



RUTGERS
THE STATE UNIVERSITY
OF NEW JERSEY



2025 Ornamental IPM Program Webinar

Contemporary IPM Topics and Management

August 26, 2025

Bill Errickson & Steve Rettke (Monmouth)

Tim Waller (Cumberland)

Support: Erin Quinn

Cooperating Agencies: Rutgers, The State University of New Jersey, U.S. Department of Agriculture, and Boards of County Commissioners, Rutgers Cooperative Extension, a unit of the Rutgers New Jersey Agricultural Experiment Station, is an equal opportunity program provider and employer.

TODAYS SPEAKERS

Bill Errickson (Ag. Agent - Monmouth County RCE)

Steve Rettke (IPM Program Associate – Monmouth County RCE)

Tim Waller (Ag. Agent – Cumberland County RCE)

Erin Quinn (IPM Program Support)

Disclaimer - Materials do not cover all possible control scenarios and are intended for licensed professionals. Tradenames do not imply endorsement and are used as examples. You must strictly follow the label for each compound prior to use. Rutgers is not responsible for misused materials or damages thereof. The label is the law. Labels will provide detailed information on use and restrictions. Additionally, application intervals, compatibility, surfactant use, PHI, PPE, important and other key information is described in detail. Always discuss treatments with your local agents. **Note: Neonicotinoids can only be legally applied in commercial agriculture settings by licensed applicators.** Guidelines and recommendations made in this presentation are specific to the state of New Jersey.

Agenda (8/26/2025)



1. Beneficial insect: Dragonflies
2. Leafcutter bees
3. Fleahopper
4. Nostoc
5. Nickel deficiency in River Birch
6. Tulip tree & Magnolia soft scales
7. Douglas-fir needle midge
8. Slugs/snails
9. Banded ash clearwing moth borer
10. Verticillium wilt

Current GDD: 8/26/25
North NJ: 2510 GDDs
Central NJ: 2720 GDDs
Southern NJ: 2875 GDDs

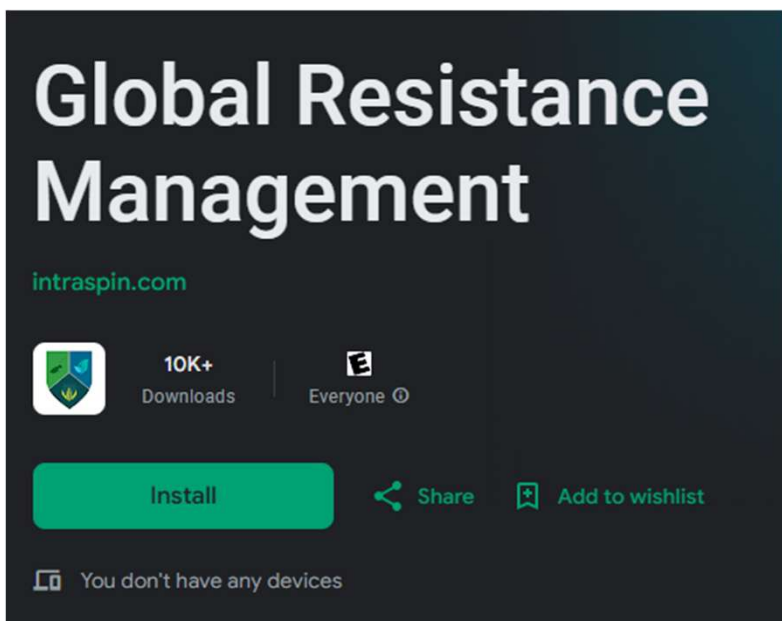
Updates –

NEW

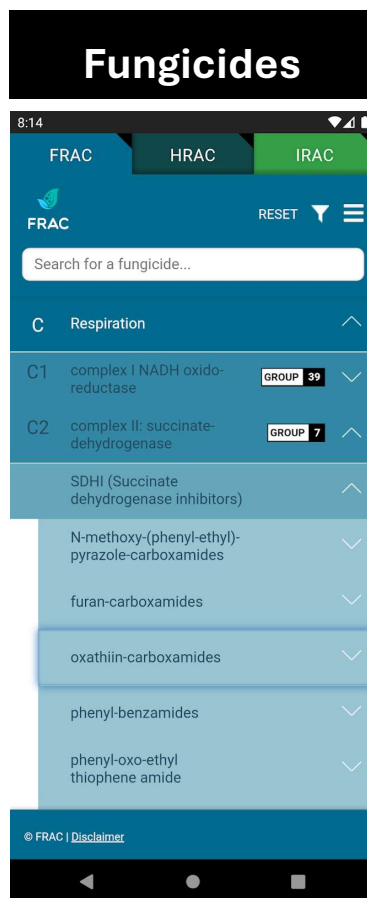
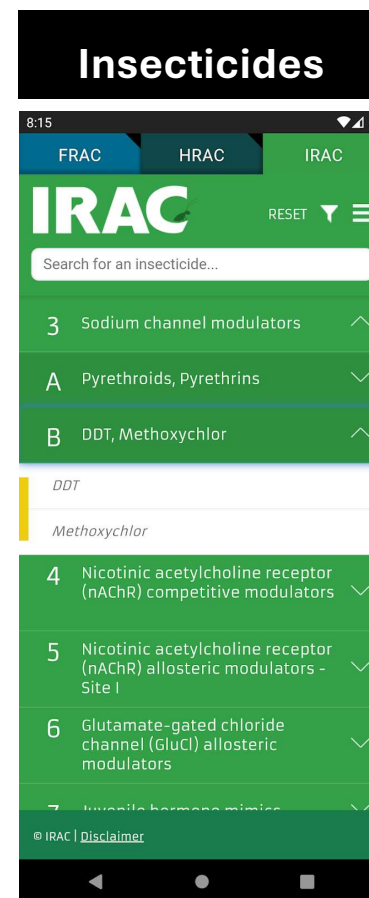
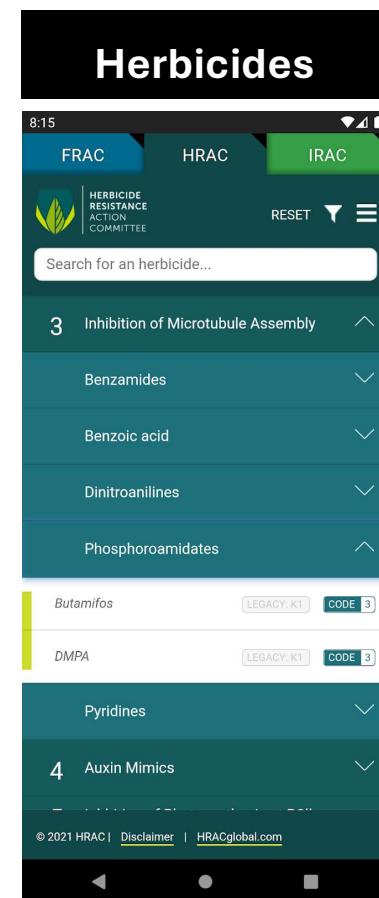
-RAC app



Now there is 1x application for all your
Resistance Action Committee (-RAC) needs



Great for looking up Group #s for
pesticides we use daily



Updates – Japanese maple scale / Redheaded sawfly

Japanese Maple Scale

July 24, 2025 | By [Erin O. Quinn](#) | [Pests](#)



Japanese Maple Scale (*Lopholeucaspis japonica*)

GDD Window (base 50): 800-1200 (1st gen), 2500+ (2nd gen)

<https://sites.rutgers.edu/nursery-ipm/japanese-maple-scale/>

Second generation approaching or now occurring
(visit website QR codes for details)

Redheaded Pine Sawfly

June 16, 2025 | By [Erin O. Quinn](#) | [Pests](#)



Redheaded Pine Sawfly (*Neodiprion lecontei*)

<https://sites.rutgers.edu/nursery-ipm/redheaded-pine-sawfly/>

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<https://sites.rutgers.edu/nursery-ipm/>

Beneficial Insect: Dragonfly (*Anisoptera* spp.)

