

Advanced Master Gardener Training

Deciduous Tree and Shrub Diseases

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Deciduous Tree and Shrub Diseases 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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Deciduous Tree and Shrub Diseases Powdery Mildews

• Hosts

- Virtually everything
- Not conifers

• Favorable environment: High humidity

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Deciduous Tree and Shrub 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

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Deciduous Tree and Shrub Diseases Powdery Mildews

• Control

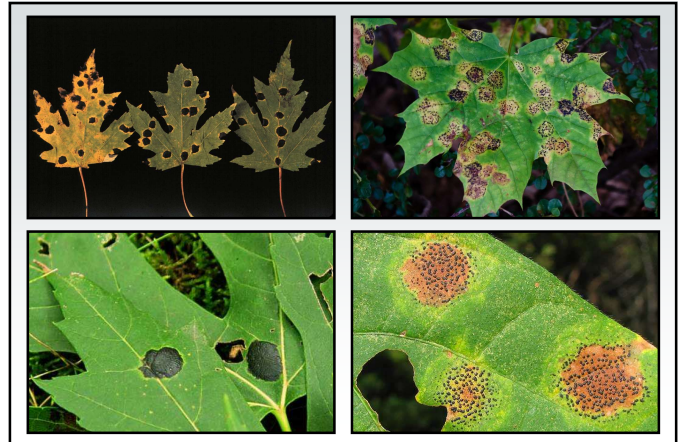
- Use fungicides to prevent infections
 - Dinocap, dithiocarbamates, myclobutanil, triadimefon, triforine, sulfur or thiophanate-methyl
 - Baking soda (1.5 Tbsp/gal) and light weight horticultural oil (3 Tbsp/gal)
 - Alternate active ingredients (FRAC codes)
 - Apply when humidity >60-70%
 - Apply at 7 to 14-day intervals

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Deciduous Tree and Shrub Diseases Tar Spot

- **Causes**
 - *Rhytisma americanum*
 - *Rhytisma acerinum*
- **Hosts: Maples**
- **Favorable environment: Cool, wet weather**

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Deciduous Tree and Shrub Diseases Tar Spot

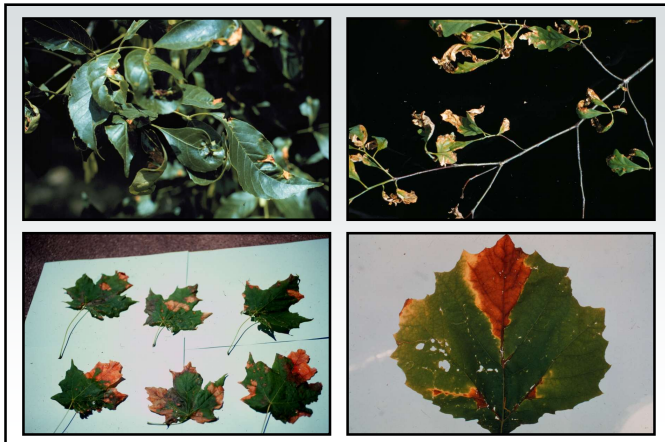
- **Control**
 - DO NOT panic
 - Remove/destroy diseased leaves
 - Burn (where allowed)
 - Deep bury
 - Hot compost
 - Use fungicides to prevent infections
 - Copper
 - Apply at bud break, 1/2 and full leaf expansion

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Deciduous Tree and Shrub Diseases Anthracnose

- **Causes**
 - *Gloeosporium* spp.
 - *Discula* spp.
 - *Colletotrichum* spp.
 - Many other fungi
- **Hosts**
 - Any deciduous tree
 - Ash, maple, oak
 - Sycamore
- **Favorable environment: Cool, wet weather**

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Deciduous Tree and Shrub Diseases Anthracnose

- **Control**
 - DO NOT panic
 - Remove/destroy diseased leaves and branches
 - Burn (where allowed)
 - Deep bury
 - Hot compost

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Deciduous Tree and Shrub Diseases Anthracnose

