

Greenhouse Growers Seminar

Common Diseases in the Greenhouse and their Management

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Common Diseases in the Greenhouse Damping-Off/Seedling Blights

- **Causes**
 - Pythium spp.
 - Rhizoctonia solani
 - Fusarium spp.
- **Hosts:** Any plant grown from seed
- **Favorable environment:** Cool, wet soils



Common Diseases in the Greenhouse Damping-Off/Seedling Blights

- **Control**
 - Use pathogen-free containers
 - New
 - Decontaminated (10% bleach, 20 minute soak)
 - Decontaminate working surfaces/tools
 - 10% bleach
 - 70% alcohol
 - Commercial disinfectants

Common Diseases in the Greenhouse Damping-Off/Seedling Blights

- **Control**
 - Use an appropriate growing medium
 - DO NOT use field soils
 - Use soilless potting mixes
 - Use pasteurized potting mixes
 - Moderate soil moisture
 - Use well-drained potting mixes
 - Improve drainage in poorly drained potting mixes
 - Avoid overwatering

Common Diseases in the Greenhouse Damping-Off/Seedling Blights

- **Control**
 - Germinate seeds at higher temperatures
 - Use fungicides to protect seedlings
 - captan, etridiazole, mefenoxam, metalaxyl
 - Streptomyces lydicus
 - Trichoderma spp., Gliocladium spp., Pseudomonas spp., Bacillus spp.
 - Apply as a seed treatment or drench

Common Diseases in the Greenhouse Root/Crown Rots

- **Pathogens**
 - Pythium spp.
 - Rhizoctonia solani
 - Cylindrocarpon spp.
 - Phytophthora spp.
 - Fusarium spp.
 - Thielaviopsis spp.
- **Hosts:** Any plant with roots
- **Favorable environment:** Cool, wet soils



Common Diseases in the Greenhouse Root/Crown Rots

- **Control**
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 - Decontaminate working surfaces/tools
 - 10% bleach
 - 70% alcohol
 - Commercial disinfectants

Common Diseases in the Greenhouse Root/Crown Rots

- **Control**
 - Use an appropriate growing medium
 - DO NOT use field soils
 - Use soilless potting mixes
 - Use pasteurized potting mixes
 - Moderate soil moisture
 - Use well-drained potting mixes
 - Improve drainage in poorly drained potting mixes
 - Avoid overwatering

Common Diseases in the Greenhouse Root/Crown Rots

- **Control**
 - Use fungicides to prevent infections
 - etridiazole, metalaxyl, mefenoxam, fosetyl-Al, PCNB, thiophanate-methyl, fludioxonil
 - Alternate active ingredients (FRAC codes)
 - Apply according to label recommendations
 - Use biopesticides to prevent infections
 - Trichoderma, Gliocladium
 - Exercise caution when combining with chemical fungicides

Common Diseases in the Greenhouse Powdery Mildews

- **Cause**
 - Erysiphe spp.
 - Uncinula spp.
 - Phyllactinia spp.
 - Blumeria spp.
 - Oidium spp.
 - Microsphaera spp.
 - Sphaerotheca spp.
 - Podosphaera spp.
 - Brasiliomyces spp.
 - Ovulariopsis spp.
- **Hosts:** Virtually anything (but conifers)
- **Favorable environment:** High humidity



Common Diseases in the Greenhouse Powdery Mildews

- **Control**
 - Remove infected plant parts/infested debris
 - Burn (where allowed)
 - Deep bury
 - Hot compost
 - Reduce humidity
 - Increase plant spacing
 - Increase air flow
 - Use resistant cultivars/varieties

Common Diseases in the Greenhouse 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

Common Diseases in the Greenhouse Impatiens Downy Mildew

- **Cause:** *Plasmopara obducens*
- **Hosts**
 - Standard garden impatiens (*I. walleriana*)
 - Balsam impatiens (*I. balsamina*)
 - Jewelweed (*I. pallida*, *I. capensis*)
 - New Guinea impatiens (*I. hawkeri*) (resistant/tolerant)

Common Diseases in the Greenhouse Impatiens Downy Mildew

- **Favorable environment**
 - Cool conditions (59 - 73°F)
 - Long leaf wetness periods (> 6 hrs)
 - High humidity



Common Diseases in the Greenhouse *Impatiens Downy Mildew*

- **Control**
 - Grow immune/resistant/tolerant species
 - Start with clean seed and transplants
 - Move (i.e., rotate) *impatiens* production
 - Separate different source materials
 - Promote rapid plant drying
 - Increase plant spacing
 - Increase air flow
 - Avoid overhead watering

Common Diseases in the Greenhouse *Impatiens Downy Mildew*

- **Control**
 - Scout frequently
 - Bag and discard affected plants
 - Symptomatic plants
 - Asymptomatic surrounding plants
 - Decontaminate pots/working surfaces/tools
 - Commercial disinfectants
 - 10% bleach
 - 70% alcohol