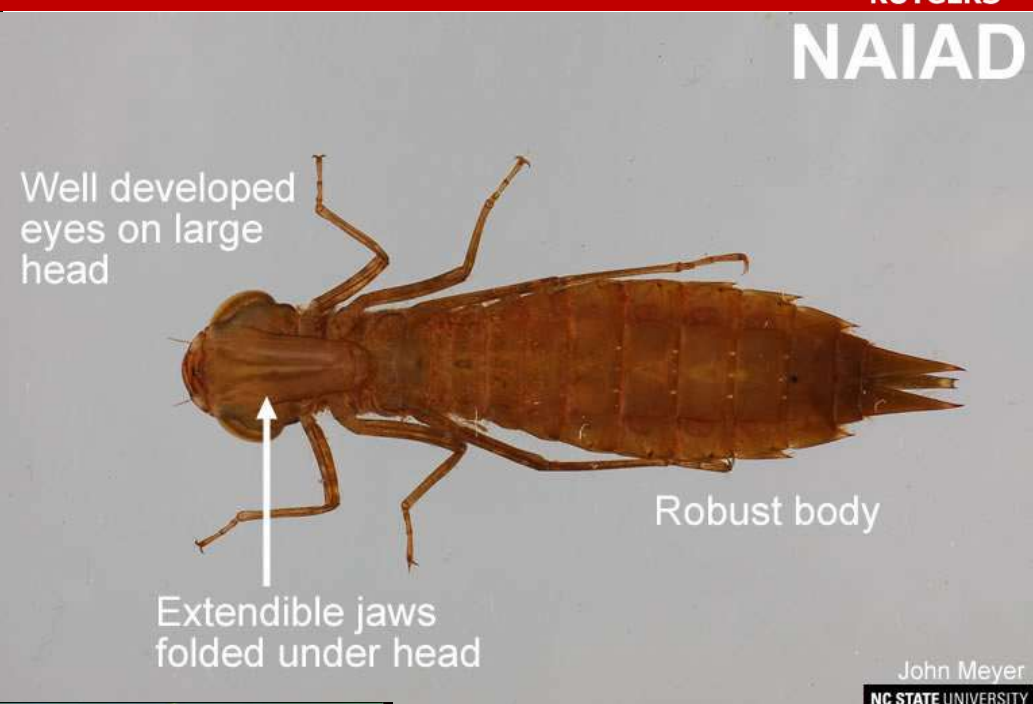
- Adults have a long, narrow abdomen, two tiny antennae and two pairs of large, clear wings that stay open during rest
- Larger species can fly at speeds exceeding 30 mph, making it easy for them to avoid predators and capture prey
- Large compound eyes with a nearly 360-degree field of view and ultraviolet vision allows them to catch prey in midair with a 95% success rate
- Many existing species, coming in different colors and sizes
 - **Percher types make frequent stops in a small range**
 - Patroller types have constant motion within a larger range
- Lay their eggs in mud or water
- Nymphs hatch within a few weeks and live in water for up to two years
- Nymphs (naiads) crawl out of the water when they are grown so that adults can emerge from the nymphal skin
- Nymphs have large heads and well-developed eyes, and extendible mandibles that can catch prey from a long distance away
- Only a few species are migratory
- Adults live 2-3 months
- The life cycle is one to several years long
- Nymph prey: aquatic insects, mosquito larvae, tadpoles, small fish
- Adult prey: mosquitoes, flies, butterflies and moths, bees, wasps, & other flying insects



Photo Credit: Steven K. Rettke, RCE

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Beneficial Insect: Dragonfly (*Anisoptera* spp.)



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Beneficial Insect: Dragonfly (*Anisoptera* spp.)



Fostering Dragonfly Populations

- A permanent water source
- Diverse vegetation (including aquatic and terrestrial plants, and native plants which will attract prey and provide food for the dragonflies)
- Perches and sunny spots for resting and hunting
- Avoid removing all leaf litter from the habitat

Pesticide Impacts / Considerations

- Avoid or reduce use of broad-spectrum insecticides
- Spray only when necessary
- Apply pesticides directly to the pests rather than spraying the entire site
- Opt for reduced risk pest control methods when available
- Applicators **MUST** follow label instructions for in-bloom applications for any insecticide

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Leafcutter bees (*Megachile mendica*)

GDD window uncertain: *First observations late spring – persisting throughout season*

- About the size of a honeybee but are mostly black with white bands on the abdomen
- Females have a “pollen basket” of long hairs on their lower abdomen which they use to transport pollen
- Solitary insects which construct nests in preexisting narrow cavities
- Females construct their nests using foliage and flowers to make the half-inch long cells, cutting round pieces for the base and oval pieces for the walls, and lining them with petal fragments before filling them with pollen and nectar
- Females lay eggs on the pollen mass and then cap the cell with foliage pieces
- Young bees chew their way through the nest after they hatch
- Grubs are pale and legless, before molting into prepupa, spinning a silken cocoon that eventually turns dark brown before pupae emerge and then finally molt to become adults
- The final eggs laid during the season will hatch and then overwinter within their cocoons, where warming temperatures will induce pupae to emerge
- **Host plants:** Many different plants, including those with flowers for pollen and nectar, and plants with petals and leaves that are somewhat malleable for nest building (**Red Bud (*Cercis*)** is most commonly seen host plant in nurseries)