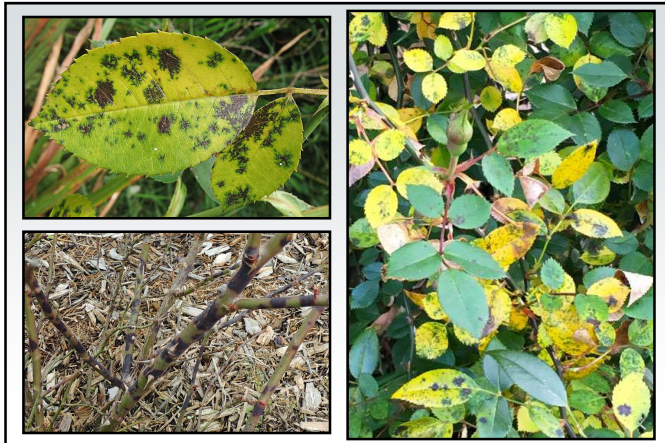
- **Control**
 - Use fungicides to prevent infections
 - Copper, chlorothalonil, mancozeb, thiophanate-methyl
 - Alternate active ingredients (FRAC codes)
 - Apply at bud break, 1/2 and full leaf expansion

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Deciduous Tree and Shrub Diseases Black Spot

- **Cause:** *Marssonina rosae*
- **Host:** Rose
- **Favorable environment:** Cool, wet weather

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Deciduous Tree and Shrub Diseases Black Spot

- **Control**
 - Plant resistant rose varieties
 - Promote rapid drying of leaves and canes
 - DO NOT overcrowd plants
 - Prune to thin established plants
 - DO NOT overhead water
 - DO NOT overwater

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Deciduous Tree and Shrub Diseases Black Spot

- **Control**
 - Remove/destroy diseased leaves and canes
 - Burn (where allowed)
 - Deep bury
 - Hot compost
 - Decontaminate pruning tools
(70% alcohol, disinfectants, 10% bleach)

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Deciduous Tree and Shrub Diseases Black Spot

- **Control**
 - Use fungicides to prevent infections
 - Chlorothalonil, copper, mancozeb, maneb, myclobutanil, propiconazole, thiophanate-methyl
 - Neem oil
 - Baking soda (1.5 Tbsp/gal) and light weight horticultural oil (3 Tbsp/gal)
 - Alternate active ingredients (FRAC Codes)
 - Apply at 7 to 14-day intervals

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Deciduous Tree and Shrub Diseases Scab (Apple and Pear)

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

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Deciduous Tree and Shrub Diseases Scab (Apple and Pear)

- **Control**
 - Plant resistant varieties
 - “Home Fruit Cultivars for Northern Wisconsin” (<https://learningstore.uwex.edu/>)
 - “Home Fruit Cultivars for Southern Wisconsin” (<https://learningstore.uwex.edu/>)
 - “Top Ornamental Crabapples for Wisconsin” (<https://pddc.wisc.edu/fact-sheet-listing-all/>)

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Deciduous Tree and Shrub Diseases Scab (Apple and Pear)

- **Control**
 - Remove/destroy diseased leaves
 - Burn (where allowed)
 - Deep bury
 - Hot compost
 - Thin trees to promote air flow

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Deciduous Tree and Shrub 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 to 14-day intervals

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Deciduous Tree and Shrub Diseases Taphrina Diseases of Stone Fruits

- **Causes**
 - *Taphrina deformans* (Peach leaf curl)
 - *Taphrina cerasi* (Cherry leaf curl)
 - *Taphrina communis* (Plum pockets)

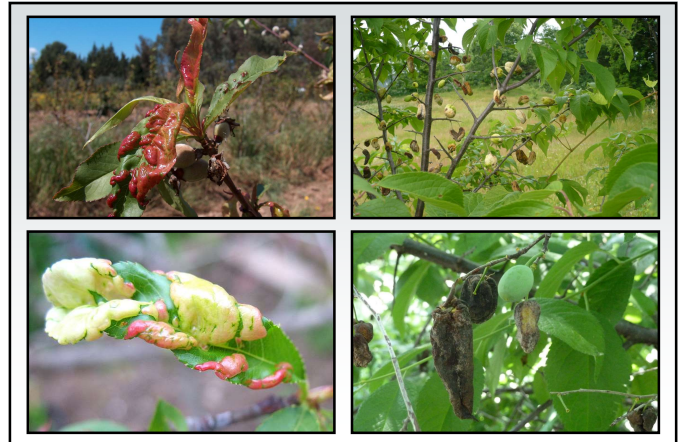
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Deciduous Tree and Shrub Diseases

