2024 PDDC Plant Disease Talks

Top Ten Plant Diseases of 2023

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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

Top Ten Plant Diseases of 2023
Planting-Related Decline

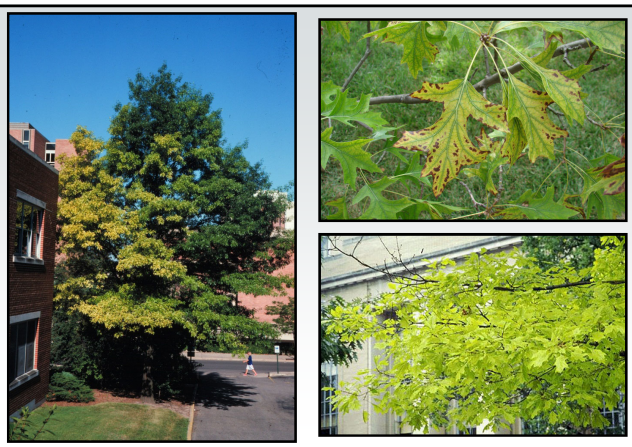
- Management
  - Plant small trees
  - Plant bare-root trees
  - Prepare balled and burlaped trees properly
    - Remove burlap
    - Remove wire basket
    - Remove wires/cords
    - Expose the root flare

Top Ten Plant Diseases of 2023
Planting-Related Decline

- Management
  - 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

Top Ten Plant Diseases of 2023
Powdery Mildews

- 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

Top Ten Plant Diseases of 2023
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)

Top Ten Plant Diseases of 2023
Fire Blight

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

Top Ten Plant Diseases of 2023
Fire Blight

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

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)

Top Ten Plant Diseases of 2023
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

Top Ten Plant Diseases of 2023
Bacterial Canker

- Control
  - Minimize wounding
  - Prune diseased branches
  - Decontaminate pruning tools (70% alcohol, disinfectants, bleach)
  - Destroy infected materials
    - Burn (where allowed)
    - Deep bury
  - DO NOT use bactericides

Top Ten Plant Diseases of 2023
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)

Top Ten Plant Diseases of 2023
Blister Canker

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

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

Top Ten Plant Diseases of 2023
"Boxwood Dieback"

- Control
  - Water adequately
    - Apply one inch of water per week
    - Water from bud break through summer and into the fall up until ground freeze/snow
  - Protect plants from winter winds
  - Reduce other stresses
  - Control small animal populations

Top Ten Plant Diseases of 2023
"Boxwood Dieback"

- 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'

Top Ten Plant Diseases of 2023
"Boxwood Dieback"

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

Top Ten Plant Diseases of 2023
"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

Top Ten Plant Diseases of 2023
"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!

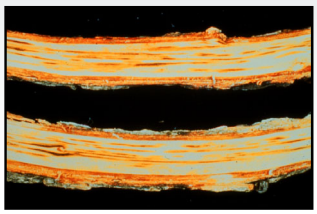
Top Ten Plant Diseases of 2023
Oak Wilt

- Pathogen
  - *Bretziella fagacearum* (*Ceratocystis fagacearum*)
  - *Chalara* sp.
- Hosts
  - Red oak group: Red, black, pin
  - White oak group: White, bur, swamp white
  - Chinese chestnut

Top Ten Plant Diseases of 2023
Oak Wilt

- Favorable environment
  - Cool, wet conditions (for infection)
  - Hot, dry weather (for symptom development)





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




Top Ten Plant Diseases of 2023
Oak Wilt
Look-Alike: Two-Lined Chestnut Borer





Top Ten Plant Diseases of 2023
Oak Wilt

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

Top Ten Plant Diseases of 2023
Oak Wilt

- **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**




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
Oak Wilt

- Control
  - Use fungicide injections
    - Propiconazole
    - Prophylactic or therapeutic
    - Inject every 12-24 months

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

Top Ten Plant Diseases of 2023
Verticillium Wilt

- Control
  - Use immune/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
  - Prevent stress
  - Prune diseased (wilted) areas

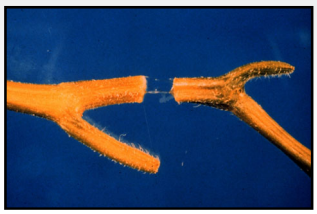
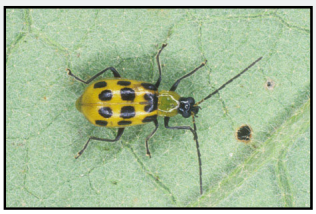
Top Ten Plant Diseases of 2023
Verticillium Wilt

- 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

Top Ten Plant Diseases of 2023
Bacterial Wilt

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



Top Ten Plant Diseases of 2023
Bacterial Wilt

- **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**

Top Ten Plant Diseases of 2023
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@wisc.edu
https://pddc.wisc.edu
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