

Talks for the General Public

Deciduous Tree and Shrub Diseases

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Deciduous Tree and Shrub Diseases Powdery Mildews

• Pathogens

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

Deciduous Tree and Shrub Diseases Powdery Mildews

• Hosts

- Virtually everything
 - Not conifers
- #### • Favorable environment: High humidity



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

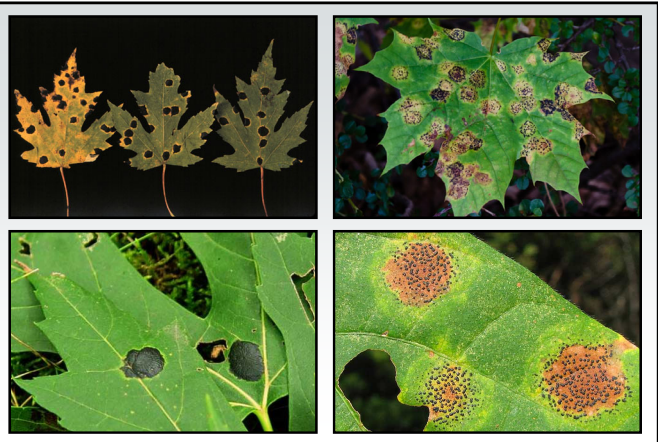
Deciduous Tree and Shrub Diseases Powdery Mildews

• 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

Deciduous Tree and Shrub Diseases Tar Spot

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

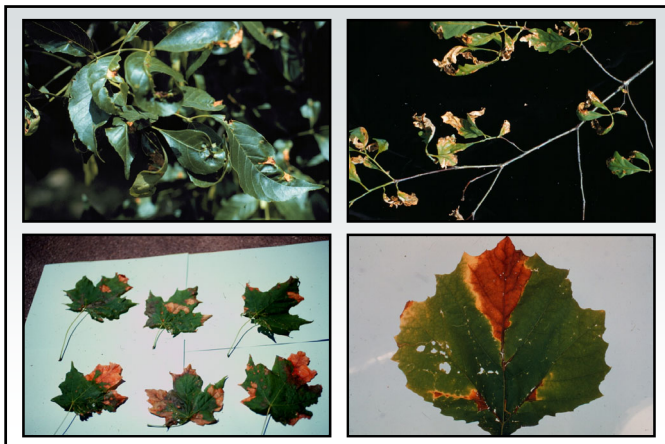


Deciduous Tree and Shrub Diseases Tar Spot

- 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

Deciduous Tree and Shrub Diseases Anthracnose

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



Deciduous Tree and Shrub Diseases Anthracnose

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

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

Deciduous Tree and Shrub Diseases Black Spot

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



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

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, bleach)

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

Deciduous Tree and Shrub Diseases Scab (Apple and Pear)

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



Deciduous Tree and Shrub Diseases Scab (Apple and Pear)

- Control
 - Plant resistant varieties
 - “Home Fruit Cultivars for Northern Wisconsin” (<https://learningstore.extension.wisc.edu/>)
 - “Home Fruit Cultivars for Southern Wisconsin” (<https://learningstore.extension.wisc.edu/>)
 - “Top Ornamental Crabapples for Wisconsin” (<https://hort.extension.wisc.edu/>)

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

Deciduous Tree and Shrub Diseases Scab (Apple and Pear)

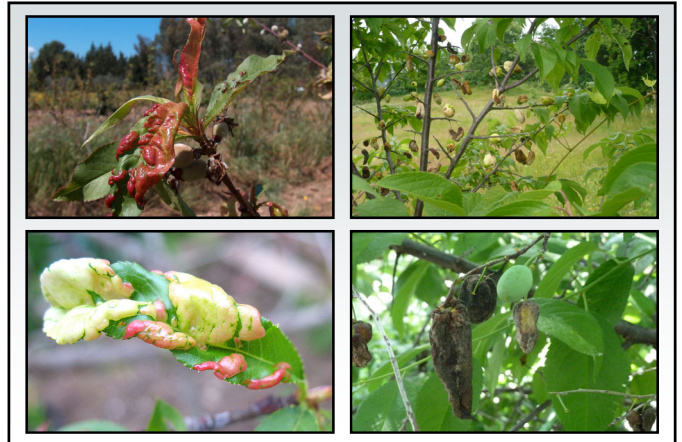
- Control
 - Use fungicides to prevent infections
 - Chlorothalonil, copper, mancozeb, myclobutanil, propiconazole, thiophanate-methyl, sulfur
 - Alternate active ingredients (FRAC codes)
 - Apply from bud break through the end of favorable weather
 - Apply at 7 to 14-day intervals