Taphrina Diseases of Stone Fruits

- **Host**
 - Peach, nectarine (peach leaf curl)
 - Cherry (cherry leaf curl)
 - Plum (plum pockets)
- **Favorable environment: Wet weather**

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Deciduous Tree and Shrub Diseases

Taphrina Diseases of Stone Fruits

- **Control**
 - Remove and destroy symptomatic fruits
 - Burn (where allowed)
 - Bury
 - Hot compost
 - Prune/thin trees to improve air flow
 - Decontaminate pruning tools (70% alcohol, disinfectants, 10% bleach)

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Deciduous Tree and Shrub Diseases

Taphrina Diseases of Stone Fruits

- **Control**
 - Use fungicides to prevent infections
 - Chlorothalonil, copper, ferbam
 - Apply after leaf fall and/or before leaf emergence

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Deciduous Tree and Shrub Diseases

Gymnosporangium Rusts

- **Pathogens: *Gymnosporangium* spp.**
 - *Gymnosporangium juniperi-virginianae* (Cedar-apple rust)
 - *Gymnosporangium globosum* (Cedar-hawthorn rust)
 - *Gymnosporangium clavipes* (Cedar-quince rust)

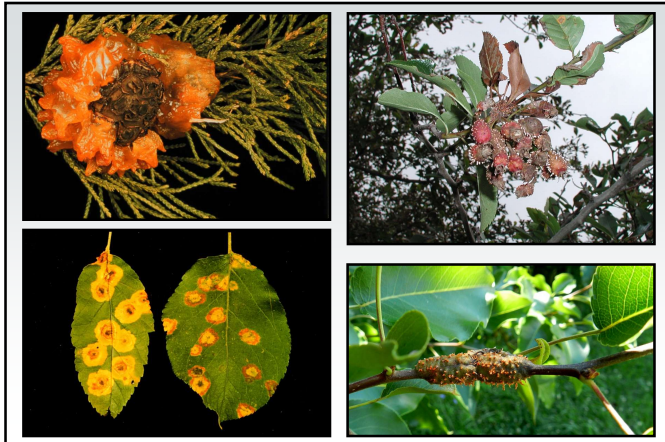
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Deciduous Tree and Shrub Diseases

Gymnosporangium Rusts

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

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Deciduous Tree and Shrub Diseases Gymnosporangium Rusts

- Control
 - Grow only junipers or rosaceous hosts
 - Use resistant cultivars/varieties
 - “Juniper Diseases”
(<https://store.extension.iastate.edu/Product/Juniper-Diseases>)
 - “Home Fruit Cultivars for Northern Wisconsin”
(<https://learningstore.uwex.edu/>)
 - “Home Fruit Cultivars for Southern Wisconsin”
(<https://learningstore.uwex.edu/>)

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Deciduous Tree and Shrub Diseases Gymnosporangium Rusts

- Control
 - Remove galls
 - Decontaminate pruning tools
(70% alcohol, disinfectants, 10% bleach)
 - Destroy infected materials
 - Burn (where allowed)
 - Deep bury

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Deciduous Tree and Shrub Diseases 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

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Deciduous Tree and Shrub Diseases Black Knot

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

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Deciduous Tree and Shrub 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

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Deciduous Tree and Shrub Diseases

Black Knot

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

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Deciduous Tree and Shrub Diseases

Crown Gall

- Causes
 - *Agrobacterium tumefaciens*
 - *Agrobacterium vitis*
- Hosts
 - Plants in 93 plant families
 - Trees and shrubs (deciduous and coniferous)
 - Herbaceous plants
- Favorable environment: None

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Deciduous Tree and Shrub Diseases

Crown Gall

- Control
 - DO NOT buy infected plant
 - Buy well-adapted, winter-hardy plants
 - Avoid wounding plants during transplant
 - Consider root dips of *A. radiobacter*
 - Prune out galls
 - Decontaminate pruning tools
(70% alcohol, disinfectants, 10% bleach)

