2023 PDDC Plant Disease Talks

Dr. Death's Plant Disease Predictions for 2023

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

Dr. Death's Plant Disease Predictions
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**

Dr. Death's Plant Disease Predictions
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**

Dr. Death's Plant Disease Predictions
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**

Dr. Death's Plant Disease Predictions
Gymnosporangium Rusts

- Pathogens: *Gymnosporangium* spp.
  - *Gymnosporangium juniperi-virginianae* (Cedar-apple rust)
  - *Gymnosporangium globosum* (Cedar-hawthorn rust)
  - *Gymnosporangium clavipes* (Cedar-quince rust)
  - *Gymnosporangium yamadae* – NEW! (Lipstick rust/Japanese apple rust)

Dr. Death's Plant Disease Predictions
Gymnosporangium Rusts

- Hosts
  - Junipers
  - Rosaceous plants
    - Apple, crabapple
    - Hawthorn
    - Quince
    - Pear
    - Serviceberry
- Favorable environment: Wet weather

Dr. Death's Plant Disease Predictions
Gymnosporangium Rusts

- Control
  - Grow only junipers or rosaceous hosts
  - Use resistant cultivars/varieties
    - "Juniper Diseases" (Available upon request)
    - "Disease and Insect Resistant Ornamental Plants: Juniperus (Junipers)" (https://ecommons.cornell.edu/handle/1813/56372.2)

Dr. Death's Plant Disease Predictions
Gymnosporangium Rusts

- Control
  - Use resistant cultivars/varieties
    - "Home Fruit Cultivars for Northern Wisconsin" (https://learningstore.extension.wisc.edu/)
    - "Home Fruit Cultivars for Southern Wisconsin" (https://learningstore.extension.wisc.edu/)

Dr. Death's Plant Disease Predictions
Gymnosporangium Rusts

- Control
  - Remove galls
  - Decontaminate pruning tools (70% alcohol, disinfectants, bleach)
  - Destroy infected materials
    - Burn (where allowed)
    - Deep bury

Dr. Death's Plant Disease Predictions
Gymnosporangium Rusts

- Control
  - Use fungicides to prevent infections (?)
    - Treat rosaceous hosts
    - Chlorothalonil, copper, ferbam, mancozeb, propiconazole, sulfur, and triadimefon
    - Alternate active ingredients (FRAC Codes)
    - Apply when flowers first show color, when half of flowers open, at petal fall, 7 to 10 days after petal fall, and 10 to 14 days later

Dr. Death's Plant Disease Predictions
Boxwood Blight

- Pathogen
  - *Calonectria pseudonaviculata*
  - *Cylindrocladium pseudonaviculatum* (*Cyindrocladium buxicola*)
- Hosts
  - Boxwood
  - Pachysandra
- Favorable Environment: Cool, wet weather

Dr. Death's Plant Disease Predictions
Boxwood Blight

- Control
  - Be cautious about holiday wreaths
  - Grow shrubs other than boxwood
  - Buy from a reputable supplier
  - Buy locally produced boxwood

Dr. Death's Plant Disease Predictions
Boxwood Blight

- Control
  - Grow resistant varieties
    - Hybrid boxwood
      - 'Green Gem'
      - 'Karzgreen' (Green Ice®)
    - Japanese littleleaf boxwood
      - 'Jim Stauffer'
      - 'Little Missy'
      - 'Winter Gem'

Dr. Death's Plant Disease Predictions
Boxwood Blight

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

Dr. Death's Plant Disease Predictions
Boxwood Blight

- Control
  - DO NOT replant in an area where boxwood blight has been a problem
  - Avoid symptomatic plants
  - Keep new plants isolated
  - Space plants far apart
  - DO NOT overhead water

Dr. Death's Plant Disease Predictions
Boxwood Blight

- Control
  - Prune out diseased branches
  - Decontaminate (70% alcohol, commercial disinfectants)
  - Remove and destroy infected plants
    - Burn (where allowed)
    - Deep bury (two feet)/Double bag and landfill
    - DO NOT compost

Dr. Death's Plant Disease Predictions
Boxwood Blight

- Control
  - Use fungicides to prevent infections
    - Chlorothalonil (alone or with propiconazole or thiophanate-methyl), fludioxonil, metconazole, tebuconazole
    - Alternate active ingredients (FRAC codes)
    - Apply at 7 day intervals