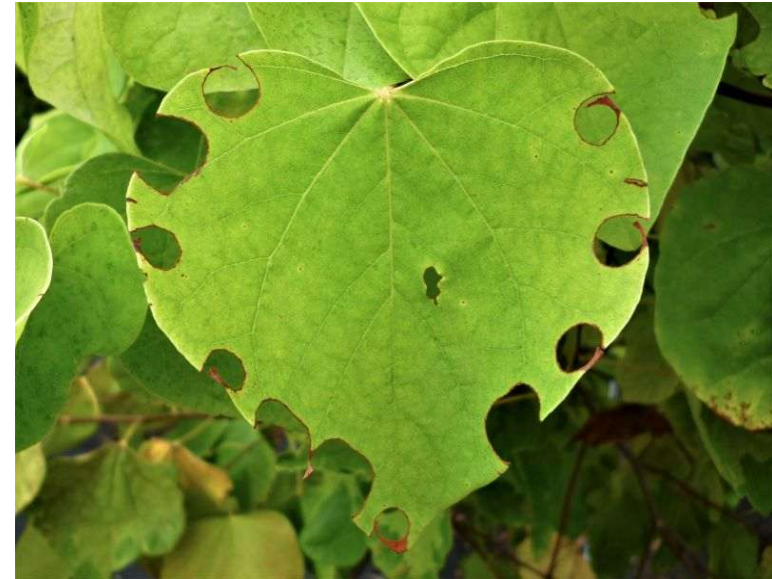
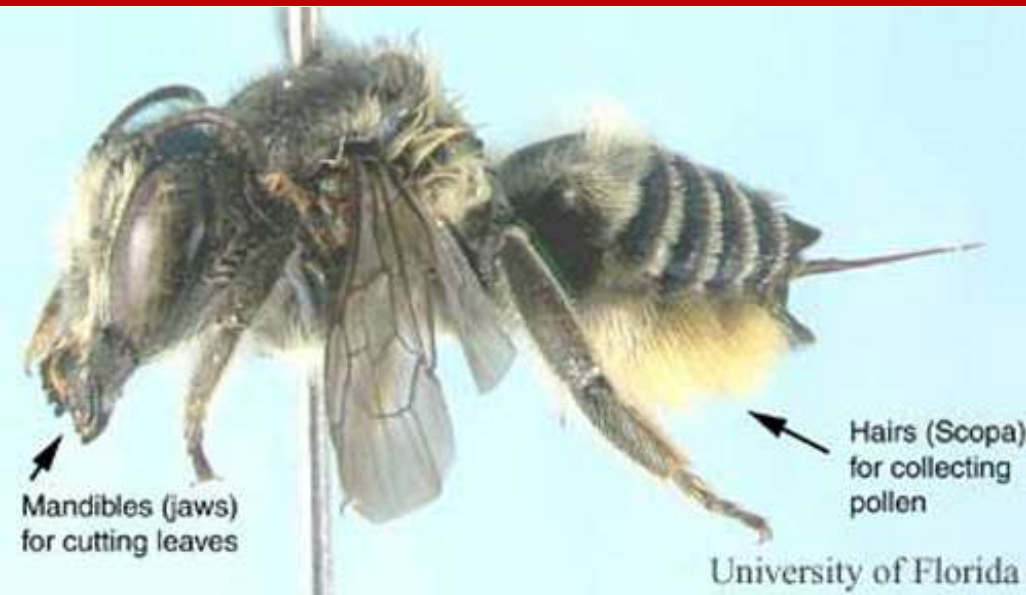
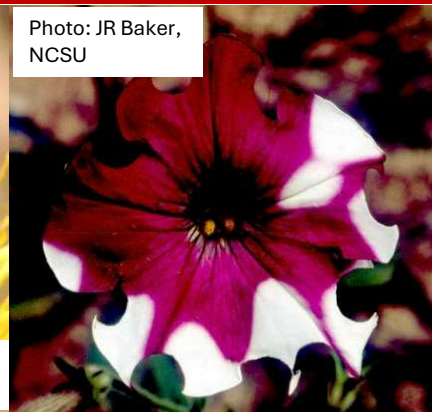


Photo Credit: Steven K. Rettke, RCE

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Leafcutter bees (*Megachile mendica*)



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Leafcutter bees (*Megachile mendica*)

GDD window uncertain: *First observations May – persisting throughout season*

Management

- **Cultural Practices:**

- **Natural predators:** parasitoids, flies, wasps, and beetles, acrobat ants
- *Coelioxys* is a leafcutting bee which lays their eggs in the nests of other leafcutter bees, and then these bees will eat the young of the bees originally in the nest
- **Avoid treatment when possible**
 - **They are superior pollinators to other bees,** especially for apples and legumes (specifically alfalfa)
 - They have no nest guarding instinct and rarely sting
- Cover susceptible plants with cheesecloth or loose netting to deter leafcutter bees
- Cover pruned rose cane ends with thumb tacks, glue, or wax to prevent bees from tunneling
- Fill holes in wood that could be used for nesting
- Remove decaying wood where bees may nest



A male *Coelioxys* sleeping on a stem. *Coelioxys* bees are nest parasites of leafcutter bees.

Photo by J. R. Baker, NC State University

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Fleahopper (*Microtechnites bractatus*)

GDD window uncertain: *First observations May – persisting throughout season*

- **Host plants:** Wide range, including ornamental, garden, and forage plants, as well as weeds and grasses
- Small plant bugs that are about the size of fleas and jump around quickly to escape predators
- Usually 1/8" long, and typically black with long antennae, wings, and piercing-sucking mouthparts
- Females have shorter wings than males
- Males have white spots
- Overwinter as eggs laid in stems or leaves so that the tip of the egg is on the surface
- Newly hatched nymphs are pale green, becoming darker green as they grow and molt more
- Adults live from 1 to 3 months, and there can be 5 or more generations per year
- Cause pale spots on upper leaf surface and spots of excrement on the lower surface
- Can cause leaves to become chlorotic and drop prematurely

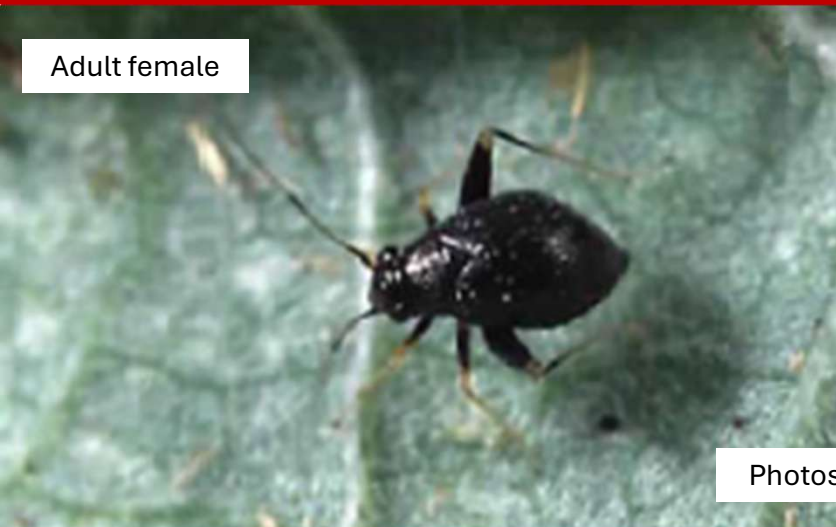


Photo via P. Choate

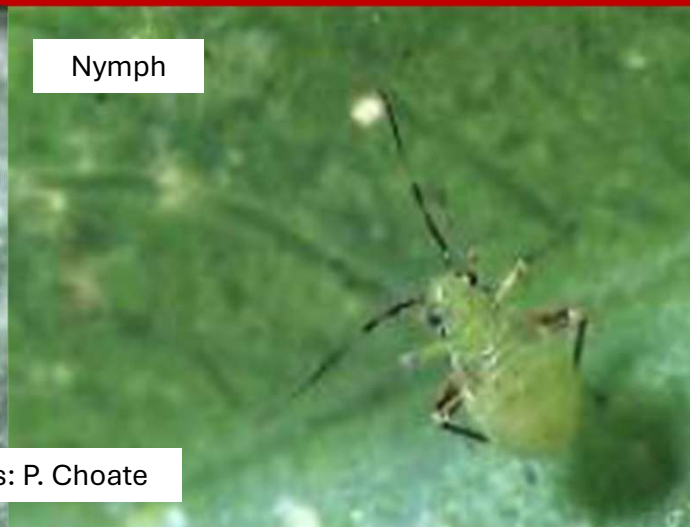
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Fleahopper (*Microtechnites bractatus*)