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Deciduous Tree and Shrub Diseases

Crown Gall

- Control
 - Remove plants (including roots) and soil
 - Destroy infected materials
 - Burn (where allowed)
 - Landfill
 - Plant nonsusceptible plants
 - DO NOT use bactericides

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Deciduous Tree and Shrub Diseases

Dutch Elm Disease

- **Causes**
 - *Ophiostoma ulmi* (*Ceratocystis ulmi*)
 - *Ophiostoma novo-ulmi*
 - *Pesotum ulmi* (*Graphium ulmi*)
- **Hosts: Elms (*Ulmus* spp.)**
 - High susceptibility
 - American, Belgian, English, red, rock, September, European white, winged

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Deciduous Tree and Shrub Diseases

Dutch Elm Disease

- **Hosts**
 - Intermediate susceptibility
 - Cedar, European field (smooth-leaf), wych (Scots)
 - Low susceptibility
 - Siberian, Chinese
- **Favorable environment**
 - Cool, wet conditions (for infection)
 - Hot, dry weather (for symptom development)

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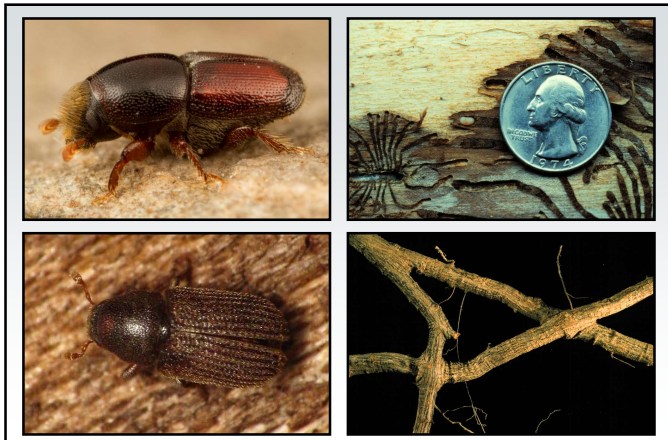
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Deciduous Tree and Shrub Diseases

Dutch Elm Disease

- **Transmission**
 - Elm bark beetles
 - *Scolytus multistriatus* (European)
 - *Hylurgopinus rufipes* (Native)
 - Root grafts
 - Major method of movement in elm groves
 - *Ophiostoma* spp. can reach the roots during the first season of infection

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Deciduous Tree and Shrub Diseases

Dutch Elm Disease

- **Control**
 - Remove diseased elms
 - Disrupt root grafts
 - Mechanically (vibratory plow or trenching machine)
 - Chemically (soil fumigant)
 - Physical barriers
 - Be careful using elm wood
 - Remove bark
 - Cover wood

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Deciduous Tree and Shrub Diseases

Dutch Elm Disease

- **Control**
 - Prune diseased branches
 - Decontaminate pruning tools (70% alcohol, disinfectants, 10% bleach)
 - Use fungicides injections
 - Propiconazole, thiabendazole
 - Prophylactic or therapeutic
 - Inject every 12-24 months

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Deciduous Tree and Shrub Diseases

Dutch Elm Disease

- **Control**
 - Plant resistant elms
 - Crosses between American and other elms
 - True American elms varieties
 - 'American Liberty'
 - 'Independence'
 - 'Princeton'
 - 'New Harmony'
 - 'Valley Forge'
 - Others

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Deciduous Tree and Shrub Diseases

Dutch Elm Disease

- **Control**
 - Treatments of dubious use
 - Tracing
 - *Verticillium dahliae* injections

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Deciduous Tree and Shrub Diseases

Oak Wilt

- **Cause**
 - *Bretziella fagacearum* (*Ceratocystis fagacearum*)
 - *Chalara* sp.
- **Hosts**
 - Red oak group: Red, black, pin
 - White oak group: White, bur, swamp white
 - Chinese chestnut

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Deciduous Tree and Shrub Diseases

Oak Wilt

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

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Deciduous Tree and Shrub Diseases Oak Wilt

- **Transmission**
 - Oak bark beetles
 - *Pseudopityophthorus minutissimus*
 - *Pseudopityophthorus pruinosis*
 - Sap beetles
 - *Carpophilus* spp.
 - *Epuraea* spp.
 - *Colopterus* spp.
 - *Clischrochilus* spp.
 - *Cryptarcha* spp.

