

Jackson County Seminar

Dr. Death's Top Ten Plant Diseases

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Dr. Death's Top Ten Plant Diseases Powdery Mildews

• Causes

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

Dr. Death's Top Ten Plant Diseases Powdery Mildews

• Hosts

- Virtually everything
- Not conifers

- Favorable environment: High humidity





Dr. Death's Top Ten Plant Diseases Powdery Mildews

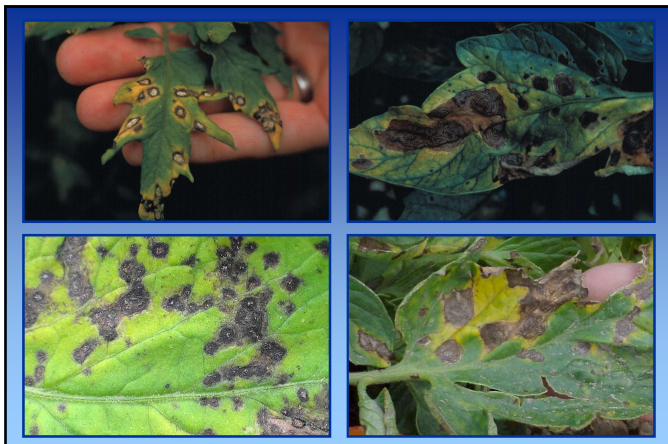
- **Control**
 - Remove/destroy diseased leaves
 - Burn (where allowed)
 - Deep bury
 - Hot compost
 - Reduce humidity
 - Plant less densely
 - Thin canopies
 - Use resistant cultivars/varieties

Dr. Death's Top Ten Plant Diseases 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

Dr. Death's Top Ten Plant Diseases Tomato Fungal Leaf Blights

- **Causes**
 - 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 Top Ten Plant Diseases Tomato Fungal Leaf Blights

- **Control (early blight, Septoria leaf spot)**
 - Remove and destroy infested debris (burn, bury, hot compost)
 - Move tomatoes to new location (?)
 - Plant resistant varieties (?)
 - Space plants far apart
 - Mulch around the base of plants
 - DO NOT over-mulch

Dr. Death's Top Ten Plant Diseases Tomato Fungal Leaf Blights

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

Dr. Death's Top Ten Plant Diseases Tomato Fungal Leaf Blights

- **Control (late blight)**
 - Remove and destroy
 - Infected plants, fruits, tubers
 - Volunteer tomato and potato plants
 - Weed hosts
 - DO NOT use last year's potatoes as seed
 - DO use certified seed potatoes

Dr. Death's Top Ten Plant Diseases Tomato Fungal Leaf Blights

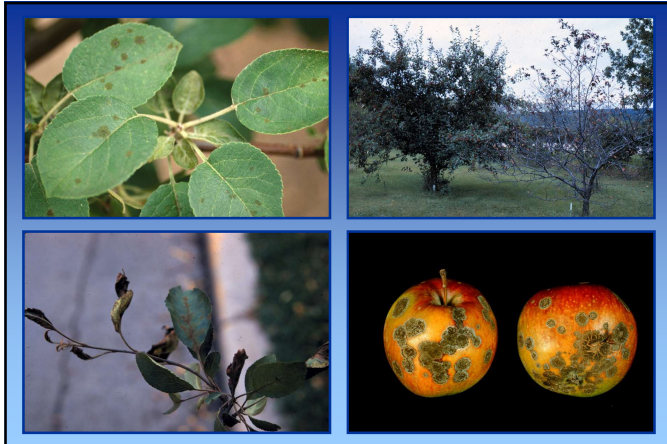
- **Control (late blight)**
 - Grow resistant tomato varieties
 - "Late Blight Management in Tomato with Resistant Varieties"
 - <http://www.extension.org/pages/72678/late-blight-management-in-tomato-with-resistant-varieties#.VVNSsPIVhBd>

Dr. Death's Top Ten Plant Diseases Tomato Fungal Leaf Blights

- **Control (late blight)**
 - Use fungicides to prevent infections
 - Chlorothalonil, mancozeb
 - Copper
 - Alternate active ingredients (FRAC codes)
 - Start applications based on Blitecast (<http://www.plantpath.wisc.edu/wivegdis/>)
 - Apply at 7-14 day intervals

Dr. Death's Top Ten Plant Diseases Scab (Apple and Pear)

