

Advanced Master Gardener Training

Diseases of Bonsai Plants

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



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Diseases of Bonsai Plants Drought Stress

- Cause: Insufficient water
- Hosts: Any bonsai plant

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Diseases of Bonsai Plants Drought Stress

- Management
 - Use an appropriate growth medium
 - Water adequately

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Diseases of Bonsai Plants Root/Crown Rots

- Pathogens
 - *Rhizoctonia solani*
 - *Fusarium* spp.
 - *Cylindrocarpon* spp.
 - *Pythium* spp.
 - *Phytophthora* spp.
- Hosts
 - Any bonsai plant
 - Yew, rhododendron/azalea
- Favorable environment: Cool, wet soils

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Diseases of Bonsai Plants Root/Crown Rots

- **Control**
 - Use a proper growth medium
 - Adequately drained
 - Pasteurized
 - DO NOT use garden soils
 - Decontaminate tools, containers, work areas (70% alcohol, disinfectants, 10% bleach)
 - DO NOT overwater

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Diseases of Bonsai Plants Root/Crown Rots

- **Control**
 - Use fungicides to prevent infections
 - Contract with a professional pesticide applicator
 - PCNB, thiophanate-methyl, fludioxonil, etridiazole, metalaxyl/mefenoxam, fosetyl-Al
 - Alternate active ingredients (FRAC codes)
 - Apply as needed

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Diseases of Bonsai Plants Powdery Mildews

- **Causes**
 - *Erysiphe* spp.
 - *Uncinula* spp.
 - *Phyllactinia* spp.
 - *Blumeria* spp.
 - *Oidium* spp.
 - *Microsphaera* spp.
 - *Sphaerotheca* spp.
 - *Podosphaera* spp.
 - *Brasiliomyces* spp.
 - *Ovulariopsis* spp.

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Diseases of Bonsai Plants Powdery Mildews

- **Hosts**
 - Virtually any broad-leaved bonsai plant
 - Jade plant, maple
 - Not conifers
- **Favorable environment: High humidity**

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Diseases of Bonsai Plants Powdery Mildews

- **Control**
 - Remove/destroy diseased leaves
 - Burn (where allowed)
 - Deep bury
 - Hot compost
 - Reduce humidity
 - Thin canopies
 - Increase air flow
 - Use resistant cultivars/varieties

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Diseases of Bonsai Plants Powdery Mildews

- **Control**
 - Use fungicides to prevent infections
 - Dinocap, dithiocarbamates, myclobutanil, triadimefon, triforine, sulfur or thiophanate-methyl
 - 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

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Diseases of Bonsai Plants Leaf Spots and Blights

- **Diseases (Causes)**
 - Anthracnose (*Discula* spp., *Colletotrichum* spp., et al.)
 - Tar spot (*Rhytisma* spp.)
 - Black spot (*Gnomonia ulmea*)
 - Apple scab (*Venturia inaequalis*)
 - Boxwood blight (*Cylindrocladium pseudonaviculatum*)

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Diseases of Bonsai Plants Leaf Spots and Blights

- **Hosts**
 - Any bonsai plant
 - Maple, oak (anthracnose)
 - Maple (tar spot)
 - Elm (black spot)
 - Crabapple (apple scab)
- **Favorable environment: Wet, cool weather**

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Diseases of Bonsai Plants Leaf Spots and Blights

- Control (except boxwood blight)
 - DO NOT panic
 - Remove/destroy diseased leaves
 - Burn (where allowed)
 - Deep bury
 - Hot compost

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Diseases of Bonsai Plants Leaf Spots and Blights

- Control (except boxwood blight)
 - Limit leaf wetness
 - Thin canopies
 - Increase air flow
 - DO NOT overhead water
 - Use resistant varieties where available

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Diseases of Bonsai Plants Leaf Spots and Blights

- **Control (except boxwood blight)**
 - Use fungicides to prevent infections
 - Exact product depends on the disease
 - Chlorothalonil, copper, mancozeb, myclobutanil, propiconazole, sulfur, thiophanate-methyl
 - Alternate active ingredients (FRAC codes)
 - Apply starting at bud break
 - Number and frequency of applications depends on the disease

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Diseases of Bonsai Plants Leaf Spots and Blights

- **Control (boxwood blight)**
 - Contact the PDDC for a free diagnosis!
 - **Most likely outcome**
 - Remove/destroy entire plant
 - Bag and landfill
 - Burn (where allowed)
 - Consult with WI DATCP regarding trace back

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Diseases of Bonsai Plants Leaf Spots and Blights

