

Wild Ones

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.

Ten Diseases of Native Plants Powdery Mildews

• Hosts

- Virtually everything
- Phlox, bee balm, queen-of-the-prairie, ninebark
- Favorable environment: High humidity



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 other herbaceous plants
 - Tomato
 - Many trees and shrubs

Ten Diseases of Native Plants Septoria Leaf Spot

- **Favorable environment**
 - 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 non-susceptible varieties/plants
 - Space plants far apart
 - DO NOT overhead water
 - DO NOT overmulch
 - Thin plants as they grow

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
- **Favorable environment:** None
- **Vector:** Aster leafhopper



Ten Diseases of Native Plants Aster Yellows

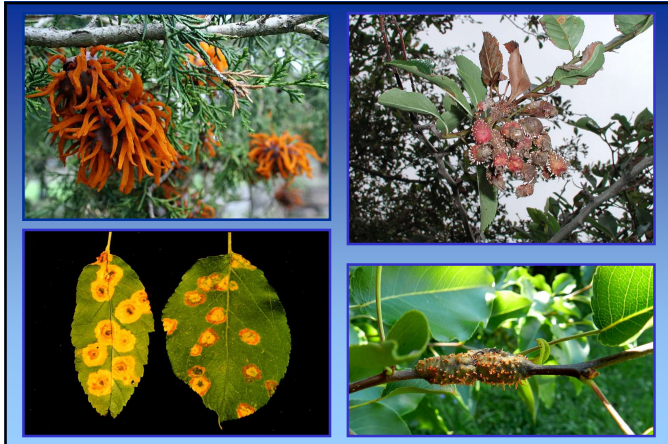
- **Control**
 - Remove infected plants
 - Control leafhopper vector (?)

Ten Diseases of Native Plants Gymnosporangium Rusts

- **Causes**
 - *Gymnosporangium juniperi-virginianae*
(Cedar-apple rust)
 - *Gymnosporangium globosum*
(Cedar-hawthorn rust)
 - *Gymnosporangium clavipes*
(Cedar-quince rust)

Ten Diseases of Native Plants Gymnosporangium Rusts

- **Hosts**
 - Junipers
 - Woody rosaceous plants
(apple, crabapple, hawthorn, quince, pear, serviceberry)
- **Favorable environment**
 - Cool to moderate temperatures
 - Wet



Ten Diseases of Native Plants Gymnosporangium Rusts

- **Control**
 - Grow only the *juniper* or *rosaceous* host
 - Use resistant cultivars/varieties
 - “Juniper Diseases”
(<https://store.extension.iastate.edu/Product/Juniper-Diseases>)
 - Remove galls

Ten Diseases of Native Plants Gymnosporangium Rusts

- **Control**
 - Decontaminate pruning tools
 - 70% alcohol (spray disinfectants)
 - Commercial disinfectants
 - 10% bleach
 - Destroy infected materials
 - Burn (where allowed)
 - Deep bury

Ten Diseases of Native Plants Gymnosporangium Rusts

- **Control**
 - Use fungicides to prevent infections
 - Ferbam, triadimefon
 - Alternate active ingredients (FRAC codes)
 - Apply at 7-21 day intervals
 - Mid-May through mid- June (rosaceous hosts)
 - Early July through August (juniper hosts)

Ten Diseases of Native Plants Black Knot

- **Cause:** *Apiosporina morbosa*
- **Hosts**
 - *Prunus* species
 - Black cherry!
- **Favorable environment**
 - 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
 - Other Verticillium spp.
 - New Verticillium spp.

Ten Diseases of Native Plants Verticillium Wilt

- **Hosts**
 - Many woody ornamentals
 - Common: Maple, ash, redbud, smokebush
 - "New": Seven son flower, wafer-ash, buttonbush
 - Many herbaceous plants
 - Many vegetables (tomato, potato, EGGPLANT)
- **Favorable environment**
 - Cool, wet weather (for infection)
 - Hot, dry weather (for symptom development)



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, 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
 - Hot Compost (?)

Ten Diseases of Native Plants Oak Wilt

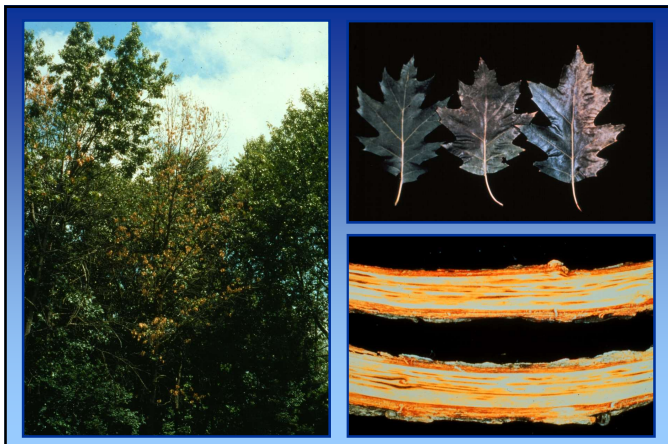
- **Cause**
 - Bretziella fagacearum
(Ceratocystis fagacearum)
 - Chalara sp.
- **Hosts**
 - Red oak group: Red, black, pin
 - White oak group: White, bur, swamp white
 - Chinese chestnut

Ten Diseases of Native Plants Oak Wilt

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

Ten Diseases of Native Plants Oak Wilt

- **Transmission**
 - Oak bark beetles
 - Pseudopityophthorus minutissimus
 - Pseudopityophthorus pruinosis
 - Sap beetles
 - Carpophilus spp.
 - Colopterus 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
- **Favorable environment:** 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 Root/Crown Rots

- **Causes**
 - Pythium spp.
 - Rhizoctonia solani
 - Cylindrocarpon spp.
 - Phytophthora spp.
 - Fusarium spp.
 - Thielaviopsis spp.
- **Hosts: Anything and everything**
- **Favorable environment**
 - Cool temperatures
 - 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-Al, 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 Chlorosis

- **Cause:** Micronutrient (Fe or Mn) deficiency
- **Susceptible plants**
 - Oaks (especially pin oak)
 - Red Maples
 - Birch
 - Blueberry
 - Rhododendrons
 - Other woody and herbaceous plants



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 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
<http://pddc.wisc.edu>
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