- **Causes**
 - Venturia inaequalis
 - Venturia pirina
- **Hosts**
 - Apple/crabapple
 - Pear
 - Mountain ash
- **Favorable environment:** Cool, wet weather



Dr. Death's Top Ten Plant Diseases Scab (Apple and Pear)

- **Control**
 - Plant resistant varieties
 - “Growing Apples (Pears) in Wisconsin” (<https://learningstore.uwex.edu/>)
 - Remove/destroy diseased leaves
 - Burn (where allowed)
 - Deep bury
 - Hot compost
 - Thin trees to promote air flow

Dr. Death's Top Ten Plant Diseases Scab (Apple and Pear)

- **Control**
 - Use fungicides to prevent infections
 - Chlorothalonil, copper, mancozeb, myclobutanil, propiconazole, thiophanate-methyl, sulfur
 - Alternate active ingredients (FRAC codes)
 - Apply from bud break through the end of favorable weather
 - Apply at 7-14 day intervals

Dr. Death's Top Ten Plant Diseases Rhizosphaera Needle Cast

- **Pathogen:** *Rhizosphaera kalkhoffii*
Rhizosphaera spp.
- **Hosts (major)**
 - Colorado blue spruce
 - Other spruces: Engelmann, black, Serbian, Sitka, white (Black Hills)

Dr. Death's Top Ten Plant Diseases 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 Top Ten Plant Diseases *Rhizosphaera Needle Cast*

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

Dr. Death's Top Ten Plant Diseases *Rhizosphaera Needle Cast*

- **Control**
 - Decontaminate pruning tools
 - 70% alcohol (spray disinfectants)
 - Commercial disinfectants
 - 10% bleach
 - Destroy infected materials
 - Burn (where allowed)
 - Deep bury
 - Hot compost (needles)

Dr. Death's Top Ten Plant Diseases *Rhizosphaera Needle Cast*

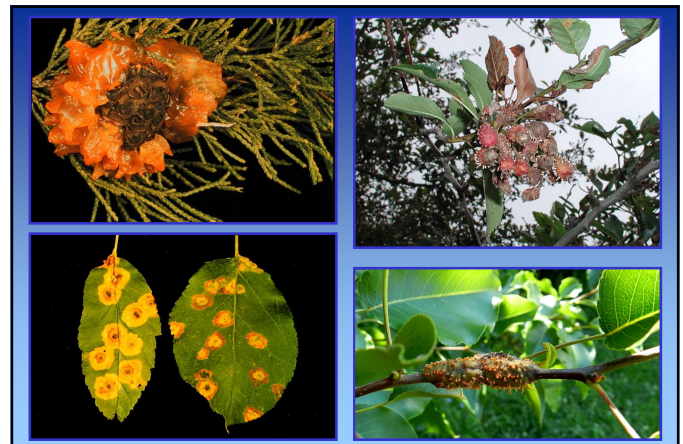
- **Control**
 - Use fungicides to prevent infections
 - Copper-containing fungicides, chlorothalonil
 - Alternate active ingredients (FRAC codes)
 - Apply starting at bud break and at 3-4 week intervals thereafter under favorable conditions

Dr. Death's Top Ten Plant Diseases *Gymnosporangium Rusts*

- **Causes**
 - *Gymnosporangium juniperi-virginianae*
(Cedar-apple rust)
 - *Gymnosporangium globosum*
(Cedar-hawthorn rust)
 - *Gymnosporangium clavipes*
(Cedar-quince rust)

Dr. Death's Top Ten Plant Diseases *Gymnosporangium Rusts*

- **Hosts**
 - Junipers
 - Woody rosaceous plants
(apple, crabapple, hawthorn, quince, pear, serviceberry)
- **Favorable environment**
 - Cool to moderate temperatures
 - Wet weather



Dr. Death's Top Ten Plant Diseases Gymnosporangium Rusts

- **Control**
 - Grow only the juniper or rosaceous host
 - Use resistant cultivars/varieties
 - “Juniper Diseases”
(<https://store.extension.iastate.edu/Product/5247>)
 - Remove galls

Dr. Death's Top Ten Plant Diseases Gymnosporangium Rusts

- **Control**
 - Decontaminate pruning tools
 - 70% alcohol (spray disinfectants)
 - Commercial disinfectants
 - 10% bleach
 - Destroy infected materials
 - Burn (where allowed)
 - Deep bury