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Deciduous Tree and Shrub Diseases 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

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Deciduous Tree and Shrub Diseases 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.uwex.edu/>)
 - Mechanically (vibratory plow or trenching machine)
 - Chemically (soil fumigant)
 - Physical barriers

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Deciduous Tree and Shrub Diseases Oak Wilt

- **Control**
 - Remove diseased (and healthy) trees
 - Decontaminate pruning tools (70% alcohol, disinfectants, 10% bleach)
 - Be careful using oak wood
 - Remove bark
 - Cover wood

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Deciduous Tree and Shrub Diseases Oak Wilt

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

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Deciduous Tree and Shrub Diseases Verticillium Wilt

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

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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
 - New: Vervain ('Quartz White')

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Deciduous Tree and Shrub Diseases Verticillium Wilt

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

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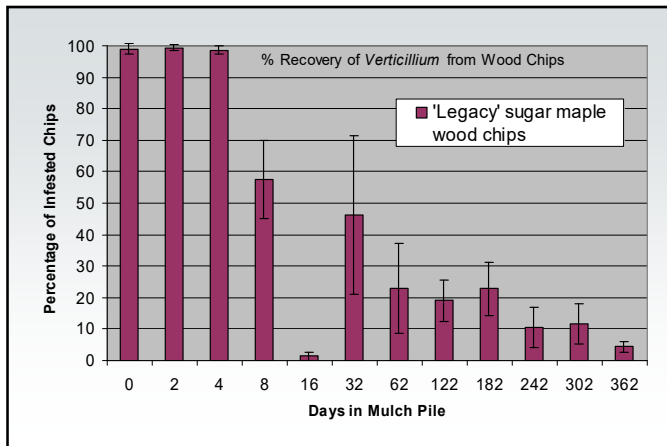


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Deciduous Tree and Shrub Diseases Verticillium Wilt

- **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

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- **Wood Chips as an Inoculum Source**
 - **Amur maple**
 - 30.0%/25.0% (Trtd)
 - 0.0%/0.0% (Non-Trtd)
 - **Green Ash**
 - 23.7%/10.5% (Trtd)
 - 0.0%/0.0% (Non-Trtd)
 - **Redbud**
 - 10.7%/13.3% (Trtd)
 - 0.0%/0.0% (Non-Trtd)

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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

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Deciduous Tree and Shrub Diseases Verticillium Wilt

- **Control**
 - Decontaminate pruning tools (70% alcohol, disinfectants, 10% bleach)
 - Make plants comfortable until they die
 - Remove and destroy diseased plants/leaves
 - Burn (where allowed)
 - Hot compost (?)
 - DO NOT use fungicides

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Deciduous Tree and Shrub Diseases Nectria Canker

- Pathogens: *Nectria* spp.
- Hosts
 - Many woody ornamentals
 - Honey locust
- Favorable environment
 - Injuries/wounds
 - Wet weather

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Deciduous Tree and Shrub Diseases Nectria Canker

- **Control**
 - Choose well-adapted trees and shrubs
 - Reduce environmental stresses/injuries
 - Water and fertilize properly
 - Prune properly when maintenance pruning
 - “How to Properly Prune Deciduous Trees” (<https://pddc.wisc.edu/fact-sheet-listing-all/>)
 - “How to Properly Prune Deciduous Shrubs” (<https://pddc.wisc.edu/fact-sheet-listing-all/>)

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Deciduous Tree and Shrub Diseases Nectria Canker

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

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Deciduous Tree and Shrub Diseases Golden Canker

- **Cause:** *Cryptodiaporthe corni*
- **Host:** Pagoda dogwood
- **Favorable environment**
 - Water stress
 - Heat stress

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Deciduous Tree and Shrub Diseases Golden Canker

- **Control**
 - Prune diseased branches
 - Decontaminate pruning tools (70% alcohol, disinfectants, 10% bleach)
 - Destroy infected materials
 - Burn (where allowed)
 - Deep bury

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Deciduous Tree and Shrub Diseases Golden Canker

