

Talks for the General Public

Top Ten Plant Diseases of 2021

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



Top Ten Plant Diseases of 2021 Drought Stress

- Cause: Insufficient rain
- Hosts: Anything and everything



Top Ten Plant Diseases of 2021 Drought Stress

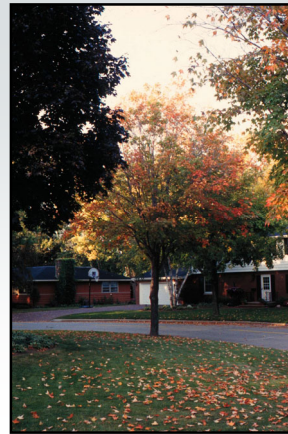
- Management
 - Water properly
 - Use a soaker or drip hose
 - Apply one inch per week (established plants)
 - Apply two inches per week (recent transplants)
 - Water from bud break through summer and into the fall

Top Ten Plant Diseases of 2021 Drought Stress

- Management
 - Mulch properly
 - Use a high quality mulch
 - Use the right amount
 - One to two inches (heavier soils)
 - Three to four inches (lighter soils)
 - DO NOT mulch too close to trunks

Top Ten Plant Diseases of 2021 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 2021 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 2021 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 2021 Septoria Leaf Spot

- **Pathogen: *Septoria* sp.**
- **Host: Lilac**
- **Favorable environment: Wet weather**



Top Ten Plant Diseases of 2021 Septoria Leaf Spot

- **Control**
 - Space lilacs to promote good air flow
 - Routinely thin shrubs
 - Decontaminate pruning tools (70% alcohol, disinfectants, bleach)
 - Avoid overhead watering
 - Reduce stress

Top Ten Plant Diseases of 2021 Septoria Leaf Spot

- **Control**
 - Destroy infected materials
 - Burn (where allowed)
 - Deep bury
 - Hot compost
 - Use fungicides to prevent infections
 - Chlorothalonil, copper, mancozeb
 - Apply from bud break through the end of favorable weather
 - Apply at 7 to 14-day intervals

Top Ten Plant Diseases of 2021 “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* (box blight)
(*Cylindrocladium pseudonaviculatum*)
- **Host: Boxwood**



Top Ten Plant Diseases of 2021 “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 2021 “Boxwood Dieback”

- **Control**
 - Grow boxwood blight resistant varieties
 - Hybrid boxwood ‘Green Gem’
 - Common boxwood ‘Katerberg’ North Star®
 - Korean littleleaf boxwood
 - ‘Eseles’ Wedding Ring®
 - ‘Franklin’s Gem’
 - ‘Winter Gem’
 - ‘Wintergreen’

Top Ten Plant Diseases of 2021 “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 2021 “Boxwood Dieback”

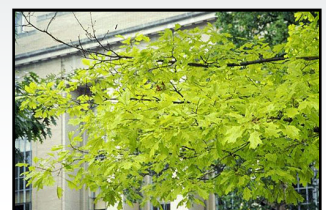
- **Control**
 - Prune out diseased branches
 - Disinfest pruning tools
(70% alcohol, disinfectants, bleach)
 - Remove and destroy infected plants
 - Burn (where allowed)
 - Haul to your local municipal composting site

Top Ten Plant Diseases of 2021 “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 2021 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 2021 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 2021 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 2021 Oak Wilt

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



Top Ten Plant Diseases of 2021 Oak Wilt Look-Alike: Armillaria Root Disease



Top Ten Plant Diseases of 2021

Oak Wilt

Look-Alike: Two-Lined Chestnut Borer



Top Ten Plant Diseases of 2021

Oak Wilt

• Transmission

– Oak bark beetles

- *Pseudopityophthorus minutissimus*
- *Pseudopityophthorus pruinosis*

– Sap beetles

- *Carpophilus* spp.
- *Colopterus* spp.
- *Cryptarcha* spp.
- *Epuraea* spp.
- *Clischrochilus* spp.