Dr. Death's Top Ten Plant Diseases Gymnosporangium Rusts

- **Control**
 - Use fungicides to prevent infections
 - Ferbam, triadimefon
 - Alternate active ingredients (FRAC codes)
 - Apply at 7-21 day intervals [mid-May through mid-June (rosaceous hosts), early July through August (juniper hosts)]

Dr. Death's Top Ten Plant Diseases Black Knot

- **Cause:** Apiosporina morbosa
- **Hosts**
 - Prunus species
 - Plums
 - Cherries
- **Favorable environment:** Wet weather



Dr. Death's Top Ten Plant Diseases Black Knot

- **Control**
 - DO NOT plant infected Prunus stock
 - Buy black knot-resistant varieties if available
 - Accolade flowering cherry (Prunus 'Accolade')
 - Sargent's cherry (Prunus sargentii)
 - Amur chokecherry (Prunus maackii)
 - Remove volunteer plums/cherries
 - Prune diseased branches

Dr. Death's Top Ten Plant Diseases **Black Knot**

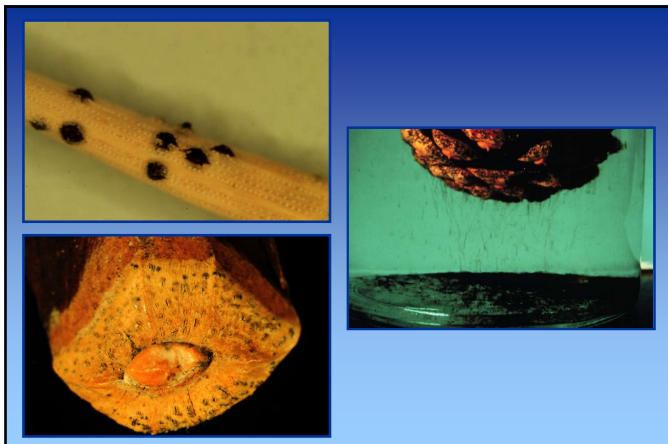
- **Control**
 - Decontaminate pruning tools
 - 70% alcohol (spray disinfectants)
 - Commercial disinfectants
 - 10% bleach
 - Destroy infected materials
 - Burn (where allowed)
 - Deep bury
 - **DO NOT** use fungicides

Dr. Death's Top Ten Plant Diseases **Diplodia (Sphaeropsis) Shoot Blight**

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

Dr. Death's Top Ten Plant Diseases **Diplodia (Sphaeropsis) Shoot Blight**

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



Dr. Death's Top Ten Plant Diseases **Diplodia (Sphaeropsis) Shoot Blight**

- **Control**
 - **DO NOT** plant Austrian pines
 - Prevent tree stress, particularly water stress
 - Thin branches to increase airflow
 - Prune diseased branches

Dr. Death's Top Ten Plant Diseases *Diplodia (Sphaeropsis) Shoot Blight*

- **Control**
 - Decontaminate pruning tools
 - 70% alcohol (spray disinfectants)
 - Commercial disinfectants
 - 10% bleach
 - Remove infected cones (?)
 - Destroy infected materials
 - Burn (where allowed)
 - Deep bury

Dr. Death's Top Ten Plant Diseases *Diplodia (Sphaeropsis) Shoot Blight*

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

Dr. Death's Top Ten Plant Diseases *Aster Yellows*

- **Pathogen:** *Aster yellows phytoplasma*
- **Hosts**
 - Many plants in the *Asteraceae* (aster family)
 - Many other plants in many other plant families
- **Favorable environment:** None
- **Vector:** *Aster leafhopper*



Dr. Death's Top Ten Plant Diseases *Aster Yellows*

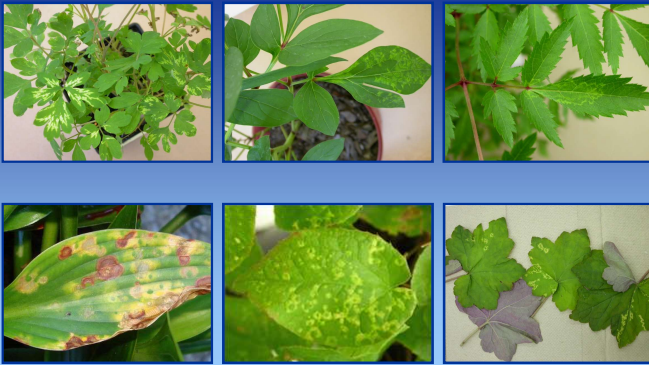
- **Control**
 - Remove diseased plant material and debris
 - Hot compost
 - Bury
 - Burn (where allowed)
 - Control leafhopper vector (?)

