Diseases of Trees and Shrubs

Brian D. Hudelson
Department of Plant Pathology
University of Wisconsin-Madison/Extension

Tar Spot

• Causes: *Rhytisma americanum*  
  *Rhytisma acerinum*
• Hosts: Maples
• Favorable environment: Cool, wet weather

Control
– DO NOT panic
– Remove and destroy diseased leaves
  • Burn (where allowed)
  • Deep bury
  • Hot compost
– Use fungicides to prevent infections
  • Copper-containing fungicides
  • Apply at bud break, 1/2 and full leaf expansion

Scab (Apple and Pear)

• Cause: *Venturia inaequalis* (*V. pirina*)
• Hosts
  – Apple
  – Crabapple
  – Pear
  – Mountain ash
• Favorable environment: Cool, wet weather
Garden Expo 2016
Scab (Apple and Pear)

• Control
  – Plant resistant varieties
  – Remove and destroy diseased leaves
    • Burn (where allowed)
    • Deep bury
    • Hot compost
  – Thin trees to promote air flow

Garden Expo 2016
Scab (Apple and Pear)

• Control
  – Use fungicides to prevent infections
    • Chlorothalonil, copper, mancozeb, myclobutanil, propiconazole, thiophanate-methyl, sulfur
    • Alternate active ingredients (FRAC codes)
    • From bud break through the end of favorable weather
    • Apply at 7-14 day intervals

Garden Expo 2016
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
  – Not conifers

Garden Expo 2016
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

Garden Expo 2016
Powdery Mildews

• Control
  – Use fungicides to prevent infections
    • Dinocap, dithiocarbamates, myclobutanil, triadimefon, triforine, sulfur or thiophanate-methyl
    • Baking soda (1.5 Tbsp/gal) and light weight horticultural oil (3 Tbsp/gal)
    • Alternate active ingredients (FRAC codes)
    • Apply when humidity >60-70%
    • Apply at 7-14 day intervals
• **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)  
  • Apply starting at bud break and at 3-4 week intervals thereafter under favorable conditions

• **Cause:** *Gymnosporangium* spp.

• **Hosts**  
  – Junipers  
  – Woody rosaceous plants  
  (apple, crabapple, hawthorn, quince, pear!)

• **Favorable environment:** Wet weather
**Garden Expo 2016**

**“Cedar-Apple” Rusts**

- **Control**
  - Grow only the juniper or rosaceous host
  - Use resistant cultivars/varieties
  - Remove galls

---

**Cause:** Apiosporina morbosa  
**Hosts**
- *Prunus* species  
- Plums  
- Cherries  
**Favorable environment:** Wet weather

---

**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
**Garden Expo 2016**  
**Diplodia (Sphaeropsis) Shoot Blight**

- **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

**Use fungicides to prevent infections**
- Thiophanate methyl, chlorothalonil
- Alternate active ingredients (FRAC codes)
- Bud break through shoot elongation
- 14 day application interval
**Garden Expo 2016**

**Verticillium Wilt**

- **Causes:** *Verticillium dahliae* (Other species)
- **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

---

**Garden Expo 2016**

**Verticillium Wilt**

- **Control**
  - Avoid *Verticillium*-infested areas
  - Pretest soils/mulches/composts for the presence of *Verticillium*
  - 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

---

**Garden Expo 2016**

**Verticillium Wilt**

- **Control**
  - Keep broad-leaf weeds under control
  - Avoid municipal mulches
  - Prevent plant stress
  - Prune diseased (wilted) areas
  - Decontaminate pruning tools
  - Make infected trees comfortable until they die

---

**Garden Expo 2016**

**Verticillium Wilt**

- **Control**
  - Remove diseased plants
  - Destroy infected materials
    - Burning (where allowed)
    - Landfilling
    - Hot composting?

---

**Garden Expo 2016**

**Chlorosis**

- **Cause:** Micronutrient (Fe or Mn) deficiency
- **Problem trees**
  - Oaks (especially pin oak)
  - Red Maples
  - Rhododendrons
  - Other woody and herbaceous plants can be affected
Garden Expo 2016
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

• Causes
  – Growth regulator herbicides
    • 2,4-D
    • Dicamba
    • Imprelis!
  – Other classes of herbicides

• Affected plants: Anything and everything

Garden Expo 2016
Herbicide Injury

Mark Longstroth
Michigan State University Extension
www.msue.msu.edu/vanburen/f24Dinjr.htm
**Garden Expo 2016**

**Herbicide Injury**

- **Control**
  - Apply herbicides only when needed
  - Follow application directions exactly
  - Apply herbicides only when wind speed is low (< 5 mph)
  - DO NOT apply herbicides too close to nontarget plants
  - Apply herbicides at low pressure

---

**Garden Expo 2016**

**Herbicide Injury**

- **Control**
  - Use amine rather than ester forms of herbicides
  - Adequately test herbicides prior to registration!

---

**Garden Expo 2016**

**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 on Twitter @UWPDDC*