2016 Plant Disease Update

Winter Injury/Winter Burn

• Causes
  – Water stress
  – Extreme winter conditions (cold and wind)
  – Excessive salt use

• Affected plants
  – Evergreens (yews and boxwoods)
  – Fruit trees
  – Redbud

2016 Plant Disease Update

“Boxwood Dieback”

• Causes
  – Winter injury/winter burn
  – Small animal injury
  – Fungal pathogens
    • Verticillium sp. (Verticillium wilt)
    • Phytophthora sp., Pythium sp., Rhizoctonia sp. (root rots)
    • Volutella buxi (Volutella blight)
    • Cylindrocladium pseudonaviculatum (box blight)
      (Cylindrocladium buxicola)

• Host: Boxwood
2016 Plant Disease Update
“Boxwood Dieback”

• Control
  – Produce and use cold hardy varieties
    • ‘Green Gem’
    • ‘Green Mound’
    • ‘Glencoe’ (Chicagoland Green®)
    • ‘Wilson’ (Northern Charm™)
  – Water adequately
  – Reduce stress
  – Control small animal populations

2016 Plant Disease Update
“Boxwood Dieback”

• Control
  – Be cautious when buying boxwood from areas with reported box blight
  – Inspect new plants for symptoms
  – Keep new plants isolated
  – Physically separate boxwood plantings
  – Space plants far apart
  – DO NOT overhead water

2016 Plant Disease Update
“Boxwood Dieback”

• Control
  – Prune out diseased branches
  – Disinfect pruning tools
    • 70% alcohol
    • 10% bleach
    • Commercial disinfectants
  – Remove and destroy infected plants
    • Burn (where allowed)
    • Haul to your local municipal composting site

2016 Plant Disease Update
“Boxwood Dieback”

• Control
  – Hospice method of disease management
  – Use fungicides treatments
    • Chlorothalonil, mancozeb, thiophanate-methyl
    • 7 day application intervals
    • Alternate active ingredients (FRAC codes)
  – Contact the PDDC if you believe you have found box blight!

2016 Plant Disease Update
Verticillium Wilt

• Causes
  – Increasingly long list of Verticillium spp.
  – Verticillium dahliae
  – Verticillium albo-atrum

2016 Plant Disease Update
Verticillium Wilt

• Hosts
  – Many woody ornamentals
    • Common: Maple, ash, redbud, smokebush, catalpa
    • “New”: Seven son flower, wafer-ash, buttonbush, Eastern leatherwood
  – Many herbaceous plants
  – Many vegetables
    • Solanaceous vegetables: tomato, potato, eggplant
    • Cucurbits: cucumber, squash, pumpkin
Favorable environment
– Cool, wet weather (for infection)
– Hot, dry weather (for symptom expression)

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

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

Control
– Prevent plant stress
– Prune diseased (wilted) areas
– Decontaminate pruning tools
  • 70% alcohol
  • 10% bleach
  • Commercial disinfectants
– Hospice method of disease management

Control
– Remove diseased plants
– Destroy infected materials
  • Burn (where allowed)
  • Compost infested materials (?)
  • DO NOT bury
2016 Plant Disease Update

**Anthracnose**

- **Causes**
  - Many fungi
  - *Gloeosporium* spp.
  - *Discula* spp.
  - *Collectotrichum* spp.

- **Hosts**
  - Anything and everything
  - Ash, maple, oak
  - Sycamore

- **Environmental trigger**
  - Cool, moist conditions in May/June

- **Control**
  - DO NOT panic
  - Remove diseased leaves
  - Use fungicides to prevent infections
    - Copper-containing fungicides, chlorothalonil, mancozeb, thiophanate-methyl
    - 3 applications at bud break, 1/2 expansion of leaves, full leaf expansion

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**Tomato Leaf Blights**

- **Causes**
  - *Alternaria solani* (early blight)
  - *Septoria lycopersici* (Septoria leaf spot)
  - *Phytophthora infestans* (late blight)

- **Hosts**
  - Tomato
  - Potato (early blight, late blight)