Dr. Death's Plant Disease Predictions
Septoria Leaf Spot

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

Dr. Death's Plant Disease Predictions
Septoria Leaf Spot

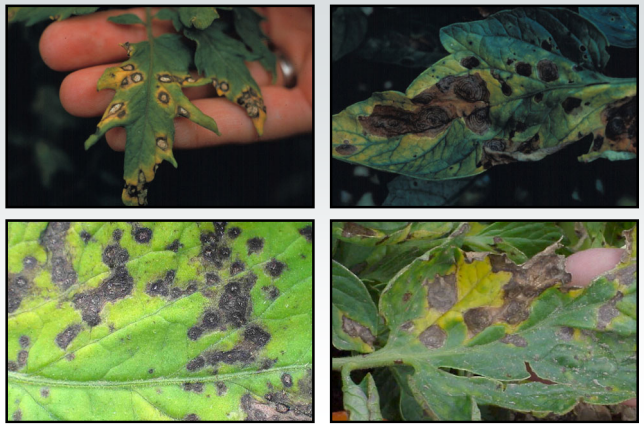
- Control
  - Space lilacs to promote good air flow
  - Routinely thin shrubs
  - Decontaminate pruning tools (70% alcohol, disinfectants, bleach)
  - Avoid overhead watering
  - Reduce stress

Dr. Death's Plant Disease Predictions
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

Dr. Death's Plant Disease Predictions
Tomato Leaf Blights

- Pathogens
  - *Septoria lycopersici* (Septoria leaf spot)
  - *Alternaria solani* (early blight)
  - *Phytophthora infestans* (late blight)
- Hosts
  - Tomato
  - Potato (early blight, late blight)
- Favorable environment: Cool, wet weather



Dr. Death's Plant Disease Predictions
Tomato Leaf Blights

- Control (early blight, Septoria leaf spot)
  - Remove and destroy contaminated debris
    - Burn (where allowed)
    - Deep bury
    - Hot compost
  - Move tomatoes to new location

Dr. Death's Plant Disease Predictions
Tomato Leaf Blights

- Control (early blight, Septoria leaf spot)
  - Plant resistant varieties
  - Space plants far apart
  - Mulch around the base of plants
  - DO NOT overmulch

Dr. Death's Plant Disease Predictions
Tomato Leaf Blights

- Control (early blight, Septoria leaf spot)
  - DO NOT overhead water
  - Thin plants as they grow
  - Use fungicides to prevent infections
    - Chlorothalonil, mancozeb
    - Copper
    - Alternate active ingredients (FRAC codes)
    - Apply at 7-14 days intervals

Dr. Death's Plant Disease Predictions
Tomato Leaf Blights

- Control (late blight)
  - Remove any infected plants and plant parts
    - Infected tomato/potato plants including fruits and tubers
    - Volunteer tomato and potato plants
    - Weed hosts
  - Destroy any infected plants and plant parts
    - Burn (where allowed)
    - Double bag and landfill

Dr. Death's Plant Disease Predictions
Tomato Leaf Blights

- Control (late blight)
  - DO NOT use last year's potatoes as seed
  - DO use certified seed potatoes
  - Grow resistant tomato varieties
    - "Late Blight Management in Tomato with Resistant Varieties" (https://eorganic.org/node/10822)

Dr. Death's Plant Disease Predictions
Tomato Leaf Blights

- Control (late blight)
  - Use fungicides to prevent infections
    - Chlorothalonil, mancozeb
    - Copper
    - Alternate active ingredients (FRAC codes)
    - Start applications based on Blitecast (https://wisconsinpotatoes.com/blog-news/)
    - Apply at 7-14 day intervals

Dr. Death's Plant Disease Predictions
Verticillium Wilt

- Pathogens
  - *Verticillium dahliae*
  - *Verticillium albo-atrum*
  - Other *Verticillium* spp.
  - New *Verticillium* spp.