- **Control (boxwood blight)**
 - **Less likely outcome**
 - Remove/destroy affected plant parts
 - Burn (where allowed)
 - Bury (two feet)
 - DO NOT compost
 - Limit leaf wetness
 - Thin canopies
 - Increase air flow
 - DO NOT overhead water

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Diseases of Bonsai Plants Leaf Spots and Blights

- **Control (boxwood blight)**
 - **Less likely outcome**
 - Use fungicides treatments
 - Chlorothalonil, mancozeb, thiophanate-methyl
 - Alternate active ingredients (FRAC codes)
 - Apply every 7 days
 - **Decontaminate, decontaminate, decontaminate (70% alcohol, commercial disinfectants)**

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Diseases of Bonsai Plants Leaf Spots and Blights

- **Control (boxwood blight)**
 - Be cautious about holiday wreaths
 - Use shrubs other than boxwood
 - Buy locally produced boxwood
 - Buy from a reputable supplier

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Diseases of Bonsai Plants Leaf Spots and Blights

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

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Diseases of Bonsai Plants Leaf Spots and Blights

- Control (boxwood blight)
 - Avoid symptomatic plants
 - Keep new plants isolated
 - Limit leaf wetness
 - Thin canopies
 - Increase air flow
 - DO NOT overhead water

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Diseases of Bonsai Plants Canker Diseases

- Diseases (Causes)
 - Phomopsis canker (*Phomopsis* spp.)
 - Diplodia canker (*Diplodia* spp.)
 - Nectria canker (*Nectria* spp.)
 - Fire blight (*Erwinia amylovora*)
 - Bacterial canker
(*Pseudomonas syringae* pv. *syringae*)
(*Pseudomonas syringae* pv. *mors-prunorum*)

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Diseases of Bonsai Plants Canker Diseases

- Hosts
 - Juniper (*Phomopsis* canker)
 - Pine (*Diplodia* canker)
 - Maple (*Nectria* canker, *Phomopsis* canker)
 - Crabapple, cotoneaster (fire blight)
 - Cherry (bacterial canker)

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Diseases of Bonsai Plants Canker Diseases

- Favorable environment
 - Wet weather
 - Stress
 - Physical injuries

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Diseases of Bonsai Plants Canker Diseases

- **Control**
 - Reduce environmental stresses/injuries
 - Water and fertilize properly
 - Prune properly
 - Prune/destroy diseased branches
 - Burn (where allowed)
 - Deep bury

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Diseases of Bonsai Plants Canker Diseases

- **Control**
 - Decontaminate pruning tools
(70% alcohol, disinfectants, 10% bleach)
 - Fungicides may or may not be available
 - Yes: Phomopsis canker, Diplodia canker, fire blight
 - No: Nectria canker, bacterial canker

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Diseases of Bonsai Plants Virus Diseases

- **Diseases (Causes)**
 - Impatiens necrotic spot
(*Impatiens necrotic spot virus* = INSV)
 - Tomato spotted wilt
(*Tomato spotted wilt virus* = TSWV)
- **Host: Fuchsia**
- **Favorable environment: Numerous thrips**

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Diseases of Bonsai Plants

Virus Diseases

- **Control**
 - Keep thrips populations under control
 - “Managing Thrips in Greenhouses” (<https://pddc.wisc.edu/fact-sheet-listing-all/>)
 - Contract with a professional pesticide applicator
 - Live with or discard infected plants

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Diseases of Bonsai Plants

Virus Diseases

- **Control**
 - Decontaminate tools, containers, work areas
 - 1% Sodium dodecyl sulfate (sodium lauryl sulfate) + 1% Alconox® (2½ Tbsp + 2¼ Tbsp/gal)
 - Trisodium phosphate (14 dry oz/gal)
 - 20% low fat dry milk (Carnation®) + 0.1% polysorbate 20 (9½ cups + ¼ tsp/gal)
 - Alcohol dip followed by flaming

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Diseases of Bonsai Plants

Chlorosis

- **Cause:** Micronutrient (Fe or Mn) deficiency
- **Affected plants**
 - Oak
 - Birch
 - Rhododendron/azalea
 - Evergreens

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Diseases of Bonsai Plants Chlorosis

- **Management**
 - Monitor soil/water pH and soil nutrients
 - UW Soil and Forage Lab
(<https://uwlabs.soils.wisc.edu/>)
 - Decrease pH
 - Apply sulfur or aluminum sulfate
 - Use acidified water
 - Add chelated Fe and/or Mn as needed
 - Make sure trees are adequately watered

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Diseases of Bonsai Plants 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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