

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

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Ten Diseases of Native Plants
Powdery Mildews

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

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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

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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

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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

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Ten Diseases of Native Plants Septoria Leaf Spot

- **Favorable environment**
 - Long periods of leaf wetness

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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

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Ten Diseases of Native Plants Septoria Leaf Spot

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

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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

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Ten Diseases of Native Plants Aster Yellows

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

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Ten Diseases of Native Plants Gymnosporangium Rusts

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

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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

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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

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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

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Ten Diseases of Native Plants 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

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Ten Diseases of Native Plants Black Knot

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

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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

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Ten Diseases of Native Plants Verticillium Wilt

- Causes
 - *Verticillium dahliae*
 - *Verticillium albo-atrum*
 - Other *Verticillium* spp.
 - New *Verticillium* spp.

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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)

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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

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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 (?)

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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

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Ten Diseases of Native Plants Oak Wilt

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

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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

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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

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Ten Diseases of Native Plants Oak Wilt

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

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Ten Diseases of Native Plants Armillaria Root Disease

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

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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

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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

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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

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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

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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

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Ten Diseases of Native Plants Chlorosis

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

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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

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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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