Top Ten Plant Diseases of 2021

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 2021

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: What are the Options?” (<https://learningstore.extension.wisc.edu/>)
 - Mechanically (vibratory plow or trenching machine)
 - Chemically (soil fumigant)
 - Physical barriers

Top Ten Plant Diseases of 2021

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 2021 Oak Wilt

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

Top Ten Plant Diseases of 2021 Fire Blight

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



Top Ten Plant Diseases of 2021 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 2021 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 2021 Fire Blight

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

Top Ten Plant Diseases of 2021 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 2021 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 2021 Powdery Mildews

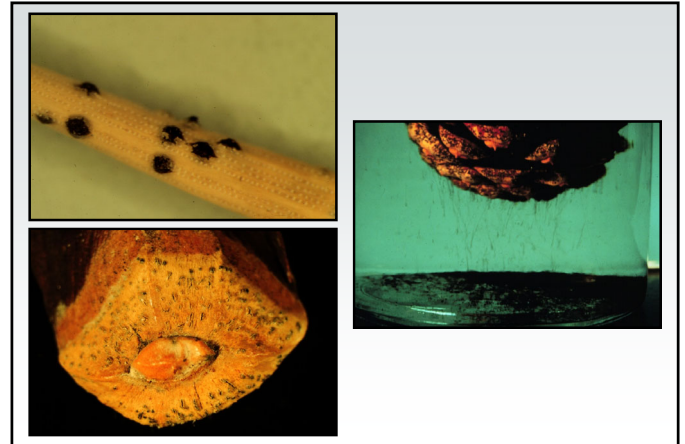
- **Control**
 - Use fungicides to prevent infections
 - Dithiocarbamates, myclobutanil, propiconazole, tebuconazole, thiophanate-methyl
 - Sulfur, neem oil, other plant-based oils
 - Baking soda (1.5 Tbsp/gal) and light weight horticultural oil (3 Tbsp/gal)
 - Alternate active ingredients (FRAC Codes)
 - Apply when humidity >60-70%
 - Apply at 7-14 day intervals

Top Ten Plant Diseases of 2021 Diplodia (Sphaeropsis) Tip Blight

- **Pathogens:** *Diplodia* spp.
(*Sphaeropsis* spp.)
- **Hosts (major)**
 - Austrian pine
 - Other pines: red, jack, Scots, mugo
- **Hosts (minor)**
 - Other conifers: cedars, cypresses, firs, spruces, junipers, yews

Top Ten Plant Diseases of 2021 Diplodia (Sphaeropsis) Tip Blight

- **Favorable environment**
 - Wet weather (for infection)
 - Drought (for extensive colonization)



Top Ten Plant Diseases of 2021 Diplodia (Sphaeropsis) Tip Blight

- **Control**
 - DO NOT plant Austrian pines
 - Prevent tree stress, particularly water stress
 - Thin branches to increase airflow
 - Prune diseased branches
 - Decontaminate pruning tools (70% alcohol, disinfectants, bleach)
 - Remove infected cones (?)

Top Ten Plant Diseases of 2021 Diplodia (Sphaeropsis) Tip Blight

- **Control**
 - Use fungicides to prevent infections
 - Thiophanate-methyl, chlorothalonil
 - Alternate active ingredients (FRAC Codes)
 - Apply from bud break through shoot elongation
 - Apply at 14 day intervals

Top Ten Plant Diseases of 2021 Rhizosphaera Needle Cast

- **Pathogens:** *Rhizosphaera kalkhoffii*
Rhizosphaera spp.
- **Look-Alike:** Stigma Needle Cast (*Stigma* spp.)
- **Hosts (major)**
 - Colorado blue spruce
 - Other spruces: Black, Engelmann, Serbian, Sitka, white (Black Hills)

Top Ten Plant Diseases of 2021 Rhizosphaera Needle Cast

- **Hosts (minor)**
 - Pines: Austrian, mugo, eastern white pine
 - Douglas fir
 - Hemlock
 - Balsam fir and other firs
- **Favorable environment**
 - Wet weather
 - High humidity



Top Ten Plant Diseases of 2021 **Rhizosphaera Needle Cast**

- **Control**
 - DO NOT plant Colorado blue spruce
 - DO NOT crowd trees when planting
 - Plant dwarf spruce varieties
 - Thin healthy branches to increase airflow
 - Prevent tree stress
 - Prune diseased branches

Top Ten Plant Diseases of 2021 **Rhizosphaera Needle Cast**

- **Control**
 - Decontaminate pruning tools
(70% alcohol, disinfectants, bleach)
 - Use fungicides to prevent infections
 - Copper, chlorothalonil
 - Alternate active ingredients (FRAC Codes)
 - Start applications at bud break
 - Apply at 3-4 week intervals under favorable conditions

Top Ten Plant Diseases of 2021 **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>
 Follow on Facebook and Twitter @UWPDDC
 Subscribe to the PDDC Listserv: UWPDDCLearn