Deciduous Tree and Shrub Diseases
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
    - Newer: Vervain ('Quartz White')

Deciduous Tree and Shrub Diseases
Verticillium Wilt

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

Deciduous Tree and Shrub Diseases
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

Deciduous Tree and Shrub Diseases
Verticillium Wilt

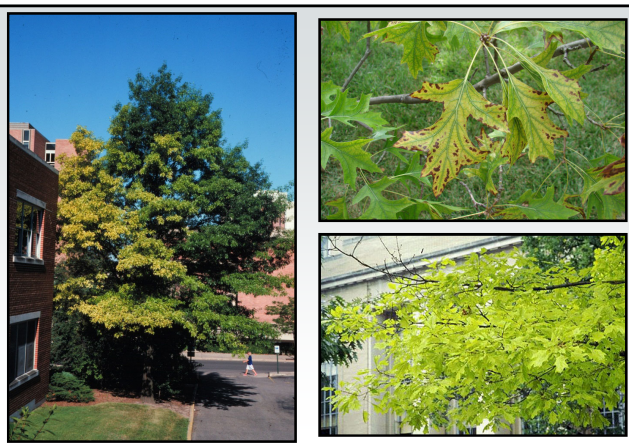
- Control
  - Use immune/resistant plants
    - CONIFERS: Pines, spruces, firs, junipers
    - DECIDUOUS TREES/SHRUBS: Beech, birch, ginkgo, hackberry, hawthorn, hickory, honey locust, mountain ash, white oak, bur oak, poplar, serviceberry, sycamore, willow
  - Prevent stress
  - Prune diseased (wilted) areas

Deciduous Tree and Shrub Diseases
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

Dr. Death's Plant Disease Predictions
Chlorosis

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



Dr. Death's Plant Disease Predictions
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

Dr. Death's Plant Disease Predictions
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

Dr. Death's Plant Disease Predictions
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

Dr. Death's Plant Disease Predictions
Powdery Mildews

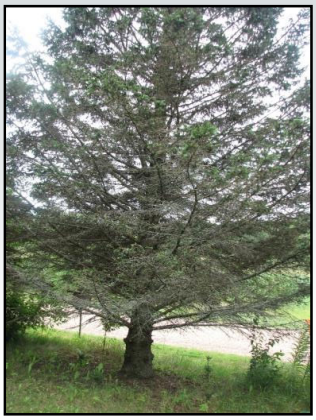
- Control
  - Use fungicides to prevent infections
    - Dithiocarbamates, myclobutanil, propiconazole, tebuconazole, thiophanate-methyl
    - Sulfur, neem oil, other plant-based oils
    - Baking soda (1.5 Tbsp/gal) and light weight horticultural oil (3 Tbsp/gal)
    - Alternate active ingredients (FRAC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

Dr. Death's Plant Disease Predictions
Rhizosphaera Needle Cast

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

Dr. Death's Plant Disease Predictions
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



Dr. Death's Plant Disease Predictions
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

Dr. Death's Plant Disease Predictions
Rhizosphaera Needle Cast

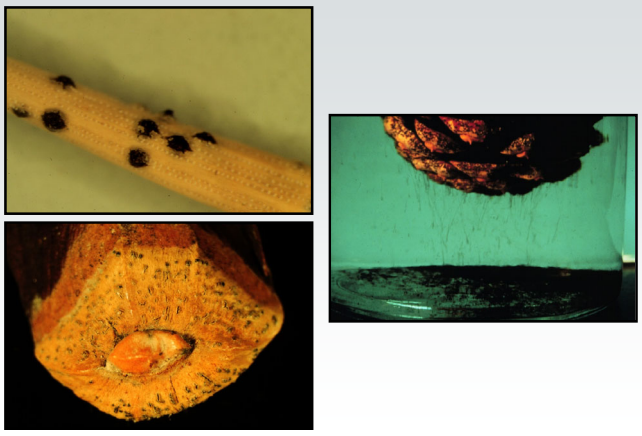
- Control
  - Decontaminate pruning tools (70% alcohol, disinfectants, bleach)
  - Use fungicides to prevent infections
    - Copper, chlorothalonil
    - Alternate active ingredients (FRAC Codes)
    - Start applications at bud break
    - Apply at 3-4 week intervals under favorable conditions

Dr. Death's Plant Disease Predictions
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

Dr. Death's Plant Disease Predictions
Diplodia (Sphaeropsis) Tip Blight

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



Dr. Death's Plant Disease Predictions
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 (?)

Dr. Death's Plant Disease Predictions
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**

Dr. Death's Plant Disease Predictions
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, Twitter, YouTube: @UWPDDC
Subscribe to the PDDC Listserv: UWPDDCLearn