Deciduous Tree and Shrub Diseases Taphrina Diseases of Stone Fruits

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

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**



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, bleach)

Deciduous Tree and Shrub Diseases
Taphrina Diseases of Stone Fruits

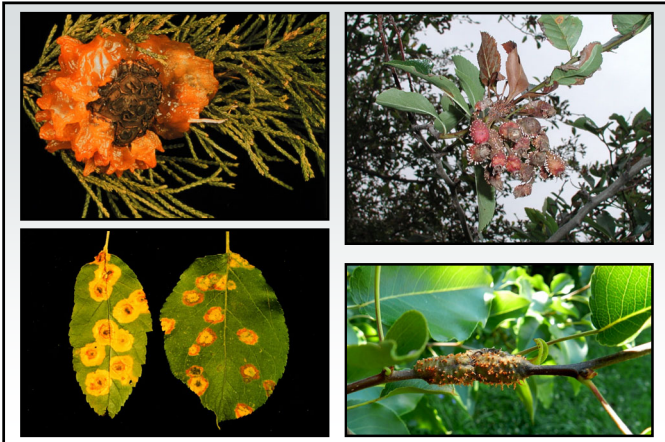
- **Control**
 - Use fungicides to prevent infections
 - Chlorothalonil, copper, ferbam
 - Apply after leaf fall and/or before leaf emergence

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)
 - *Gymnosporangium yamadae* – NEW! (Japanese apple rust)

Deciduous Tree and Shrub Diseases
Gymnosporangium Rusts

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



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>)
 - “Disease and Insect Resistant Ornamental Plants: Juniperus (Junipers)”
(<https://ecommons.cornell.edu/handle/1813/56372.2>)

Deciduous Tree and Shrub Diseases 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/>)

Deciduous Tree and Shrub Diseases Gymnosporangium Rusts

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

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

Deciduous Tree and Shrub Diseases Black Knot

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



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

Deciduous Tree and Shrub Diseases Black Knot

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

Deciduous Tree and Shrub Diseases Crown Gall

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



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, bleach)

Deciduous Tree and Shrub Diseases Crown Gall

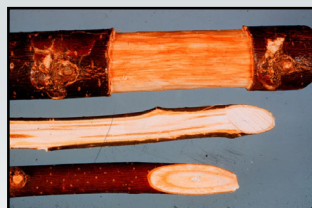
- Control
 - Remove plants (including roots) and soil
 - Destroy infected materials
 - Burn (where allowed)
 - Landfill
 - Plant nonsusceptible plants
 - DO NOT use bactericides

Deciduous Tree and Shrub Diseases Dutch Elm Disease

- Pathogens
 - *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

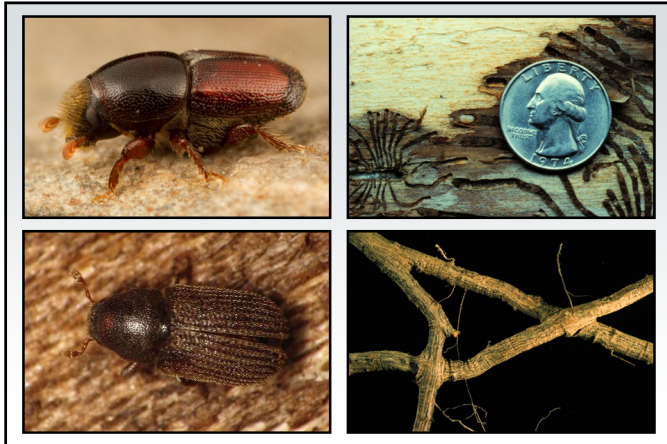
Deciduous Tree and Shrub Diseases Dutch Elm Disease

- 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)



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



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

Deciduous Tree and Shrub Diseases Dutch Elm Disease

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

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

Deciduous Tree and Shrub Diseases Dutch Elm Disease

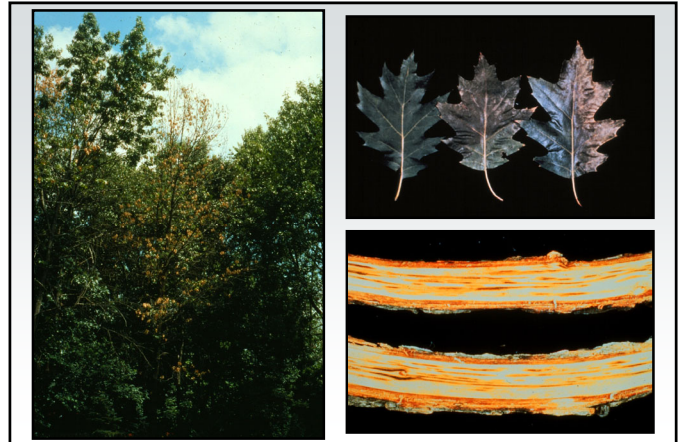
- **Control**
 - Treatments of dubious use
 - Tracing
 - *Verticillium dahliae* injections