- **Control**
 - Reduce plant stress
 - Consider tree placement
 - Water adequately
 - Fertilize appropriately
 - DO NOT use fungicides for control

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Deciduous Tree and Shrub Diseases Thousand Cankers Disease

- **Cause:** *Geosmithia morbida*
- **Hosts**
 - Black walnut
 - Other walnuts
- **Favorable environment:** None
- **Transmission**
 - Walnut twig beetle
(*Pityophthorus juglandis*)

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Deciduous Tree and Shrub Diseases Thousand Cankers Disease

- **Control**
 - DO NOT transport walnut wood/products from areas known to have the disease
 - Remove and destroy (burn) affected trees (assisted by WI DATCP and USDA APHIS)
 - No effective fungicide strategies known
 - No effective insecticide strategies known
 - Contact the PDDC if you believe you have found this disease!

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Deciduous Tree and Shrub Diseases Fire Blight

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

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Deciduous Tree and Shrub Diseases

Fire Blight

- **Control**
 - Plant resistant varieties
 - “Home Fruit Cultivars for Northern Wisconsin” (<https://learningstore.uwex.edu/>)
 - “Home Fruit Cultivars for Southern Wisconsin” (<https://learningstore.uwex.edu/>)
 - “Top Ornamental Crabapples for Wisconsin” (<https://pddc.wisc.edu/fact-sheet-listing-all/>)
 - Prune diseased branches

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Deciduous Tree and Shrub Diseases

Fire Blight

- **Control**
 - Decontaminate pruning tools (70% alcohol, disinfectants, 10% bleach)
 - Destroy infected materials
 - Burn (where allowed)
 - Deep bury
 - DO NOT over-fertilize with nitrogen

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Deciduous Tree and Shrub Diseases

Fire Blight

- **Control**
 - Use bactericides to prevent infections (?)
 - Copper, streptomycin
 - Apply during flowering
 - Apply every 7-14 days (3-4 days)

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Deciduous Tree and Shrub Diseases

Bacterial Canker

- **Causes**
 - *Pseudomonas syringae* pv. *syringae*
 - *Pseudomonas syringae* pv. *mors-prunorum*
- **Hosts:** Stone fruits (plum, cherry, peach)
- **Favorable environment**
 - Wet weather
 - Cold temperatures
 - Wounding

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Deciduous Tree and Shrub Diseases

Bacterial Canker

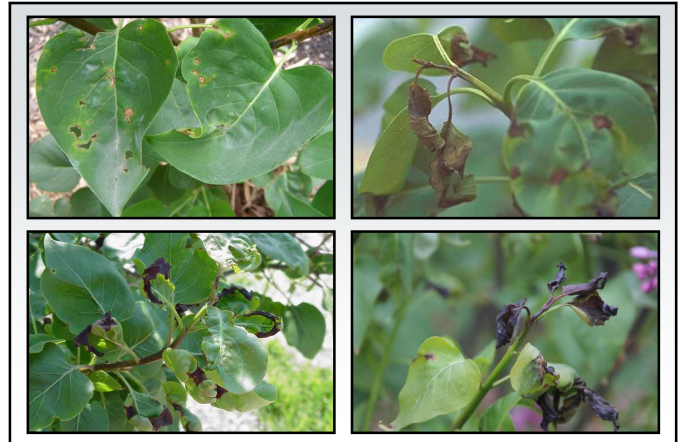
- **Control**
 - Minimize wounding
 - Prune diseased branches
 - Decontaminate pruning tools (70% alcohol, disinfectants, 10% bleach)
 - Destroy infected materials
 - Burn (where allowed)
 - Deep bury
 - DO NOT use bactericides

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Deciduous Tree and Shrub Diseases Bacterial Blight

- Cause: *Pseudomonas syringae* pv. *syringae*
- Host
 - Lilac
 - Other trees and shrubs
- Favorable environment
 - Wet weather
 - Cold temperatures

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Deciduous Tree and Shrub Diseases Bacterial Blight

- Control
 - Space lilacs to promote good air flow
 - Reduce stress
 - Avoid overhead watering
 - Prune diseased branches
 - Decontaminate pruning tools (70% alcohol, disinfectants, 10% bleach)