Adult female



Nymph



Adult male



Photos: P. Choate

Photos: JR Baker



Photo: G. Ghidui



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Fleahopper (*Microtechnites bractatus*)



Susceptibility to flea hopper damage

High

- Buddleia
- Salvia

Medium/High

- Monarda
- Agastache
- Phlox
- Nepeta
- Helenium
- Veronica

Medium/Low

- Ajuga
- Alcea
- Aquilegia
- Scabiosa

Low

- Clematis
- Hydrangea
- Spiraea

Fleahopper (*Microtechnites bractatus*)

Symptoms on *Buddleia* upper leaves



Signs on *Buddleia* lower leaves



Photo Credits: Steven K. Rettke

Fleahopper (*Microtechnites bractatus*)



GDD window uncertain: *First observations May – persisting throughout season*

Management

• **Cultural Practices:**

- **Natural predators:** parasitic wasps, ladybugs, lacewings, minute pirate bugs, assassin bugs, spiders, nematodes
- Remove weeds in the area
- Crop rotation
- Dispose of debris and waste
- Floating row covers

Materials

• **Contact insecticides:**

- Pyrethroids [3]: -thrins
- Carbamates [1A]: Carbaryl

• **Systemic insecticides:**

- **Organophosphates [1B]: Acephate**

• **Considerations:**

- Can harm non-target species
- Infestations are sporadic so one application may bring extended periods of relief
- May need a second application 5-7 days after the first one because eggs are protected within the plant tissue

Biorationals:

- Spinosyns [5]: Spinosad

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Middleman Topics (8/26/2025)



- 1. Nostoc**
- 2. Nickel deficiency in river birch**
- 3. Magnolia vs. Tulip tree soft scales**
- 4. Douglas-fir needle midge**

Nostoc (*Nostoc* spp.)

- A **cyanobacterium**, and one of the oldest organisms on earth
- **Primitive growth**, like algae, moss, and liverwort
- No roots, no vascular tissues, and is not a plant, but it is photosynthetic
- Forms **gelatinous masses** composed of **filaments** linked together by protective **jelly-like coverings**
- **Poses slipping hazards**
- Hundreds of species, can be aquatic or terrestrial

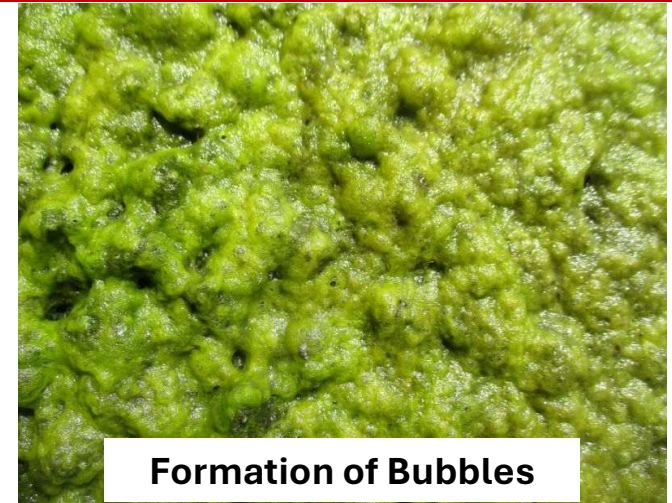


Photo via Steven K. Rettke, RCE

Nostoc (*Nostoc* spp.)

- Can be found growing in gravel, stones, limestone chips, granite, saturated soils, and **on-ground cloth within container nurseries**
- Can tolerate long periods of desiccation but requires lots of water for establishment
- Growth can become common and persistent at certain **nursery/greenhouse sites where long-term overhead irrigation is done**
- Not toxic, and does not compete with plants, but can harbor fungus gnats and snails

Photos via Steven K. Rettke, RCE



Formation of Bubbles



Masses of gelatinous filaments

Photo credits Steve Rettke, Rutgers RCE unless otherwise noted

Nostoc (*Nostoc* spp.)

(Moss example)



(Slipping hazard)



(Slipping hazard)



(Desiccated)



(Desiccating)



(Slipping hazard)



Nostoc (*Nostoc* spp.)

Management

- **Cultural Practices:**
 - Mechanical raking
 - Blowers
 - Ensure proper drainage
 - Introduce beneficial microbes to outcompete Nostoc
 - Solarizing

Materials

- **Contact herbicides:**
 - **Glufosinate (Finale XL) (best post-emergent herbicide available to control *Nostoc*)**
 - Copper Ethanolamine Complex [M01]
 - Copper Hydroxide [M01]
 - Ammonium chloride sanitizing agents [NC]
 - Diuron (Direx)
- **Considerations:**
 - Many herbicides do not work well
 - Species at different locations can cause different control results
 - **Nostoc must be hydrated for post controls to work**



Photo via Steven K. Rettke, RCE

Nickel Deficiency in River Birch

Comparison between Normal vs. Witches' broom growth



Photos via Steven K. Rettke, RCE

Nickel Deficiency in River Birch



- **Host plants:** River birch (*Betula nigra*) in soilless media containers when pH is greater than 6.8
- **Witch's broom symptoms can occur**
- Young leaves emerge as brown around the edges, and are smaller and curved in on themselves (“mouse-eared” or “little leaf”)
- **Symptoms:** Leaf chlorosis, dwarfed foliage, blunt leaf tips, leaf necrosis, brittle shoots, injuries that look like cold-injuries, and dead and fibrous roots
- **Rarely will nickel deficiencies occur in mineral soils**
- **When planted from a container into mineral soil, existing symptoms will usually disappear**

Nickel Deficiency in River Birch

Stunted, deformed leaf growth



Photos via Steven K. Rettke, RCE

Nickel Deficiency in River Birch



- Caused by the tree having a difficult time removing excess urea, resulting in acid buildup
- Heavy metals compete with nickel for uptake in the roots of plants
- Accumulation of other elements from previous fertilizer applications can cause nickel uptake to be limited
- Root damage by root-knot nematodes or dry and/or cool soils at bud break can also cause nickel deficiencies
- **Keep container media pH below 6.8**
- **To treat it, apply nickel sulfate (foliar or drench application), being sure not to over-apply**

Nickel Deficiency in River Birch

Stunted, deformed leaf growth



Photos via Steven K. Rettke, RCE

Nickel Deficiency in River Birch

Photos: Newport Tree Conservancy



- Only a small amount of nickel sulfate is necessary for treatment.
- Be sure to spray the entire plant evenly for proper treatment

