

Native by Design

Ten Diseases of Native Plants (and Non-Natives, Too)

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Ten Diseases of Native Plants Powdery Mildews

• Causes

- *Erysiphe* spp.
- *Uncinula* spp.
- *Phyllactinia* spp.
- *Blumeria* spp.
- *Oidium* spp.
- *Microsphaera* spp.
- *Sphaerotheca* spp.
- *Podosphaera* spp.
- *Brasiliomyces* spp.
- *Ovulariopsis* spp.

• Hosts

- Virtually everything
- Phlox, bee balm, queen-of-the-prairie



Ten Diseases of Native Plants Powdery Mildews

• Control

- Remove diseased plant material and debris
 - Burn (where allowed)
 - Deep bury
 - Hot compost
- Reduce humidity
 - Plant less densely
 - Thin existing stands
- Use resistant cultivars/varieties

Ten Diseases of Native Plants Powdery Mildews

• Control

- Use fungicides to prevent infections
 - Dinocap, dithiocarbamates, myclobutanil, triadimefon, triforine, thiophanate-methyl, or sulfur
 - Baking soda (1.5 Tbsp/gal) and light weight horticultural oil (3 Tbsp/gal)
 - Alternate active ingredients (FRAC Codes)
 - Apply when humidity >60-70%
 - 7-14 day application interval

Ten Diseases of Native Plants Septoria Leaf Spot

- **Causes**
 - Septoria rudbeckiae
 - Septoria spp.
- **Hosts**
 - *Black-eyed Susan*
 - *Many herbaceous plants*
 - *Many trees and shrubs*

Ten Diseases of Native Plants Septoria Leaf Spot

- **Environmental trigger**
 - *Long periods of leaf wetness*



Ten Diseases of Native Plants Septoria Leaf Spot

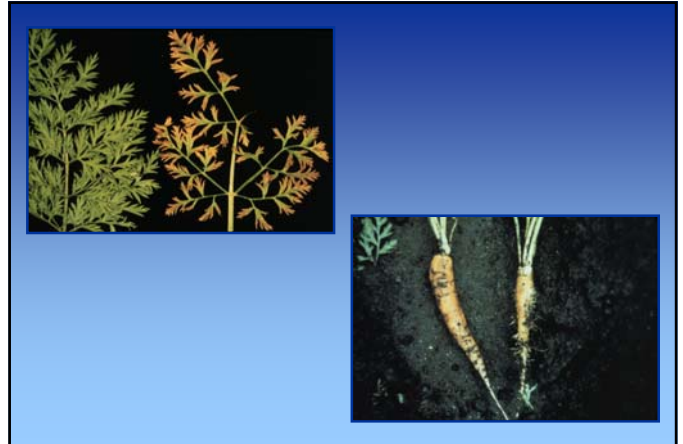
- **Control**
 - *Remove and destroy infested debris*
 - *Move plants to new location (?)*
 - *Use a non-susceptible plant (?)*
 - *Space plants far apart*
 - *DO NOT overhead water*
 - *DO NOT overmulch*
 - *Remove infected leaf tissue (?)*

Ten Diseases of Native Plants Septoria Leaf Spot

- **Control**
 - *Use fungicides to prevent infections*
 - *Copper, chlorothalonil*
 - *Applications every 7-14 days*

Ten Diseases of Native Plants Aster Yellows

- **Pathogen:** *Aster yellows phytoplasma*
- **Hosts**
 - *Many plants in the Asteraceae (aster family)*
 - *Many other plants in many other plant families*
- **Vector:** *Aster leafhopper*



Ten Diseases of Native Plants
Aster Yellows

- **Control**
 - Remove infected plants
 - Control leafhopper vector (?)

Ten Diseases of Native Plants
Root/Crown Rots

- **Causes**
 - Pythium spp.
 - Rhizoctonia solani
 - Cylindrocarpum spp.
 - Phytophthora spp.
 - Fusarium spp.
 - Thielaviopsis spp.
- **Hosts: Anything and everything**
- **Environmental trigger: Cool, wet weather**





Ten Diseases of Native Plants Root/Crown Rots

- **Control**
 - *Moderate soil moisture*
 - *Grow plants in the proper site*
 - *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*

Ten Diseases of Native Plants Root/Crown Rots

- **Control**
 - *DO NOT move contaminated soil or plants*
 - *Decontaminate infested tools, pots, work areas*
 - *Pretest soils/mulches/composts for the presence of root rot fungi*
 - *Use a soil-less potting mix for containerized plants*

