Rhizosphaera Needle Cast

- **Pathogen:** *Rhizosphaera kalkhoffii* (Rhizosphaera sp.)
- **Hosts (major)**
  - Colorado blue spruce
  - Other spruces: Engelmann, black, Serbian, Sitka

- **Hosts (minor)**
  - Pines: Austrian, mugo, eastern white pine
  - Douglas fir
  - Hemlock
  - Balsam fir

- **Favorable environment**
  - Long periods of needle wetness
  - High humidity

- **Control**
  - Do not plant Colorado blue spruce
  - Do not crowd trees when planting
  - Thin healthy branches to increase airflow
  - Prevent tree stress
  - Prune diseased branches

- **Control**
  - Use fungicides to prevent infections
    - Copper-containing fungicides, chlorothalonil
    - Alternate active ingredients (FRAC codes)
    - Bud break
    - 3-4 week application interval under favorable conditions
**Pathogen:** Diplodia pinea (Sphaeropsis sapinea)

- **Hosts (major)**
  - Pines: Austrian
  - Other pines: red, jack, Scots, mugo
- **Hosts (minor)**
  - Other conifers: cedars, cypresses, firs, spruces, junipers, yews

**Favorable environment**
- Long periods of needle wetness
- Drought

**Control**
- DO NOT plant Austrian pines
- Prevent tree stress, particularly water stress
- Thin branches to increase airflow
- Prune diseased branches
- Remove infected cones

**Control**
- Use fungicides to prevent infections
  - Thiophanate methyl, chlorothalonil
  - Alternate active ingredients (FRAC codes)
  - Bud break through shoot elongation
  - 14 day application interval
Top Ten Landscape Diseases
Verticillium Wilt

- **Causes:** *Verticillium dahliae*  
  *Verticillium albo-atrum*
- **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

**Top Ten Landscape Diseases
Verticillium Wilt**

- **Control**
  - Avoid *Verticillium*-infested areas
  - Pretest soils/mulches/composts for the presence of *Verticillium*
  - Fumigate heavily infested soils
  - Keep broad-leaf weeds under control
  - Avoid municipal mulches

**Top Ten Landscape Diseases
Verticillium Wilt**

- **Wood Chips as an Inoculum Source**
  - Amur maple
    - 30.0%/25.0% (Treated)
    - 0.0%/0.0% (Non-Treated)
  - Green Ash
    - 23.7%/10.5% (Treated)
    - 0.0%/0.0% (Non-Treated)
  - Redbud
    - 10.7%/13.3% (Treated)
    - 0.0%/0.0% (Non-Treated)

**Top Ten Landscape Diseases
Verticillium Wilt**

- **Control**
  - Use “resistant” plants
    - CONIFERS: Pines, spruces, firs, junipers
    - DECIDUOUS TREES/SHRUBS: Beech, birch, ginkgo, hackberry, hawthorn, hickory, honey locust, mountain ash, white oak, bur oak, poplar, serviceberry, sycamore, willow
**Top Ten Landscape Diseases**

**Verticillium Wilt**

- **Control**
  - Prevent plant stress
  - Prune diseased (wilted) areas
  - Decontaminate pruning tools
  - Make infected trees comfortable until they die
  - Remove diseased plants
  - Destroy infected materials
  - Composting?

**Top Ten Landscape Diseases**

**Oak Wilt**

- **Cause:** *Ceratocystis fagacearum* (*Chalara* sp.)
- **Hosts**
  - About 20 species of oak
  - Black/red oak group: northern red, northern pin, black
  - White oak group: white, bur, swamp white
  - Chinese chestnut
- **Favorable environment:** Cool, wet conditions

**Top Ten Landscape Diseases**

**Oak Wilt**

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

**Top Ten Landscape Diseases**

**Oak Wilt**

- **Transmission**
  - Root grafts
    - Major method of movement in clumps of oaks
    - Can form between trees in the same subgenus
      - Black/red oak group
      - White oak group
    - Movement of up to 20-25 ft/year
Top Ten Landscape Diseases