Dr. Death's Top Ten Plant Diseases Tobacco Rattle

- **Cause:** Tobacco Rattle Virus
- **Hosts**
 - **Ornamentals**
 - Astilbe, bleeding heart, columbine, coral bells, daffodils, epimedium, gladiolus, hyacinth, marigold, peony, tulip, vinca
 - **Vegetables**
 - Beans, beet, pepper, potato, spinach
- **Favorable environment:** None

Dr. Death's Top Ten Plant Diseases Tobacco Rattle

- **Transmission**
 - Stubby-root nematodes
 - Trichodorus spp.
 - Paratrichodorus spp.
 - Mechanical
 - Grafting
 - Seed



Dr. Death's Top Ten Plant Diseases Tobacco Rattle

- **Control**
 - DO NOT buy symptomatic plants
 - Grow non-susceptible plants
 - Annual phlox, carnation, devil's trumpet (downy thorn-apple), sweet William, zinnia, zombie cucumber
 - Remove and destroy infected plants
 - Burn (where allowed)
 - Deep bury
 - Hot compost

Dr. Death's Top Ten Plant Diseases Tobacco Rattle

- **Control**
 - Disinfest contaminated materials
 - 1% Sodium dodecyl sulfate (sodium lauryl sulfate) + 1% Alconox® (2½ Tbsp + 2¾ Tbsp/gal)
 - 20% low fat dry milk (Carnation®) + 0.1% polysorbate 20 (9½ cups + ¾ tsp/gal)
 - Trisodium phosphate (14 dry oz/gal)
 - Alcohol dip followed by flaming
 - DO NOT attempt to control stubby-root nematodes

Dr. Death's Top Ten Plant Diseases Tobacco Rattle

- **Control**
 - DO NOT use chemical controls on plants
 - DO NOT attempt to control stubby-root nematodes

Dr. Death's Top Ten Plant Diseases *Verticillium Wilt*

• Causes

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

Dr. Death's Top Ten Plant Diseases *Verticillium Wilt*

• Hosts

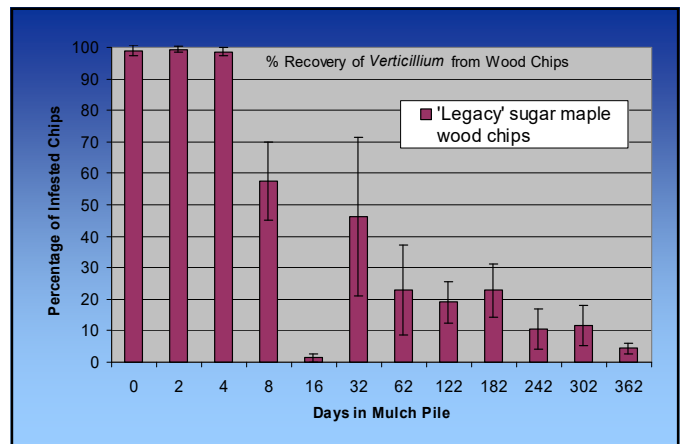
- Many woody ornamentals
 - Common: Maple, ash, redbud, smokebush
 - "New": Seven son flower, wafer-ash, buttonbush
 - Many herbaceous plants
 - Many vegetables (tomato, potato, EGGPLANT)
- ### • Favorable environment
- Cool, wet weather (for infection)
 - Hot, dry weather (for symptom development)



Dr. Death's Top Ten Plant 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
- Avoid municipal mulches





- **Wood Chips as an Inoculum Source**

- **Amur maple**
 - 30.0%/25.0% (Trted)
 - 0.0%/0.0% (Non-Trted)
- **Green Ash**
 - 23.7%/10.5% (Trted)
 - 0.0%/0.0% (Non-Trted)
- **Redbud**
 - 10.7%/13.3% (Trted)
 - 0.0%/0.0% (Non-Trted)

Dr. Death's Top Ten Plant 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**

Dr. Death's Top Ten Plant Diseases Verticillium Wilt

- **Control**

- **Decontaminate pruning tools**
 - 70% alcohol (spray disinfectants)
 - Commercial disinfectants
 - 10% bleach
- **Make plants comfortable until they die**
- **Remove and destroy diseased plants**
 - Burn (where allowed)
- **DO NOT use fungicides**

Dr. Death's Top Ten Plant Diseases 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
<http://pddc.wisc.edu>
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