Ten Diseases of Native Plants Root/Crown Rots

- **Control**
 - *Use fungicides to prevent infections*
 - *Etridiazole, metalaxyl, mefenoxam, fosetyl-AI, PCNB, thiophanate-methyl, fludioxonil*
 - *Use granular formulations if possible*
 - *Use during periods of wet weather*
 - *Use biopesticides to prevent infections*
 - *Trichoderma, Gliocladium*
 - *Use in pot production*

Ten Diseases of Native Plants “Cedar-Apple” Rusts

- **Cause:** *Gymnosporangium* spp.
- **Hosts:**
 - *Junipers*
 - *Rosaceous plants: apple, crabapple, hawthorn, quince, pear!*
- **Environmental trigger:**
 - *Long periods of needle/leaf wetness*



Ten Diseases of Native Plants "Cedar-Apple" Rusts

- **Control:**
 - Grow only junipers or rosaceous hosts
 - Use resistant cultivars/varieties
 - Remove galls
 - Use fungicides to prevent infections
 - Ferbam, triadimefon
 - Mid-May through mid-June (rosaceous hosts)
 - Early July through August (juniper hosts)
 - 7-21 day application interval

Ten Diseases of Native Plants Chlorosis

- **Cause:** Micronutrient (Fe or Mn) deficiency
- **Sensitive plants**
 - Oaks (especially pin oak)
 - Red Maples
 - Rhododendrons
 - Other woody and herbaceous plants can be affected



Ten Diseases of Native Plants Chlorosis

- **Control**
 - Plant the right plant in the right location
 - Monitor soil pH and soil nutrients
 - Decrease pH using sulfur or aluminum sulfate
 - Add chelated Fe and/or Mn as needed
 - Make sure trees are adequately watered
 - Minimize damage to tree root systems

Ten Diseases of Native Plants Black Knot

- **Cause:** *Apiosporina morbosa*
- **Hosts**
 - *Prunus* species
 - Black cherry!
- **Environmental trigger**
 - Long periods of leaf wetness



Ten Diseases of Native Plants Black Knot

- **Control**
 - DO NOT plant infected Prunus stock
 - Buy black knot-resistant varieties if available (Prunus 'Accolade', Prunus sargentii, Prunus maackii)
 - Remove volunteer plums/cherries
 - Prune diseased branches
 - DO NOT use fungicides

Ten Diseases of Native Plants Verticillium Wilt

- **Causes:** Verticillium dahliae
Verticillium albo-atrum
- **Hosts**
 - Many woody ornamentals (maple, ash, redbud, smoke bush)
 - Many herbaceous plants
 - Many vegetables (tomato, potato, eggplant)
- **Environmental trigger:** Cool, wet weather



Ten Diseases of Native Plants Verticillium Wilt

- **Control**
 - Use appropriate plants in suspect areas
 - Pine, juniper, fir, spruce
 - Beech, birch, ginkgo, hackberry, hawthorn, hickory, honey locust, mountain ash, white oak, bur oak, poplar, serviceberry, sycamore, willow
 - Pretest soils/mulches/composts
 - Control broad-leaf weeds
 - Avoid municipal mulches

Ten Diseases of Native Plants Verticillium Wilt

- **Control**
 - Prevent plant stress
 - Prune diseased (wilted) areas
 - Practice good general plant maintenance
 - Remove diseased plants
 - Destroy infected materials
 - Burn
 - Composting (?)

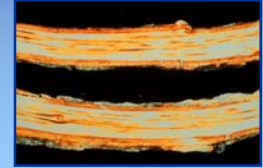
Ten Diseases of Native Plants Oak Wilt

- **Cause**
 - Ceratocystis fagacearum
 - Chalara sp.
- **Hosts**
 - Oaks
 - Chinese chestnut
- **Environmental trigger:** Cool, wet weather

Ten Diseases of Native Plants Oak Wilt

- **Transmission**

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



Ten Diseases of Native Plants Oak Wilt

- **Control**

- Avoid pruning or wounding oaks when they are physiologically active
- Paint wounds as needed
- Remove diseased (and healthy) oaks
- Disrupt root grafts
- Use oak wood appropriately



Ten Diseases of Native Plants Oak Wilt

- **Control**

- Use fungicide injections
 - Propiconazole
 - Prophylactic or therapeutic
 - Every 12-24 months

Ten Diseases of Native Plants Armillaria Root Disease

- **Pathogen:** *Armillaria* spp.
- **Hosts**
 - Many deciduous trees and shrubs
 - Many conifers/evergreens
- **Environmental trigger:** Stress



Ten Diseases of Native Plants **Armillaria Root Disease**

- **Control**
 - Reduce stress where possible
 - Water adequately
 - Fertilize properly
 - Control foliar pathogens
 - Control foliar insect pests
 - **DO NOT** wound trees
 - Remove Armillaria-infested materials

Ten Diseases of Native Plants **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 the clinic on Twitter @UWPDDC