Paging Doctor Death: 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, ninebark

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

• 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
**Septoria Leaf Spot**

- **Causes**
  - *Septoria rudbeckiae*
  - *Septoria* spp.
- **Hosts**
  - Black-eyed Susan
  - Many other herbaceous plants
  - Tomato
  - Many trees and shrubs
- **Environmental trigger**
  - Long periods of leaf wetness
- **Control**
  - Remove and destroy infested debris
  - Move plants to new location (?)
  - Use a non-susceptible varieties/plants (?)
  - Space plants far apart
  - DO NOT overhead water
  - DO NOT overmulch
  - Remove infected leaf tissue (?)

**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

- **Control**
  - Use fungicides to prevent infections
    - Copper, chlorothalonil
    - Applications every 7-14 days
Ten Diseases of Native Plants

**Aster Yellows**

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

**“Cedar-Apple” Rusts**

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

- **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

Black Knot

- **Cause**: *Apiosporina morbosa*
- **Hosts**
  - *Prunus* species
  - Black cherry!
- **Environmental trigger**
  - 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*
- **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

- Pretest soils/mulches/composts
- Control broad-leaf weeds
- Avoid municipal mulches
- 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

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

**Armillaria Root Disease**

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

**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**

- **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.  – *Phytophthora* spp.
  – *Rhizoctonia solani*  – *Fusarium* spp.
  – *Cylindrocarpon* spp.  – *Thielaviopsis* spp.
• Hosts: Anything and everything
• Environmental trigger: Cool, wet weather

• 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

• 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, mfenoxam, 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
  – 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
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
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