Top Ten Plant Diseases of 2023

Planting-Related Decline

- Causes
  - Impatience
  - Improper planting techniques
    - Overly deep planting
    - Failure to remove burlap, wire basket, wires
    - Lack of watering post installation
- Hosts: Any tree or shrub

Management
- Plant small trees
- Plant bare-root trees
- Prepare balled and burlaped trees properly
  - Remove burlap
  - Remove wire basket
  - Remove wires/cords
  - Expose the root flare
- Mulch properly
  - Use high quality mulches
  - Use the right amount of mulch
- Water properly
  - Apply two inches of water per week
  - Water from bud break through summer and into the fall
  - Continue watering for at least three years
Top Ten Plant Diseases of 2023
Chlorosis

• Cause: Micronutrient (Fe or Mn) deficiency
• Affected plants
  – Oaks (especially pin oak)
  – Red maple
  – Rhododendron
  – White pine
  – Blueberries
  – Other woody (and herbaceous) plants

Top Ten Plant Diseases of 2023
Chlorosis

• Management
  – 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

Top Ten Plant Diseases of 2023
Powdery Mildews

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

• Hosts: Virtually anything
• Favorable environment: High humidity
### Top Ten Plant Diseases of 2023
#### 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

- **Pathogen:** *Erwinia amylovora*
- **Hosts**
  - Many woody rosaceous plants
  - Apple, crabapple, pear, mountain ash, cotoneaster
- **Favorable environment**
  - Wet weather (but not too wet)
  - Hail (or other wounding)

- **Control**
  - Use fungicides to prevent infections
    - Dithiocarbamates, myclobutanil, propiconazole, tebuconazole, thiophanate-methyl
    - Sulfur, neem oil, other plant-based oils
    - 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

- **Control**
  - Decontaminate pruning tools (70% alcohol, disinfectants, bleach)
  - Destroy infected materials
    - Burn (where allowed)
    - Deep bury
  - DO NOT over-fertilize with nitrogen

- **Control**
  - Plant resistant varieties
    - “Home Fruit Cultivars for Northern Wisconsin” ([https://learningstore.extension.wisc.edu/](https://learningstore.extension.wisc.edu/))
    - “Home Fruit Cultivars for Southern Wisconsin” ([https://learningstore.extension.wisc.edu/](https://learningstore.extension.wisc.edu/))
    - “Top Ornamental Crabapples for Wisconsin” ([https://hort.extension.wisc.edu/](https://hort.extension.wisc.edu/))
  - Prune diseased branches

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### Fire Blight

- **Pathogen:** *Erwinia amylovora*
- **Hosts**
  - Many woody rosaceous plants
  - Apple, crabapple, pear, mountain ash, cotoneaster
- **Favorable environment**
  - Wet weather (but not too wet)
  - Hail (or other wounding)

- **Control**
  - Prune diseased branches
  - Decontaminate pruning tools (70% alcohol, disinfectants, bleach)
  - Destroy infected materials
    - Burn (where allowed)
    - Deep bury
  - DO NOT over-fertilize with nitrogen

- **Control**
  - Plant resistant varieties
    - “Home Fruit Cultivars for Northern Wisconsin” ([https://learningstore.extension.wisc.edu/](https://learningstore.extension.wisc.edu/))
    - “Home Fruit Cultivars for Southern Wisconsin” ([https://learningstore.extension.wisc.edu/](https://learningstore.extension.wisc.edu/))
    - “Top Ornamental Crabapples for Wisconsin” ([https://hort.extension.wisc.edu/](https://hort.extension.wisc.edu/))
  - Prune diseased branches
**Top Ten Plant Diseases of 2023**

**Fire Blight**

- **Control**
  - Use bactericides to prevent infections (?)
  - Copper, streptomycin
  - Apply
    - Pre-bloom (copper)
    - During flowering (streptomycin)
  - Apply
    - Two applications at spaced 4 days apart (copper)
    - Multiple applications spaced 3-4 days apart (streptomycin)

**Bacterial Canker**

- **Pathogens**
  - *Pseudomonas syringae pv. syringae*
  - *Pseudomonas syringae pv. mors-prunorum*
- **Hosts:** Stone fruits (plum, cherry, peach)
- **Favorable environment**
  - Wet weather
  - Cold temperatures
  - Wounding

**Blister Canker**

- **Pathogen:** *Biscogniauxia marginata*
- **Hosts**
  - Select woody rosaceous plants
  - Apple, crabapple, serviceberry
- **Favorable environment:** Hot, dry weather
**Top Ten Plant Diseases of 2023**

**Blister Canker**

- **Control**
  - Reduce stress
  - Water appropriately
  - Fertilize as needed
  - Prune diseased branches
  - Remove diseased trees
  - Decontaminate pruning tools (70% alcohol, disinfectants, bleach)