Tulip Tree & Magnolia Scales



Tulip Tree Scale

GDD Window (base 50): 2032-2629

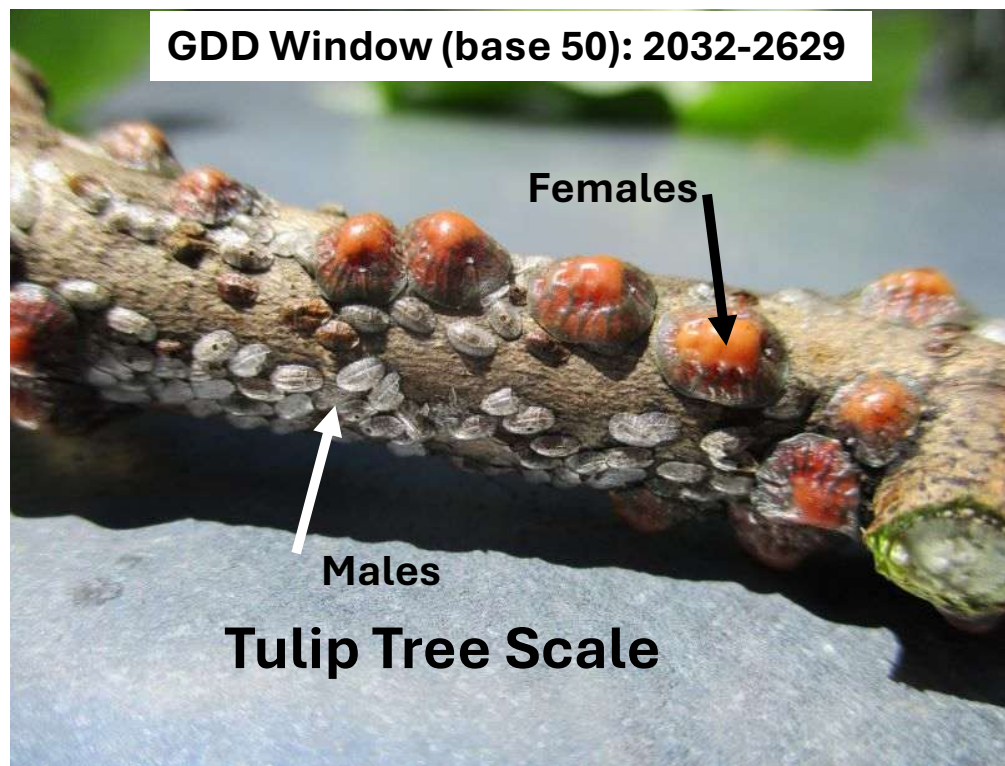
Magnolia Scale

GDD Window (base 50): 2155-2800

- **These scales emerge in August and September rather than June & July, as most other soft scale species**
- By mid-September, the scales have been undergoing crawler emergence for about a month (Only one generation per year)
- Both scales are found exclusively on woody tissues during all life stages
- **Large mature females use their piercing sucking mouthparts to withdraw large quantities of sap from the phloem and exude honeydew that grows sooty mold (attracts ants, wasps, bees & other vespids)**
- Causes yellowing leaves and premature leaf drop & branch decline

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Tulip Tree & Magnolia Scales



Photos via Steven K. Rettke, RCE

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Tulip Tree Scale

(*Toumeyella liriodendri*)

GDD Window (base 50): 2032-2629

- **Host plants:** Found on tulip and magnolia trees, and occasionally yellow poplar, and linden
- Mature females have a hemispherical, helmet-like shape & are orange in color
- **Crawlers emerge ~ 1-wk before Magnolia scale crawlers**
- Crawlers are dark & about 0.5mm long
- Crawlers die if they do not find a host within three days
- **Overwinters as dark 2nd instar nymphs on 1–2-year-old branches**

Magnolia Scale

(*Neolecanium cornuparvum*)

GDD Window (base 50): 2155-2800

- **Host plants:** host-specific to the magnolia trees only
- Largest soft scale in North America
- Oval, & convex in shape, yellow-brown & about 1/2-inch diameter as mature females
- Young females are covered with a white powdery wax
- **Crawlers seen ~ 1 wk after Tulip Tree scales**
- 1st instar crawlers are visible without a magnifying hand lens
- **Overwinter as large, dark colored, 2nd-instar nymphs on 1–2-year-old wood**

Tulip Tree & Magnolia Scales

Tulip Tree Scale (crawlers)

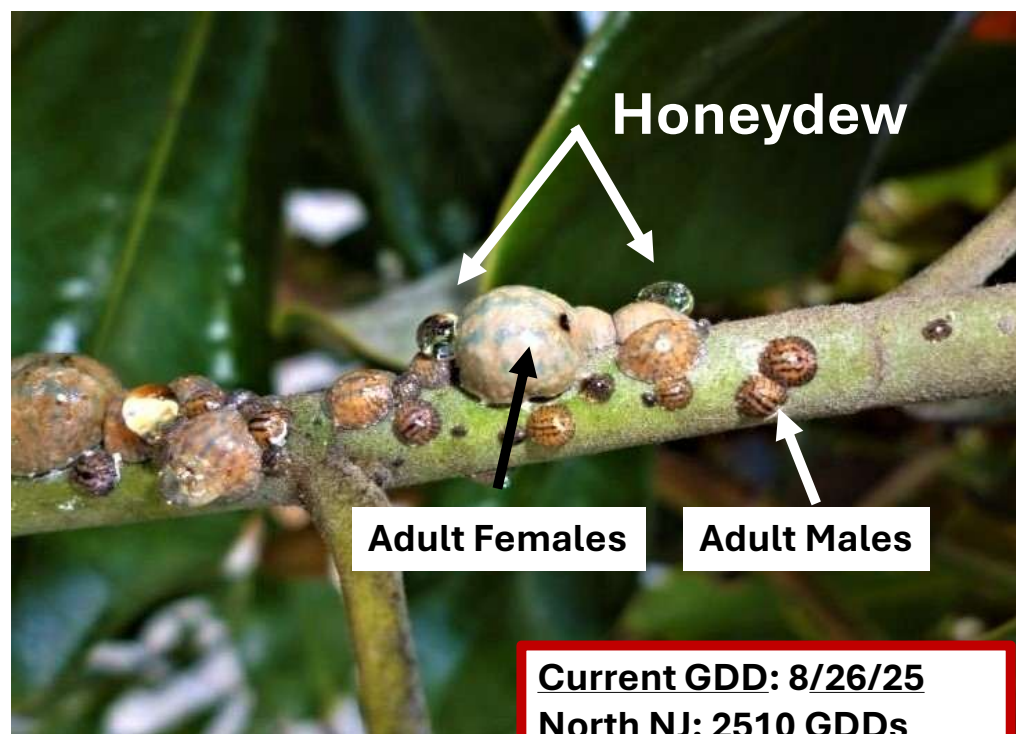
(GDD Window (base 50): 2032-2629)



Photos via Steven K. Rettke, RCE

Magnolia Scale (crawlers)