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Deciduous Tree and Shrub Diseases Bacterial Blight

- Control
 - Destroy infected materials
 - Burn (where allowed)
 - Deep bury
 - Use bactericides to prevent infections
 - Copper + mancozeb
 - Apply starting at bud break, 2-3 times at 7 to 10-day intervals

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Deciduous Tree and Shrub Diseases Ash Yellows

- Cause: Ash yellows phytoplasma (*Candidatus Phytoplasma fraxini*)
- Hosts
 - White ash
 - Green ash
 - Other ash
 - Lilac

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Deciduous Tree and Shrub Diseases Ash Yellows

- Favorable environment
 - High leafhopper populations (*Scaphoideus*)



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Deciduous Tree and Shrub Diseases Ash Yellows

- **Control**
 - Make infected trees comfortable until they die
 - Remove infected trees
 - Destroy infected materials
 - Burn (where allowed)
 - Deep bury
 - Avoid growing susceptible trees and shrubs

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Deciduous Tree and Shrub Diseases Root/Crown Rots

- **Pathogens**
 - *Rhizoctonia solani*
 - *Fusarium* spp.
 - *Cylindrocarpon* spp.
 - *Pythium* spp.
 - *Phytophthora* spp.
- **Hosts:** Any deciduous tree or shrub
- **Favorable environment:** Cool, wet soils

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Deciduous Tree and Shrub Diseases Root/Crown Rots

- **Control**
 - Moderate soil moisture
 - Grow trees and shrubs in well-drained sites
 - Use a soil with adequate drainage
 - Improve drainage in poorly drained soils
 - Add organic matter to improve drainage
 - Use raised beds
 - DO NOT overwater
 - DO NOT overmulch

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Deciduous Tree and Shrub Diseases Root/Crown Rots

- **Control**
 - DO NOT move contaminated soil or plants
 - Decontaminate infested tools, pots, work areas
 - Pretest soils/mulches/composts
 - Use soil-less potting mixes for containerized plants

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Deciduous Tree and Shrub Diseases Root/Crown Rots

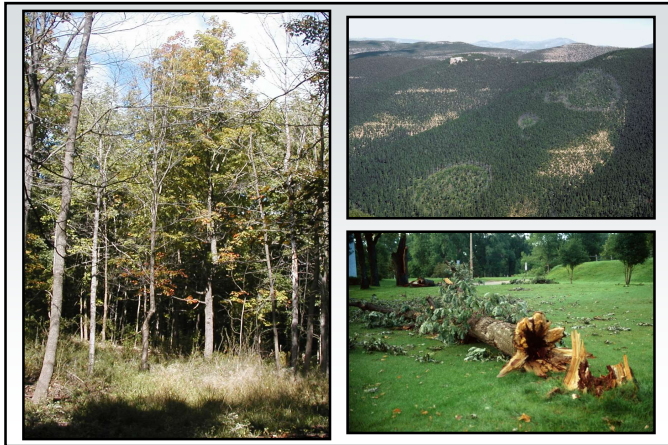
- **Control**
 - Use fungicides to prevent infections
 - PCNB, thiophanate-methyl, fludioxonil, Etridiazole, metalaxyl/mefenoxam, fosetyl-Al
 - Use granular formulations if possible
 - Use during periods of wet weather
- Use biopesticides to prevent infections
 - *Trichoderma*, *Gliocladium*
 - Use for potted plants

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Deciduous Tree and Shrub Diseases Armillaria Root Disease

- **Pathogens:** *Armillaria* spp.
- **Hosts**
 - Many deciduous trees and shrubs
 - Many conifers
- **Favorable environment**
 - Drought stress
 - Defoliation stress
 - Other stresses

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Deciduous Tree and Shrub Diseases Armillaria Root Disease