Deciduous Tree and Shrub Diseases Oak Wilt

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

Deciduous Tree and Shrub Diseases Oak Wilt

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



Deciduous Tree and Shrub Diseases Oak Wilt

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

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



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.extension.wisc.edu/>)
 - Mechanically (vibratory plow or trenching machine)
 - Chemically (soil fumigant)
 - Physical barriers

Deciduous Tree and Shrub Diseases Oak Wilt

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

Deciduous Tree and Shrub Diseases Oak Wilt

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

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

Deciduous Tree and Shrub Diseases Verticillium Wilt

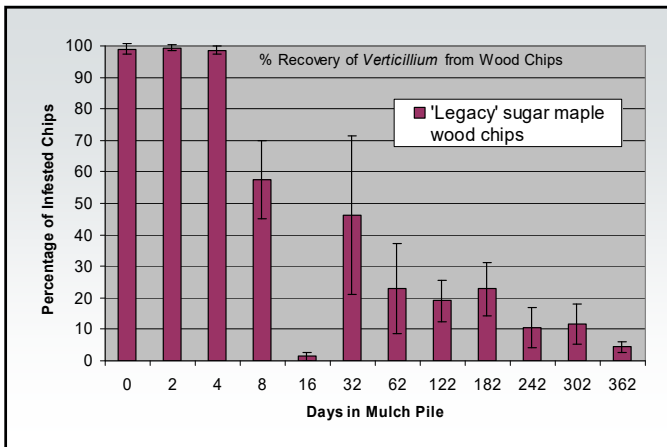
- **Favorable environment**
 - Cool, wet weather (for infection)
 - Hot, dry weather (for symptom development)





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



• 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)

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

Deciduous Tree and Shrub Diseases Nectria Canker

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



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://hort.extension.wisc.edu/>)
 - “How to Properly Prune Deciduous Shrubs” (<https://hort.extension.wisc.edu/>)

Deciduous Tree and Shrub Diseases Nectria Canker

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

Deciduous Tree and Shrub Diseases Golden Canker

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



Deciduous Tree and Shrub Diseases Golden Canker

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

Deciduous Tree and Shrub Diseases Golden Canker

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

Deciduous Tree and Shrub Diseases Thousand Cankers Disease

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



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!

Deciduous Tree and Shrub Diseases Fire Blight

- Pathogen: *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)



Deciduous Tree and Shrub Diseases Fire Blight

- Control
 - Plant resistant varieties
 - “Home Fruit Cultivars for Northern Wisconsin” (<https://learningstore.extension.wisc.edu/>)
 - “Home Fruit Cultivars for Southern Wisconsin” (<https://learningstore.extension.wisc.edu/>)
 - “Top Ornamental Crabapples for Wisconsin” (<https://hort.extension.wisc.edu/>)
 - Prune diseased branches

Deciduous Tree and Shrub Diseases Fire Blight

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

Deciduous Tree and Shrub Diseases Fire Blight

- Control
 - Use bactericides to prevent infections (?)
 - Copper, streptomycin
 - Apply
 - Pre-bloom (copper)
 - During flowering (streptomycin)
 - Apply every
 - Two applications at spaced 4 days apart (copper)
 - Multiple applications spaced 3-4 days apart (streptomycin)

Deciduous Tree and Shrub Diseases Bacterial Canker

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

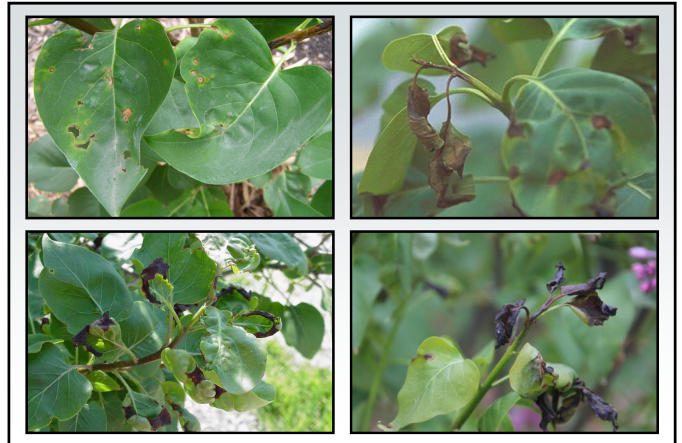


Deciduous Tree and Shrub Diseases Bacterial Canker

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

Deciduous Tree and Shrub Diseases Bacterial Blight

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



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, bleach)