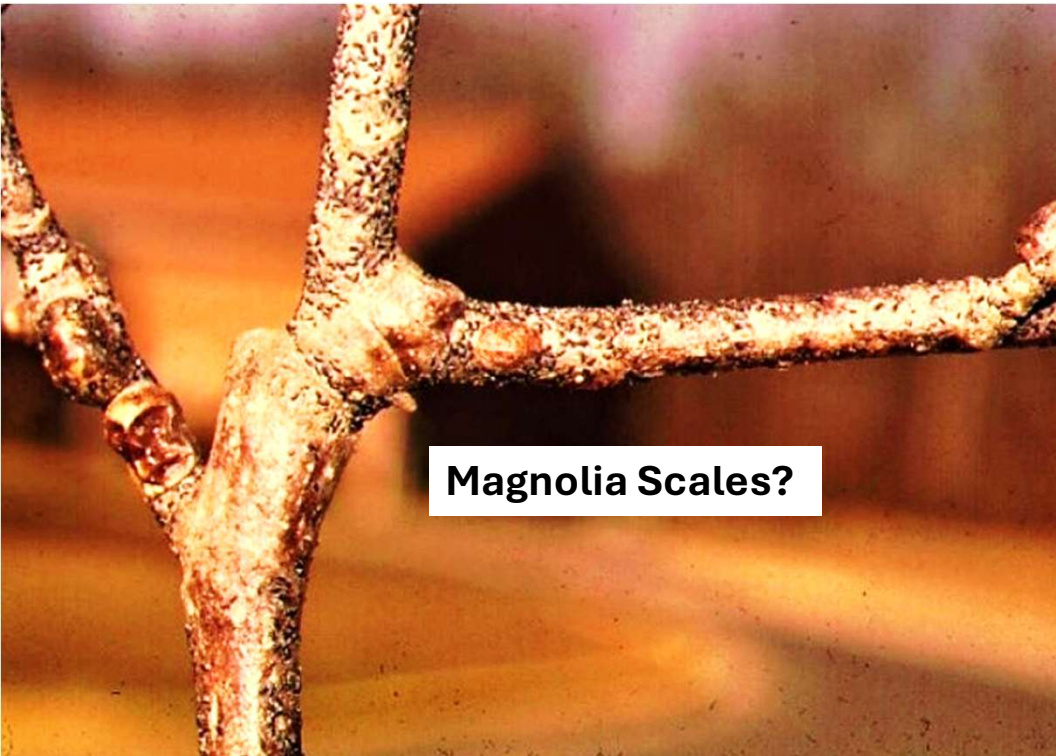
(GDD Window (base 50): 2155-2800)



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Tulip Tree & Magnolia Scales

Overwintering 2nd Instar Nymphs on Branch Stems



Magnolia Scales?

Photo via Steven K. Rettke, RCE



Photo: (Missouri botanical garden.org)

Tulip Tree & Magnolia Scales



Management

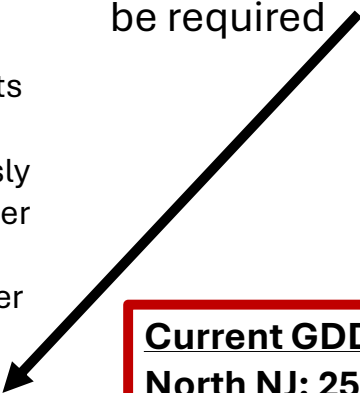
- **Cultural Practices:**
 - **Natural predators:**
ladybeetles, lacewings, parasitoid wasps
 - Use double-sided sticky tape to monitor
 - Reduce plant stress
 - Prune heavily infested branches
 - Regularly monitor for proper timing of controls
- **Control ant populations**
 - **Ants will often protect soft scales because they use honeydew as a food source**

Materials

- **Contact insecticides:**
 - Pyrethroids [3]: -thrins
 - Carbaryl
- **Systemic insecticides:**
 - Neonicotinoids [4A]: imidacloprid, dinotefuran
 - Acephate (tranlaminar)
- **Considerations:**
 - Can harm non-target species-
 - Unsightly appearance of sooty mold often causes people to apply treatments too early
 - If sprays are applied too early, previously laid eggs may have been protected under the female bodies and may still hatch
 - Sprays can be applied during the crawler period but may require multiple treatments
 - **Sprays can be delayed until mid-October to target vulnerable 2nd instar nymphs**

- Biorationals:

- Horticultural oils or insecticidal soaps will provide good efficacy against 1st or 2nd instars
- Against crawlers, multiple oil/soap applications may be required



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Douglas-fir Needle Midge (*Contarinia pseudotsugae*)

GDD Window (base 50): 200-400 (adult emergence)

- **Host plants: Douglas-firs**
- Larvae reside in the swollen areas of needles
- Often not observed during mid-summer
- Maggot is less than 5 mm in size
- Larvae can be exposed later in the season by opening the swollen area with a sewing needle
- **Larvae drop to the ground in November or December and overwinter in the soil under the tree they infested**



Photo Credit: Steven K. Rettke, RCE

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Douglas-fir Needle Midge (*Contarinia pseudotsugae*)

GDD Window (base 50): 200-400 (adult emergence)

- Pupation occurs in early spring as soil temperatures increase
- **Adults emerge in late April and May**
- Adults can create mating clouds before beginning to lay eggs in the new needle growth
- **Causes a twisted distortion of the needles, with yellow banding & swollen areas**
- Swollen areas turn brown or purple at maturity
- Symptoms mimic the Cooley spruce gall adelgid & some needle cast diseases



Photo Credit: Steven K. Rettke, RCE

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Photo credits Steve Rettke, Rutgers RCE unless otherwise noted



Douglas-fir Needle Midge (*Contarinia pseudotsugae*)

Mid-Spring



Photo: Tracy Olsen PA Dept. Of Ag)

Early Summer



Mid-Late Summer



Late-Fall



Photo: Tracy Olsen PA Dept. Of Ag)

Mid-Fall



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Douglas-fir Needle Midge (*Contarinia pseudotsugae*)

GDD Window (base 50): 200-400 (adult emergence)

Management

- **Cultural Practices:**
 - **Natural predators:** parasitoids (*Platygaster* and *Gastancistrus* parasitic wasps)
 - **Plant varieties with a delayed bud break**
 - Increase tree diversity
 - Remove heavily infested trees
 - **Prune heavily infested branches**
- **Materials**
- **Contact insecticides:**
 - Pyrethroids [3]: -thrins
- **Systemic insecticides:**
 - Organophosphates [1B]: acephate
- **Considerations:**
 - Can harm non-target species
 - Determine best treatment window using traps
 - Traps should be placed before late April
 - Detection traps can be made with an upside-down plastic recycling bin
 - Cut a hole in the side of a box to fit a clear empty jar inside
 - Place a dry, crumpled paper towel in the jar to absorb moisture
 - Emerging adults will be attracted to the light coming from the jar
 - **Control sprays should be made within one week of the first catch**
 - **Additional sprays can be made after 10 days**

Photo: Sandy Gardosik, PA Dept. Of Ag



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Snails and Slugs (*Gastropoda* spp.)

- Mollusks that thrive in cool, wet weather
- Soft, slimy bodies which move using a muscular foot while secreting a silvery mucus trail that helps them to move
 - Snails have a visible, coiled shell on their backs, and retract into it when disturbed
 - Slugs lack a shell
- Can be any size from under an inch up to around six inches long
- **Many slugs reach sexual maturity in 3-6 months and lay eggs**
- **Snails can take up to 2 years to reach maturity**
- Eggs are small, white, and often found in clusters in wet, sheltered locations
 - Slug eggs are more translucent and gelatinous than, while snail eggs are harder and more opaque
- Both snails and slugs are hermaphroditic
- Live in no till or zone till areas under the surface layer of debris or mulch
- Slugs and snails feed most actively at night, but can be found on plants anytime conditions are wet
- Damage on herbaceous plants can appear quite suddenly and presents as irregular holes in the middle of the leaf, not along the edges
- Feeding on dormant buds causes new growth to emerge twisted or ragged
- Feed using rasping mouthparts, mostly eating small plants
- **Host plants:** Wide variety of plants, particularly soft-leaved plants and seedlings
 - Hosta, violet, ageratum, dahlias, larkspur, daylily, and any annual/perennial bed that is heavily mulched / moisture laden