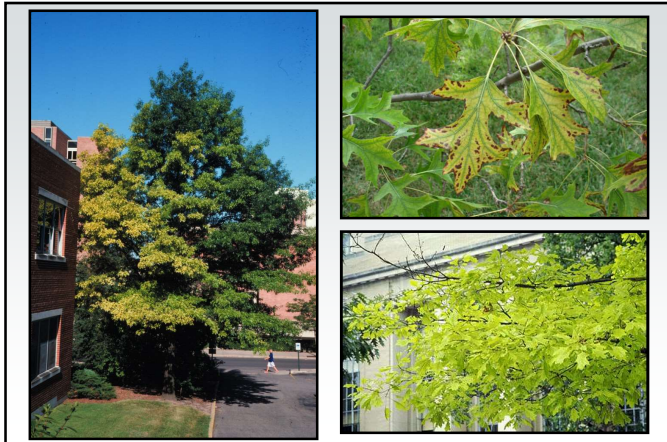
- **Control**
 - Reduce tree/shrub stress where possible
 - Water adequately
 - Fertilize properly
 - Control foliar pathogens
 - Control foliar insect pests
 - DO NOT wound trees
 - Remove *Armillaria*-infested materials
 - DO NOT use fungicides

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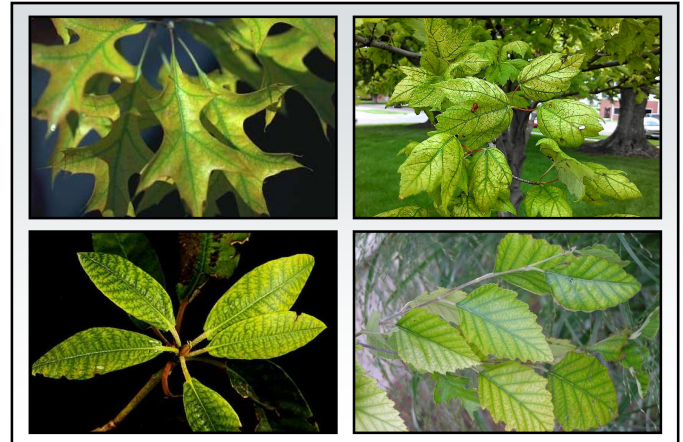
Deciduous Tree and Shrub Diseases Chlorosis

- **Cause:** Micronutrient (Fe or Mn) deficiency
- **Affected plants**
 - Oaks (especially pin oak)
 - Red Maples
 - Rhododendrons
 - Other woody (and herbaceous) plants

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Deciduous Tree and Shrub Diseases 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

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Deciduous Tree and Shrub Diseases Herbicide Injury

- **Causes**
 - Growth regulator herbicides
 - 2,4-D
 - Dicamba
 - Imprelis!
 - Other herbicides
- **Affected plants: Anything and everything**

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Deciduous Tree and Shrub Diseases Herbicide Injury

- **Management**
 - Apply herbicides only when needed
 - Follow application directions exactly
 - Apply herbicides only when wind speed is low (< 5 mph)
 - DO NOT apply herbicides too close to nontarget plants
 - Apply herbicides at low pressure

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Deciduous Tree and Shrub Diseases

Herbicide Injury

- **Management**
 - Use amine rather than ester forms of herbicides
 - Adequately test herbicides prior to registration!

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Deciduous Tree and Shrub Diseases

Winter Injury

- **Causes**
 - Water stress
 - High winds
 - Extreme winter temperatures
 - Insufficient snow cover
 - Cycling winter temperatures
 - Ice

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Deciduous Tree and Shrub Diseases

Winter Injury

- **Affected plants**
 - Fruit trees
 - Pome fruits (apple, pear)
 - Stone fruits (cherry, plum, peach, apricot)
 - Maples
 - Japanese
 - Korean
 - Redbud

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Deciduous Tree and Shrub Diseases

Winter Injury

- **Management**
 - Water trees and shrubs adequately
 - Plant trees and shrubs
 - Properly
 - In protected locations (sensitive plants)
 - Protect sensitive plants
 - Pray for
 - Lots of snow
 - A slow, gradual spring warm up

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Deciduous Tree and Shrub Diseases

Other Abiotic Disorders



Salt Injury



Tatters



Construction Injury



Water Stress



Girdling Root



Lawn Mower Injury

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Deciduous Tree and Shrub Diseases

Non-Diseases: Fungi/Fungal Allies



Giant Puffballs



Lichens



Stink Horns



Bird's Nest Fungi



Slime Molds

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Deciduous Tree and Shrub 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
<https://pddc.wisc.edu>
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