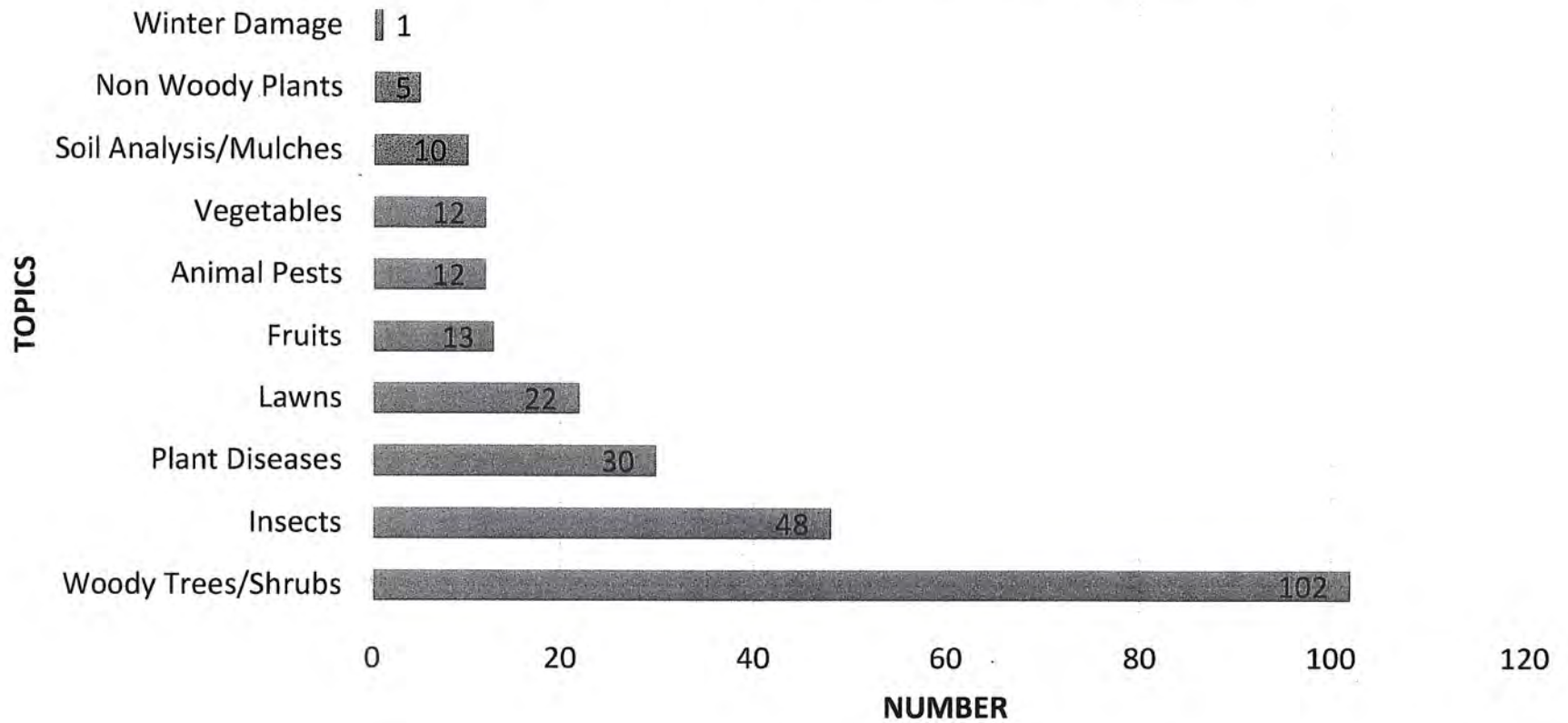


MASTER GARDENER HOTLINE CALLS 2021





Magnolia Scale

Phil Pellitteri, UW Insect Diagnostic Lab,
UW-Extension

Revised: 8/6/2012

Item number: XHT1154

Magnolia scale has become an increasingly common problem on magnolia trees in Wisconsin. Popular magnolia species such as star magnolia (*Magnolia stellata*) and saucer magnolia (*Magnolia x soulangiana*) are very susceptible to this insect.



Magnolia scale in early August.

Appearance: Adult magnolia scale

females are shiny brown, elliptical and convex in shape, and up to 1/2 inch in diameter. They can be mistaken for plant buds on the twigs. When alive, females are soft and leave a reddish stain when crushed. Immature magnolia scales are called nymphs and an early mobile nymph stage is called the crawler stage. Crawlers are yellow to reddish-brown in color and have an elliptical shape, but tend to be more flattened than adults. As nymphs mature, they secrete a white mealy wax on the outside of their bodies. This wax tends to disappear by late August.

Symptoms and Effects: Magnolia scale is a soft insect that sucks plant sap, and excretes large amounts of drippy, sticky honeydew. Honeydew provides an excellent growth medium for sooty mold fungi, and these fungi can give affected leaves and branches a black, sooty appearance. In addition, honeydew and sooty mold can stain lawn furniture and other items in the vicinity of an infested tree, and sugars in honeydew can attract wasps and ants. Magnolia scale can also cause slow growth and, on trees that are heavily infested, substantial weakening of branches, branch dieback, and eventual tree death

Life Cycle: Magnolia scale has one generation per year and overwinters as nymphs on one and two year old branches. Nymphs mature in early June, when adult females begin to lay eggs that hatch in late August.