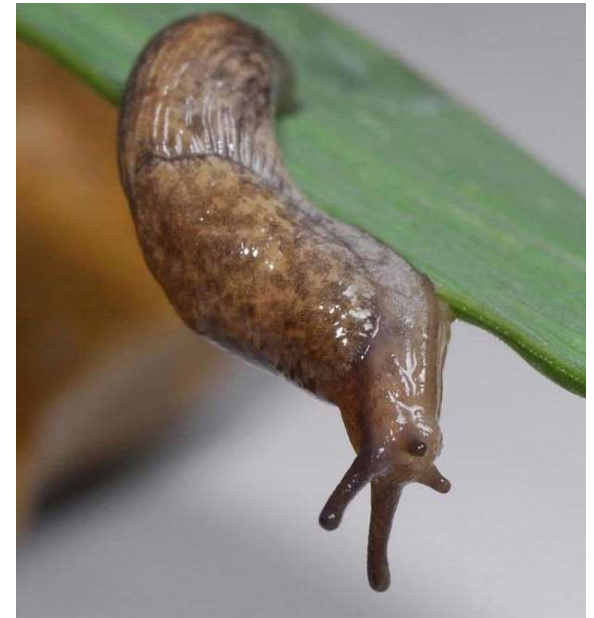


Photo via Joseph Berger, Bugwood.org

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Snails and Slugs (*Gastropoda* spp.)

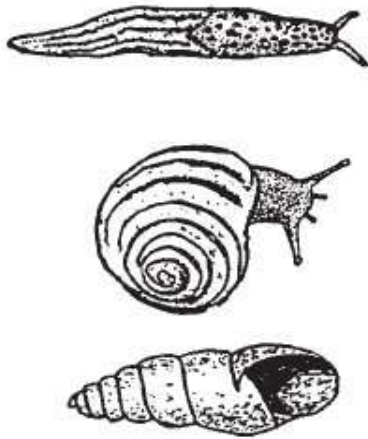


FIG. 1. Top: garden slug, center: garden snail, bottom: decollate snail. (University of Arizona)



Photos: University of
Maryland Extension



Photo: UMN Extension



© G M Dill

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Snails and Slugs (*Gastropoda* spp.)



GDD Window (base 50): x

Management

- **Cultural Practices:**
 - **Natural predators:** nematodes, sciomyzid flies, ground beetles, rove beetles, **firefly larvae**, toads, frogs, newts, thrushes, ducks, starlings, blackbirds, snakes, turtles, mice, centipedes, shrews
 - **Companion plants:** garlic, chives
 - Remove mulch to reduce slug and snail habitat
 - **Avoid consistent overhead irrigation**
 - **Monitor fields during wet and cool conditions**
 - **Look for slime trails in the morning**
 - Create barriers to prevent them from reaching the plants
 - **Shelter traps**, such as square foot shingle or cardboard segments or beer dishes, can be used to monitor for snails and slugs
 - **Increase sunlight amounts – pruning and spacing plants, removing shade, etc.**
 - Residue management
 - Soil disturbance
 - Hand pick them to remove them

Materials

- **Molluscicides:**
 - Iron phosphate
 - Stops them from eating / modifies metabolism
 - Metaldehyde
 - + Methiocarb [1A]
 - Used for a long time / some resistance
 - Dangerous to other animals
 - Acts by stopping the mollusks' ability to maintain moisture and they desiccate
 - **DRY conditions = Our FRIEND**

Current GDD: 8/26/25

North NJ: 2510 GDDs

Central NJ: 2720 GDDs

Southern NJ: 2875 GDDs

Banded Ash Clearwing Moth Borer (*Podosesia aureocincta*)

GDD Window (base 50): 306-1370

- Adults emerge in late summer (late-August to early September)
- Adults are ½" to 1" clearwing moths with a brownish-black body, translucent wings, violet-brownish forewings, and a narrow, bright orange-yellow band on the fourth abdominal segment
- Larvae are pale yellow and bore into ash trees, creating galleries and tunnels
- Larvae overwinter in the tree and resume feeding in the spring, pupating near the end of the burrows
- One generation per year
- Causes upper crown thinning
 - “staghorn” type appearance of the tree canopy
 - Multiple dead branches may be seen sticking out above the leaf canopy
- **Emergence holes are oval-shaped and about ¼" in diameter, concentrated within the lower main trunk of the trees with fewer being found in the scaffold branches**
- Tunneling larvae will expel sawdust-like frass from trunk openings they maintain, which can then be found down the trunk and accumulating at the bottom of the tree
- Pupal skins may be seen extruding from the trunk
- Damage can take years or decades to kill a tree
- **Host plants:** Ash (specifically green ash and white ash)



Photo via James Solomon, USDA Forest Service

Current GDD: 8/26/25
North NJ: 2510 GDDs
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Photo credits Steve Rettke, Rutgers RCE unless otherwise noted

Banded Ash Clearwing Moth Borer (*Podosesia aureocincta*)



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Banded Ash Clearwing Moth Borer (*Podosesia aureocincta*)



GDD Window (base 50): 306-1370

Management

• Cultural Practices:

- **Natural predators:** entomopathogenic nematodes, parasitoids, woodpeckers
- Reduce plant stress
- Prune out infested limbs
- Minimize bark damage
- Apply tree wraps carefully to avoid trapping moisture
- Kaolin clay and cedar chips can deter moths from laying eggs
- **Use pheromone traps to monitor for males**

Materials

○ Contact insecticides:

- **Pyrethroids [3]: -thrin**

○ Systemic insecticides:

- Neonicotinoids [4A]: Dinotefuran (immediately prior to egg hatch)
- Avermectins [6]: Emamectin benzoate

○ Considerations:

- Can harm non-target species

• Biorationals:

- Biorationals:
- Azadirachtin [UN]
- Spinosyns [5]: spinosad

Current GDD: 8/26/25

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Verticillium Wilt (*Verticillium* spp.)

- *Verticillium albo-atrum* or *Verticillium dahlia*
- **Soil-borne fungal pathogen** that can remain in the soil for up to seven years once infested (i.e. **persistent**)
- Can overwinter as microsclerotia in the soil
- Prefers cooler weather and drier soil
- Can be more severe in neutral to alkaline soils
- **Can be harbored by MANY weeds**
- Symptoms vary between hosts
- Symptoms may occur on branches scattered over the entire tree, or may be confined to one side
- **Often first observed during periods of drought stress during summer/early spring due to fall/winter drought**
- Can cause sudden wilting and yellowing of leaves, leaf scorch, leaf browning, and early death and dropping of leaves
- **Can cause branches to fail to leaf out in the spring, or sparse or undersized leaves**
- Can cause death to part or all of a plant (**can't sell**)
- Results in discoloration of xylem, as xylem gets clogged up and is unable to transport water
- Green, brown, or black streaks may be present when bark is peeled away from the impacted branches
- Visual symptoms alone are insufficient for diagnosis – **submit samples to diagnostic lab to verify**



