet)
 - Hail (or other wounding)



Evil Twins: Plant Disease Look-Alikes Fire Blight

- **Control**
 - Plant resistant varieties
 - “Home Fruit Cultivars for Northern Wisconsin” (<https://learningstore.extension.wisc.edu/>)
 - “Home Fruit Cultivars for Southern Wisconsin” (<https://learningstore.extension.wisc.edu/>)
 - “Top Ornamental Crabapples for Wisconsin” (<https://hort.extension.wisc.edu/>)
 - Prune diseased branches

Evil Twins: Plant Disease Look-Alikes Fire Blight

- **Control**
 - Decontaminate pruning tools (70% alcohol, disinfectants, bleach)
 - Destroy infected materials
 - Burn (where allowed)
 - Deep bury
 - DO NOT over-fertilize with nitrogen

Evil Twins: Plant Disease Look-Alikes Fire Blight

- **Control**
 - Use bactericides to prevent infections (?)
 - Copper, streptomycin
 - Apply
 - Pre-bloom (copper)
 - During flowering (streptomycin)
 - Apply every
 - Two applications at spaced 4 days apart (copper)
 - Multiple applications spaced 3-4 days apart (streptomycin)

Evil Twins: Plant Disease Look-Alikes Bacterial Canker

- **Pathogens**
 - *Pseudomonas syringae* pv. *syringae*
 - *Pseudomonas syringae* pv. *mors-prunorum*
- **Hosts: Stone fruits (plum, cherry, peach)**
- **Favorable environment**
 - Wet weather
 - Cold temperatures
 - Wounding



Evil Twins: Plant Disease Look-Alikes Bacterial Canker

- **Control**
 - Minimize wounding
 - Prune diseased branches
 - Decontaminate pruning tools (70% alcohol, disinfectants, bleach)
 - Destroy infected materials
 - Burn (where allowed)
 - Deep bury
 - DO NOT use bactericides

Evil Twins: Plant Disease Look-Alikes
Tobacco Mosaic

- Pathogen: *Tobacco mosaic virus* (TMV)
- Hosts
 - Many herbaceous ornamentals
 - Many vegetables
- Favorable environment: None
- Transmission: Mechanical
 - Touch
 - Tools



Evil Twins: Plant Disease Look-Alikes
Tobacco Mosaic

- Control
 - Buy plants from a reputable source
 - Inspect plants for symptoms
 - Test plants prior to purchase
 - DO NOT smoke around plants
 - Wash hands routinely with soap and water
 - Keep weeds under control
 - Landfill diseased plants and plant debris

Evil Twins: Plant Disease Look-Alikes
Tobacco Mosaic

- Control
 - Disinfest contaminated materials
 - 1% Sodium dodecyl sulfate (sodium lauryl sulfate) + 1% Alconox® (2½ Tbsp + 2¼ Tbsp/gal)
 - Trisodium phosphate (14 dry oz/gal)
 - 20% low fat dry milk (Carnation®) + 0.1% polysorbate 20 (9½ cups + ¼ tsp/gal)
 - Alcohol dip followed by flaming
 - DO NOT use chemical controls on plants

Evil Twins: Plant Disease Look-Alikes
Cucumber Mosaic

- Pathogen: *Cucumber mosaic virus* (CMV)
- Hosts
 - Many herbaceous ornamentals
 - Many vegetables
- Favorable environment: None
- Transmission
 - Insect (aphids)
 - Mechanical (contaminated tools)



Evil Twins: Plant Disease Look-Alikes Cucumber Mosaic

- **Control**
 - Buy plants from a reputable source
 - Inspect plants for symptoms
 - Test plants prior to purchase
 - Keep weeds under control
 - Remove diseased plants and plant debris
 - Burn (where allowed)
 - Deep bury
 - Hot compost

Evil Twins: Plant Disease Look-Alikes Cucumber Mosaic

- **Control**
 - Disinfest contaminated materials
 - 1% Sodium dodecyl sulfate (sodium lauryl sulfate) + 1% Alconox® (2½ Tbsp + 2¼ Tbsp/gal)
 - Trisodium phosphate (14 dry oz/gal)
 - 20% low fat dry milk (Carnation®) + 0.1% polysorbate 20 (9½ cups + ¼ tsp/gal)
 - Alcohol dip followed by flaming
 - **DO NOT** use chemical controls on plants
 - Consider insecticides for aphid control

Evil Twins: Plant Disease Look-Alikes Herbicide Injury

- **Causes**
 - Growth regulator herbicides
 - 2,4-D
 - Dicamba
 - Imprelis!
 - Other herbicides
- **Affected plants: Any plant**



Evil Twins: Plant Disease Look-Alikes 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

Evil Twins: Plant Disease Look-Alikes Herbicide Injury

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

Evil Twins: Plant Disease Look-Alikes
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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