Spring into Gardening

Rusts and Smuts and Poop-on-a-Stick, Oh My!

Diabolical Diseases in the Garden

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Diabolical Diseases in the Garden
Powdery Mildews

• Cause
  – *Erysiphe* spp.
  – *Uncinula* spp.
  – *Phyllactinia* spp.
  – *Blumeria* spp.
  – *Oidium* spp.
  – *Microsphaera* spp.
  – *Sphaerotheca* spp.
  – *Podosphaera* spp.
  – *Brasiliomyces* spp.
  – *Ovulariopsis* spp.

• Hosts: Virtually everything

Diabolical Diseases in the Garden
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

Diabolical Diseases in the Garden
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
Diabolical Diseases in the Garden
Impatiens Downy Mildew

• Cause: *Plasmopara obducens*
• Hosts
  – Standard garden impatiens (*I. walleriana*)
  – Balsam impatiens (*I. balsamina*)
  – Jewelweed (*I. pallida, I. capensis*)
  – New Guinea impatiens (*I. hawkeri*) (resistant/tolerant)

• Control
  – Grow tolerant/resistant/immune plants
  – DO NOT grow impatiens in the same location every year
  – Start with clean transplants and seed
  – Keep materials from different sources physically separated
  – DO NOT overcrowd plants
  – DO NOT overhead water

• Control
  – Watch carefully for the disease
  – Bag and discard affected plants
    • Symptomatic plants
    • Asymptomatic surrounding plants
  – Disinfest contaminated materials
    • 10% bleach
    • 70% alcohol
    • Commercial disinfectants

• Control
  – Use fungicides to prevent infections
    • Mancozeb
    • Apply at 7 day application intervals
Diabolical Diseases in the Garden
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

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Diabolical Diseases in the Garden
Aster Yellows

- **Control**
  - Remove and dispose of infected plants
  - Burn (where allowed)
  - Bury
  - Compost
  - Control leafhopper vector (?)

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Diabolical Diseases in the Garden
Southern Blight

- **Pathogen:** *Sclerotium rolfsii*
- **Hosts**
  - Many other herbaceous annuals and perennials
    - Hosta
    - Bedding plants
  - Some woody ornamentals
Diabolical Diseases in the Garden

**Southern Blight**

- **Control**
  - DO NOT buy infected/infested plants
  - Avoid cocoa mulch (????)
  - Remove infected plants, mulch and soil
    - Double bag
    - Landfill
  - Disinfest contaminated materials
    - 10% bleach
    - 70% alcohol
    - Commercial disinfectants

**Diabolical Diseases in the Garden**

**Common Smut**

- **Cause:** *Ustilago maydis*
- **Host:** Corn

**Diabolical Diseases in the Garden**

**Common Smut**

- **Control**
  - Plant resistant varieties
  - Reduce physical damage to corn plants
  - Give up on your corn and eat the smut

**Diabolical Diseases in the Garden**

**Leaf Streak**

- **Cause:** *Aureobasidium microstictum*
- **Host:** Daylily
**Diabolical Diseases in the Garden**

**Leaf Streak**

- **Control**
  - Remove diseased leaves and plant debris
    - Burn (where allowed)
    - Deep bury
    - Hot compost
  - Promote rapid drying of leaves
    - Divide large clumps
    - Plant less densely
  - DO NOT overhead water

- **Cause:** *Marssonina rosae*
- **Host:** Rose

**Black Spot**

- **Control**
  - Plant resistant rose varieties
  - DO NOT overcrowd plants
  - Prune to thin established plants
  - DO NOT overhead water
  - Remove and destroy infested leaves/canes
    - Burn (where allowed)
    - Deep bury
    - Hot compost
**Diabolical Diseases in the Garden**

**Black Spot**

- **Control**
  - Use fungicides to prevent infections
  - Chlorothalonil, copper-containing fungicides, mancozeb, maneb, myclobutanil, propiconazole, thiophanate-methyl
  - Baking soda (1.5 Tbsp/gal) and light weight horticultural oil (3 Tbsp/gal)
  - Neem oil
  - Alternate active ingredients (FRAC Codes)
  - 7-14 day application interval

**Diabolical Diseases in the Garden**

**“Cedar-Apple” Rusts**

- **Cause:** Gymnosporangium spp.
- **Hosts**
  - Junipers
  - Rosaceous plants: apple, crabapple, hawthorn, quince, pear!

- **Control**
  - Plant only one host
  - 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

**Diabolical Diseases in the Garden**

**Black Knot**

- **Cause:** Apiosporina morbosa
- **Hosts**
  - Plums
  - Cherries
  - Other Prunus species
Diabolical Diseases in the Garden

**Black Knot**

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

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**Tobacco Rattle**

- **Cause:** Tobacco Rattle Virus
- **Hosts**
  - Ornamentals
    - Astilbe, bleeding heart, columbine, coral bells, daffodils, epimedium, gladiolus, hyacinth, marigold, peony, tulip, vinca
  - Vegetables
    - Beans, beet, pepper, potato, spinach

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**Diabolical Diseases in the Garden**

**Tobacco Rattle**

- **Transmission**
  - Stubby-root nematodes
    - *Trichodorus* spp.
    - *Paratrichodorus* spp.
  - Mechanical inoculation
  - Grafting
  - Seed

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**Diabolical Diseases in the Garden**

**Tobacco Rattle**

- **Control**
  - DO NOT buy symptomatic plants
  - Grow non-susceptible plants
    - Annual phlox, carnation, devil’s trumpet (downy thorn-apple), sweet William, zinnia, zombie cucumber
  - Remove and destroy infected plants

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**Diabolical Diseases in the Garden**

**Tobacco Rattle**

- **Control**
  - Disinfect contaminated materials
    - Sodium dodecyl sulfate (sodium lauryl sulfate) + Alconox® (1% + 1%)
    - Trisodium phosphate
    - Alcohol dip followed by flaming
  - DO NOT attempt to control stubby-root nematodes
Diabolical Diseases in the Garden
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