Photo via UMass Coop Ext

Host plants: over 400 species

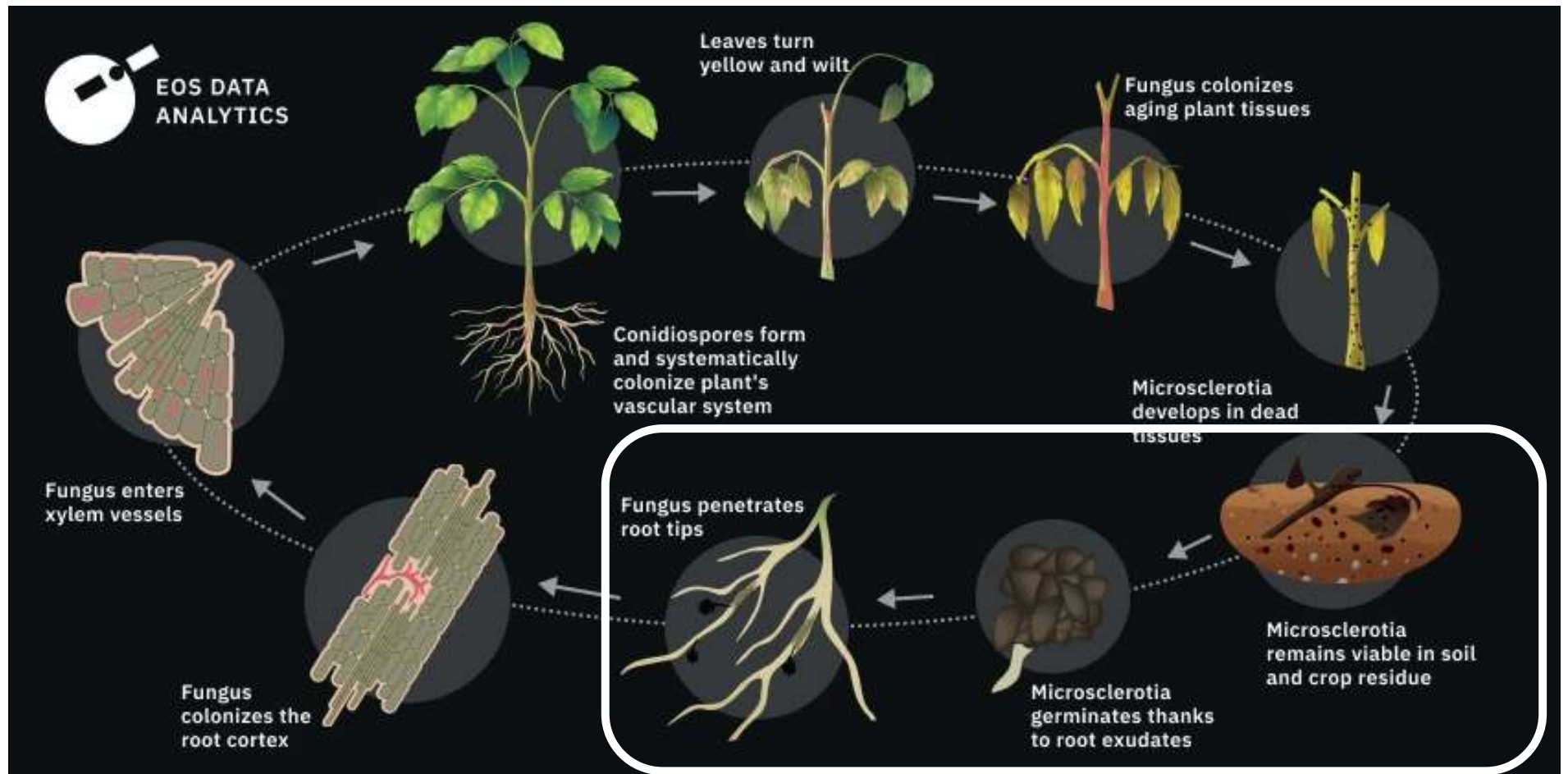
Commonly: Maple, Redbud,
Ash, Cherry, Smokebush

Verticillium Wilt (*Verticillium* spp.)



Branch dieback and death in vine maple (left), black maple (center) and Norway maple (right) caused by Verticillium wilt. Photos courtesy of Jerry E. Weiland (USDA-ARS).

Verticillium Wilt (*Verticillium* spp.)



Verticillium Wilt (*Verticillium* spp.)



Management

- **No highly effective treatments - prevention is key**
- **Get appropriate diagnosis – ID is critical**
- Crop rotation to less susceptible varieties in known infested locations
- Do not over fertilize (*stress*) and keep irrigation on 'drier side'
- Rouge symptomatic plants to reduce the spread of the disease.
- Symptomatic branches:
 - **Nursery/greenhouse: indicative of longer-term root / vascular tissue infections = rouge plants out**
 - Landscape: Prune and destroy symptomatic branches, making sure to sanitize pruners between cuts
 - Can apply high N-fertilizer to promote plant growth but just prolonging the inevitable
- Soil treatments:
 - Fumigation /solarization can reduce the pathogen in the soil
 - Removal of soil / evaluation of media
- **Sanitation of infested production equipment:** avoid spread it & avoid putting tree back into infested socket-pots

Verticillium Wilt (*Verticillium* spp.)



Sanitation is critical in
prior infested areas

<https://nursery-crop-extension.ca.uky.edu/sites/nursery-crop-extension.ca.uky.edu/files/general/potinpot.pdf>

Verticillium Wilt (*Verticillium* spp.)

Verticillium wilt



Vascular Streak Dieback (VSD) (totally different pathogen)



Plant Diagnostic Laboratory Menu

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[Soil Testing Lab](#)

Are visually very similar – need diagnostics!

1. Vascular discoloration of smokebush caused by Verticillium wilt. Note how the discoloration appears as a circular or semicircular pattern in cross section. Jerry Weiland (USDA-ARS)
2. Streaking may be observed within the xylem of infected branches. Prabha Liyanapathirana and Fulya Baysal-Gurel

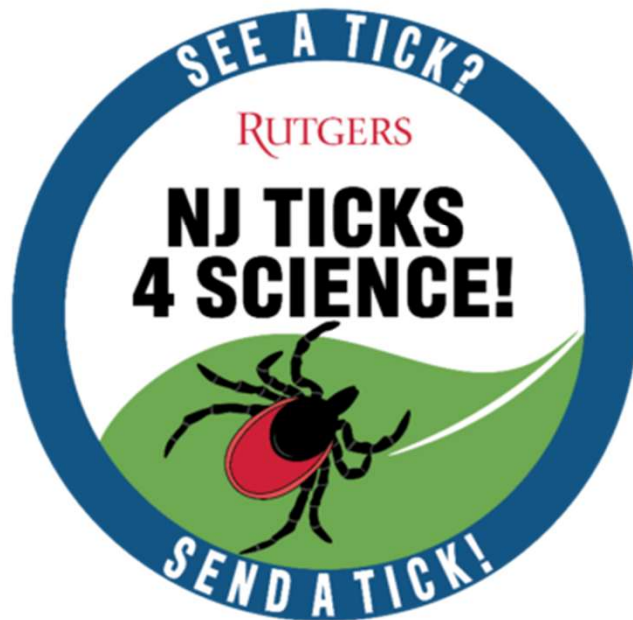
Thank you for attending



Presentation will be available on our website.

Next session: September 9th, 2025

Next time: Emily Fontaine



PLEASE SHARE WHAT
YOU SEE WITH US!

**ALWAYS OPEN TO NEW
TOPICS AND IDEAS**

Funding provided by:



National Institute of Food and Agriculture
U.S. DEPARTMENT OF AGRICULTURE

Implementation of IPM in New Jersey
-Ornamental Crops 2025

Use the Rutgers Plant Diagnostic Lab

Enables us to learn more about specific issues

Mechanical
damage

Abiotic /
Environmental

Physiological /
nutritional /

Arthropod
pest

Disease



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