- **Environmental trigger:** Wet weather
2016 Plant Disease Update
Tomato Leaf Blights

• Control (early blight, Septoria leaf spot)
  – Remove and destroy infested debris
  – Move tomatoes to new location (?)
  – Plant resistant varieties (?)
  – Space plants far apart
  – Mulch around the base of plants
  – DO NOT over-mulch

2016 Plant Disease Update
Tomato Leaf Blights

• Control (late blight)
  – Remove infected plants
    • Leaves, stems, fruits, roots, tubers
    • Volunteer tomato and potato plants
    • Weed hosts
  – Destroy infected plants
    • Double bag
    • Landfill
  – DO NOT use last year’s potatoes as seed

2016 Plant Disease Update
Tomato Leaf Blights

• Control (late blight)
  – Use fungicides to prevent infections
    • Copper, chlorothalonil
    • Start applications based on Blitecast
      (http://www.plantpath.wisc.edu/wivegdis/)
    • Apply every 7-14 days

2016 Plant Disease Update
Tomato Leaf Blights

• Control (early blight, Septoria leaf spot)
  – DO NOT overhead water
  – Thin plants/remove healthy leaves
  – Remove diseased leaves
  – Use fungicides to prevent infections
    • Copper, chlorothalonil
    • Applications every 7-14 days

• Control (late blight)
  – DO use certified seed potatoes
  – Grow resistant tomato varieties
    • “Late Blight Management in Tomato with Resistant Varieties”

2016 Plant Disease Update  
**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)
- **Environmental trigger:** Wet weather

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2016 Plant Disease Update  
**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

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2016 Plant Disease Update  
**Impatiens Downy Mildew**

- **Control**
  - Watch for disease on a regular basis
  - Bag and discard affected plants
    - Symptomatic plants
    - Asymptomatic surrounding plants
  - **Disinfect** contaminated materials
    - 10% bleach
    - 70% alcohol
    - Commercial disinfectants

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2016 Plant Disease Update  
**Impatiens Downy Mildew**

- **Control**
  - Use fungicides to prevent infections
    - Mancozeb
    - Apply at 7 day application intervals
Brown Rot

**Causes**
- *Monilinia fructicola*
- *Monilinia laxa*
- *Monilinia fructigena*

**Hosts**
- Stone fruits (apricot, cherry, peach, plum)
- Apple, pear

**Environmental trigger:** Wet weather

**Control**
- Remove mummified fruits
- Prune out diseased/dead branches
- Remove volunteer stone fruit trees/shrubs
- Dispose of contaminated plant materials
  - Burning (where allowed)
  - Burying
  - Prune healthy branches to increase air flow
- Decontaminate pruning tools
  - 10% bleach
  - 70% alcohol
- DO NOT overhead water
- Carefully handle fruits at harvest
- Use fungicides to prevent infections
  - Captan, myclobutanil, propiconazole
  - Apply at 10% flower (flower infections)
  - Apply 3 weeks prior to harvest (fruit infections)
  - Alternate active ingredients (FRAC codes)
- Manage insects that injure fruit

Virus Diseases

**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
2016 Plant Disease Update

*Virus Diseases*

• **Environmental trigger:** None

• **Transmission**
  – Touch (TMV)
  – Mechanical injury (HVX)
  – Insects (CMV, INSV)
  – Nematodes (TRV)
  – Grafting
  – Seed

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**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

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2016 Plant Disease Update

*Virus Diseases*

• **Cause:** Geosmithia morbida
• **Hosts**
  – Black walnut
  – Other walnuts
• **Environmental trigger:** None
• **Transmission**
  – Walnut twig beetle
  *Pityophthorous juglandis*

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**Control**

– Wash hands routinely
– Disinfect 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
2016 Plant Disease Update

**Thousand Cankers Disease**

- **Control**
  - DO NOT transport walnut wood/products from areas known to have the disease
  - Remove and destroy affected trees (burn)
  - No effective fungicide strategies known
  - No effective insecticide strategies known
  - Contact the PDDC if you believe you have found this disease!

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**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