Common Diseases in the Greenhouse *Impatiens Downy Mildew*

- **Control**
 - Use fungicides to prevent infections
 - mefenoxam, fluopicolide, potassium phosphite, mancozeb, pyraclostrobin + boscalid, fluoxastobin, cyazofamid, dimethomorph, fenamidone, azoxystrobin
 - Alternate active ingredients (FRAC Codes)
 - Apply at 7 day application intervals

Common Diseases in the Greenhouse *Viral Diseases*

- **Pathogens**
 - Many, with more discovered all the time
 - Wide-range viruses
 - *Impatiens necrotic spot virus* (INSV)
 - *Tomato spotted wilt virus* (TSWV)
 - *Tobacco mosaic virus* (TMV)
 - *Cucumber mosaic virus* (CMV)
 - *Tobacco rattle virus* (TRV)

Common Diseases in the Greenhouse *Viral Diseases*

- **Pathogens**
 - Narrow-range viruses
 - *Cymbidium mosaic virus* (CyMV)
 - *Odontoglossum ringspot virus* (ORSV)
 - *Hosta virus X* (HVX)
- **Favorable environment: None**
- **Transmission: Insect, mechanical, seed**





Common Diseases in the Greenhouse Viral Diseases

- **Control**
 - Inspect/test plants prior to purchase (Agdia, Inc. – www.agdia.com)
 - DO NOT smoke around plants
 - Control insects
 - Control weeds
 - Remove infected plant parts/infested debris
 - Burn (where allowed)/incinerate
 - Deep bury

Common Diseases in the Greenhouse Viral Diseases

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

Common Diseases in the Greenhouse Viral Diseases

- **Control**
 - Wash hands, particularly if you smoke
 - Decontaminate recycled water
 - DO NOT use chemical control

Common Diseases in the Greenhouse Xanthomonas Diseases

- **Causes:** Xanthomonas spp.
- **Hosts**
 - Geranium
 - Poinsettia
 - Anthurium
 - Begonia
 - Ivy
 - Others
- **Favorable environment:** High moisture



Common Diseases in the Greenhouse *Xanthomonas* Diseases

- **Control**
 - Inspect/test plants before purchase
 - Promote rapid plant drying
 - Increase plant spacing
 - Increase air flow
 - Avoid overhead watering
 - Avoid handling plants when wet
 - Avoid carrying over plants from year to year

Common Diseases in the Greenhouse *Xanthomonas* Diseases

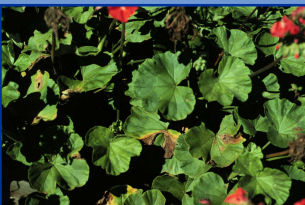
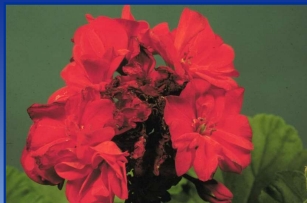
- **Control**
 - Remove infected plant parts/plant debris
 - Burn (where allowed)
 - Deep bury
 - Hot compost
 - Decontaminate pots/working surfaces/tools
 - 70% alcohol
 - Commercial disinfectants
 - 10% bleach

Common Diseases in the Greenhouse *Xanthomonas* Diseases

- **Control**
 - DO NOT use bactericides

Common Diseases in the Greenhouse *Botrytis* Blight/Gray Mold

- **Pathogen:** *Botrytis cinerea*
- **Hosts**
 - Virtually any herbaceous plant
 - Seedlings
 - Cuttings
 - Flowers
- **Favorable environment:** High moisture



Common Diseases in the Greenhouse *Botrytis* Blight/Gray Mold

- **Control**
 - Remove infected plant parts/infested debris
 - Burn (where allowed)
 - Deep bury
 - Hot compost
 - Promote rapid plant drying
 - Increase plant spacing
 - Increase air flow
 - Avoid overhead watering

Common Diseases in the Greenhouse **Botrytis Blight/Gray Mold**

- **Control**
 - Use fungicides to prevent infections
 - chlorothalonil, copper-containing fungicides, fludioxonil, mancozeb, thiophanate-methyl
 - Alternate active ingredients (FRAC Codes)
 - Apply during periods of high moisture
 - Apply at 7-14 day intervals

Common Diseases in the Greenhouse **Foliar Nematode**

- **Cause:** Aphelenchoides spp.
- **Hosts**
 - Many types of herbaceous plants
 - Landscape plants
 - Hosta, begonia, coral bells, miterwort
 - Houseplants
 - African violets, ferns, chrysanthemum
- **Favorable environment:** High moisture



Common Diseases in the Greenhouse **Foliar Nematode**

- **Control**
 - Inspect plants prior to purchase
 - Avoid overhead watering
 - Remove infected plants/infested plant debris
 - Burn (where allowed)
 - Deep bury (landfill)
 - Hot compost

Common Diseases in the Greenhouse **Foliar Nematode**

- **Control**
 - Decontaminate pots/working surfaces/tools
 - 70% alcohol
 - Commercial disinfectants
 - 10% bleach
 - Use hot water treatments (10 minutes at 125°F for hostas)
 - DO NOT use nematicides

Common Diseases in the Greenhouse **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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