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

Deciduous Tree and Shrub Diseases Ash Yellows

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

Deciduous Tree and Shrub Diseases Ash Yellows

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



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

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



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

Deciduous Tree and Shrub Diseases Root/Crown Rots

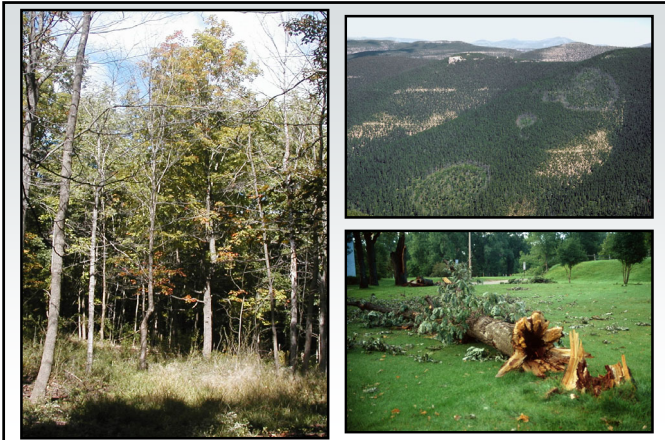
- **Control**
 - DO NOT move contaminated soil or plants
 - Decontaminate infested tools, pots, work areas
 - Pretest soils/mulches/composts
 - Use soil-less potting mixes for containerized plants

Deciduous Tree and Shrub Diseases Root/Crown Rots

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

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

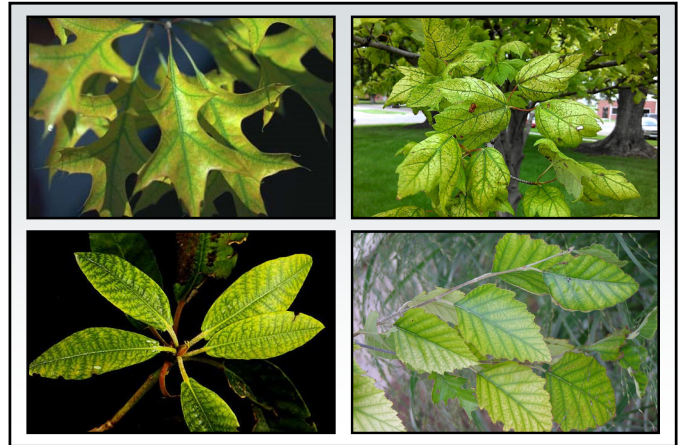
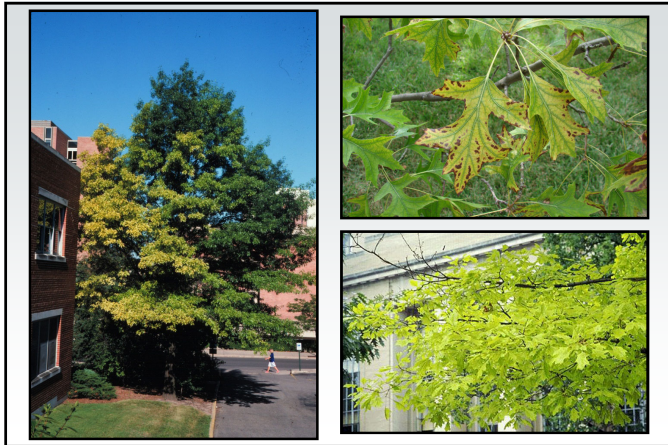


Deciduous Tree and Shrub Diseases Armillaria Root Disease

- **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

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



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

Deciduous Tree and Shrub Diseases Herbicide Injury

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



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

Deciduous Tree and Shrub Diseases Herbicide Injury

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

Deciduous Tree and Shrub Diseases Winter Injury

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

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










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

Deciduous Tree and Shrub Diseases Other Abiotic Disorders

		
Salt Injury	Tatters	Construction Injury
		
Water Stress	Girdling Root	Lawn Mower Injury

Deciduous Tree and Shrub Diseases Non-Diseases: Fungi/Fungal Allies

		
Giant Puffballs		Stink Horns
		
Bird's Nest Fungi	Lichens	Slime Molds

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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