**Oak Wilt**

- **Control**
  - DO NOT prune or wound oaks from bud break to 2-3 weeks past full leaf development
  - Disrupt root grafts
    - Mechanically (vibratory plow or trenching machine)
    - Chemically (soil fumigant)
    - Physical barriers
  - Remove diseased (and healthy) trees

- **Causes**
  - Rhytisma americanum
  - Rhytisma acerinum

- **Hosts**
  - Maples

- **Favorable environment**
  - Cool, wet weather

**Tar Spot**

- **Control**
  - DO NOT panic
  - Remove diseased leaves
    - Burn
    - Bury
    - Hot compost
  - Use fungicides to prevent infections
    - Copper-containing fungicides
    - At bud break, 1/2 and full leaf expansion

- **Causes**
  - Erysiphe spp.
  - Uncinula spp.
  - Phyllactinia spp.
  - Blumeria spp.
  - Oidium spp.

- **Hosts**
  - Virtually everything
  - Not conifers

**Powdery Mildews**

- **Causes**
  - Microsphaera spp.
  - Sphaerotheca spp.
  - Podosphaera spp.
  - Brasiliomyces spp.
  - Ovulariopsis spp.

- **Hosts**
  - Virtually everything
  - Not conifers
Matt Hanson, UW-Extension Dodge County

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

Top Ten Landscape Diseases
Powdery Mildews

Powdery Mildews

Causes
- Many and varied
  - Tobacco mosaic virus (TMV)
  - Cucumber mosaic virus (CMV)
  - Impatiens necrotic spot virus (INSV)
  - Hosta virus X (HVX)
  - Tobacco rattle virus (TRV)
- Hosts: Anything and everything

Virus Diseases

Favorable environment: None

Transmission
- Touch (TMV)
- Mechanical injury (HVX)
- Insects (CMV, INSV)
- Nematodes (TRV)
- Grafting
- Seed
Control

- Buy plants from a reputable source
- DO NOT buy symptomatic plants
- Pretest plants for viruses
- Keep weeds under control
- Control vectors (insects)
- DO NOT smoke around your plants
- Remove and destroy infected plants

Top Ten Landscape Diseases

Virus Diseases

Control

- Wash hands routinely
- Disinfest contaminated materials
  - 1% sodium dodecyl sulfate (sodium lauryl sulfate) + 1% Alconox® (2½ Tbsp + 2½ Tbsp/gal)
  - 20% low fat dry milk (Carnation®) + 0.1% polysorbate 20 (9⅛ cups + ¾ tsp/gal)
  - Trisodium phosphate (14 dry oz/gal)
  - Alcohol dip followed by flaming
- DO NOT use chemical controls

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 in terms of weather
- High aster leafhopper populations
Top Ten Landscape Diseases
Aster Yellows

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

Top Ten Landscape Diseases
Leaf Streak

- Cause: *Aureobasidium microstictum*
- Host: Daylily
- Favorable environment: Wet weather

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

Leaf Streak

- 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)
- Favorable environment: Wet weather
Top Ten Landscape Diseases
Impatiens Downy Mildew

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

Top Ten Landscape Diseases
Impatiens Downy Mildew

• Control
  – Watch for disease on a regular basis
  – Bag and discard affected plants
  • Symptomatic plants
  • Asymptomatic surrounding plants
  – Disinfest contaminated materials

Top Ten Landscape Diseases
Impatiens Downy Mildew

• Control
  – Use fungicides to prevent infections
    • Mefenoxam, fluopicolide, potassium phosphite, mancozeb, pyraclostrobin + boscalid, fluoxastobin, cyazofamid, dimethomorph, fenamidone, azoxystrobin
    • Alternate active ingredients (FRAC codes)
    • Apply at 7 day application intervals

Top Ten Landscape Diseases
How to Contact the PDDC

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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