- **Control**
  - Destroy infected materials
  - Burn (where allowed)
  - Deep bury
  - DO NOT use fungicides for control

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**Top Ten Plant Diseases of 2023**

**“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*)
    - *Calonectria pseudonaviculata* (boxwood blight)
      (Cylindrocladium pseudonaviculatum)
  - **Host**: Boxwood

- **Control**
  - Grow boxwood blight resistant varieties
    - Hybrid boxwood
      - ‘Green Gem’
      - ‘Karzgreen’ (Green Ice®)
    - Japanese littleleaf boxwood
      - ‘Jim Stauffer’
      - ‘Little Missy’
      - ‘Winter Gem’
# Top Ten Plant Diseases of 2023

## “Boxwood Dieback”

### Control
- Grow boxwood resistant varieties
  - Korean littleleaf boxwood
    - ‘Eseles’ (Wedding Ring®)
    - ‘Franklin’s Gem’
    - ‘Pincushion’
    - ‘Wee Willie’
    - ‘Winter Beauty’
    - ‘Wintergreen’

## “Boxwood Dieback”

### Control
- Inspect new plants for symptoms
- Keep new plants isolated
- Space plants far apart
- DO NOT overhead water

## “Boxwood Dieback”

### Control
- Prune out diseased branches
- Disinfest pruning tools
  (70% alcohol, disinfectants, bleach)
- Remove and destroy infected plants
  - Burn (where allowed)
  - Haul to your local municipal composting site

## “Boxwood Dieback”

### Control
- 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 boxwood blight!

## Oak Wilt

### Pathogen
- *Bretziella fagacearum*  
  (*Ceratocystis fagacearum*)
- *Chalara* sp.

### Hosts
- Red oak group: Red, black, pin
- White oak group: White, bur, swamp white
- Chinese chestnut

### Favorable environment
- Cool, wet conditions (for infection)
- Hot, dry weather (for symptom development)
Top Ten Plant Diseases of 2023
Oak Wilt

Look-Alike: Two-Lined Chestnut Borer

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

- Transmission
  - Root grafts
    - Major method of movement in clumps of oaks
    - Commonly form between trees in the same group
      - Red oak group: Red, black, pin
      - White oak group: White, bur, swamp white
    - Rarely form between trees in different groups
    - Movement of up to 20-25 ft/year

Look-Alike: Armillaria Root Disease
Top Ten Plant Diseases of 2023

Oak Wilt

• Control
  – DO NOT prune or wound oaks from bud break through 2-3 weeks past full leaf development
  – Disrupt root grafts
    • “Oak Wilt Management: Testing and Other Techniques” (https://widnr.widen.net/s/nwf2cgskdn/fr-825-oak-wilt-management-fact-sheet)
    • Mechanically (vibratory plow or trenching machine)
    • Chemically (soil fumigant)
    • Physical barriers

Top Ten Plant Diseases of 2023

Oak Wilt

• Control
  – Remove diseased (and healthy) trees
  – Decontaminate pruning tools
    (70% alcohol, disinfectants, bleach)
  – Be careful using oak wood
    • Remove bark
    • Cover wood

Top Ten Plant Diseases of 2023

Verticillium Wilt

• Pathogens
  – Verticillium dahliae
  – Verticillium albo-atrum
  – Other Verticillium spp.
  – New Verticillium spp.

Top Ten Plant Diseases of 2023

Verticillium Wilt

• Hosts
  – Many woody ornamentals
    • Common: Maple, ash, redbud, smokebush
    • Newer: Seven son flower, wafer-ash, buttonbush
  – Many vegetables
    • Tomato, potato, pepper, EGGPLANT, cucurbits
  – Many herbaceous plants
    • Common: Purple coneflower, blazing star
    • New: Vervain (‘Quartz White’)

Top Ten Plant Diseases of 2023

Verticillium Wilt

• Favorable environment
  – Cool, wet weather (for infection)
  – Hot, dry weather (for symptom development)
**Top Ten Plant Diseases of 2023**

**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
  - Clean up leaf litter
  - Avoid municipal mulches

- **Pathogen:** *Erwinia tracheiphila*
- **Hosts:** Cucurbits (cucumber, squash, pumpkin)
- **Favorable environment:** None
- **Transmission:** Cucumber beetles

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**Bacterial Wilt**

- **Control**
  - Decontaminate pruning tools (70% alcohol, disinfectants, bleach)
  - Make plants comfortable until they die
  - Remove and destroy diseased plants/leaves
  - Burn (where allowed)
  - Hot compost (?)
  - DO NOT use fungicides
• Control
  – Use floating row covers
  – Apply insecticides to control cucumber beetles
  – Remove infected plants
  – If you decide to keep infected plants, water them adequately
  – DO NOT use bactericides