Control: Control of magnolia scale can be challenging. Only young, mobile crawlers are easily controlled. If you decide to use spray treatments for control, select a product that contains bifenthrin, carbaryl, cyfluthrin, horticultural oil, insecticidal soap, malathion, or permethrin. Proper timing of the application of these products is critical. Apply spray treatments in late August or early September and follow with a second treatment 10 to 14 days later. Systemic insecticides, such as those containing imidacloprid, have also been effective in magnolia scale control, but such products must be drenched into the root zone in early May. Finally, dormant oils can be used for control, but must be applied in March, before buds open. Be sure to read and follow all label instructions of the insecticide that you select to ensure that you use the insecticide in the safest and most effective manner possible.

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Landscape and Ornamental

Department of Entomology

BAGWORMS

Clifford S. Sadof, Extension Entomologist

During July and August, bagworms may defoliate arborvitae, junipers and other trees and shrubs. Bagworms are caterpillars that live inside spindle-shaped bags which they construct to protect themselves against birds and other enemies. These bags, composed of silken threads and bits of foliage, look so much like a part of the tree that they may go unnoticed until extensive damage has occurred. Bagworms are common throughout the state.

LIFE HISTORY

Early in June, the insects hatch from eggs which wintered in the old bags attached to tree branches. As soon as the young worms appear, they start to spin bags and continue to enlarge these as they feed and grow. The caterpillars crawl part way out of the bags to feed. If disturbed, they retreat safely inside, and it is almost impossible to pull them out. Each female bag can produce over 1,000 bagworms.

Bagworms mature in late August or early September. At this time the bags are about 2 inches long and can no longer be killed by pesticides. The worms then attach the bags firmly to branches or other objects and change into the adult stage. The wingless female never leaves the bag and is fertilized by the winged male. The eggs are laid in the bag where they pass the winter. Eggs of bagworms located south of Monticello, Peru and Bluffton, or near Lake Michigan usually survive the winter. In other parts of the State, eggs can be killed during cold winters. There is only one generation each year.



Bagworm caterpillar feeding.

CONTROL MEASURES

Bagworms tend to be a problem on trees that are isolated or in urban settings. When bags are found in the tree, simply pick the bagworms off and drown them in a bucket of soapy water. This method is most effective before eggs hatch out of the bags in June.

Bagworms can be controlled by spraying the foliage with insecticides after eggs have hatched and small bags are seen on the trees. Caterpillars must consume the foliage for the insecticide to kill them. For best results, use a biorational pesticide listed in Table 1. The biorational materials will kill



Bagworm hanging from branch.



Young bagworm covering itself with leaves.

the caterpillars without killing the natural enemies of spider mites and scale insects that can cause additional damage to the plant. (See E-42-W Spider Mites on Ornamentals and E-29-W Scale Insects on Shade Trees and Shrubs). Caterpillars may have to feed on treated leaves for 1-2 days to get a lethal dose of these materials. In contrast, rescue materials can kill caterpillars feeding on the foliage within hours after application. All pesticides are most effective when directed against worms in bags that are still small. Dipel is only ef-

fective on bags < 1" long. Two weeks after any pesticide application look for live bagworms to determine if additional treatment is needed.

Alternatively, a soil application of dinotefuran may be applied to the base of the tree. Applications should be made in early May to allow enough time for this material to get into the foliage before eggs hatch. Our research has shown this product to be most effective on young bagworms on small trees.

Table 1. Pesticide List

Insecticide	Formulation	Amount per 100 gallons	Amount per gallon	Suggested Use	General Use Restriction (Check label) H=Homeowner C=Commercial
Acephate (Orthene)	75% S 15.6% EC	1/3 lb. 1 1/5 cup	1/3 tsp. 1 1/2 Tbsp.	Rescue	H, C
Acetamiprid (TriStar)	30 SG	2.7-5.3 oz.	-	Rescue	H, C
Azadirachtin (Azatrol, Azatin-o and others)	1.2% SEC	96-160 fl. oz.	1-1.6 fl. oz.	Biorational	H, C
<i>Bacillus thuringiensis</i> (Kurstaki) (Dipel, Biotrol, others)	See label	See label	See label	Biorational	H, C
Beta-Cyflurin (Tempo)	20 WP 0.75 EC	1.9 oz. -	- 1 Tbsp.	Rescue	C H (Bayer)
Bifenthrin (Talstar L&T and other site specific products)	0.7 F	5.5 - 10.9 oz.	1/3 - 2/3 tsp.	Rescue	H, C
Carbaryl (Sevin and others)	4 F 2 F	1 qt. 2 qt.	2 tsp. 4 tsp.	Rescue	H, C
Chlorantraniliprol (Acelepryn)	1.67 SC	1-2 fl. oz.	-	Biorational	C
Cyfluthrin (Decathlon) (Bayer Lawn & Garden)	20 WP 0.75 EC	1.9 oz. -	- 1 Tbsp.	Rescue	C H (Bayer)
Deltamethrin (Deltagard T&O) (Suspend SC)	4.75% EC	4 - 8 oz.	1/4 - 1/2 tsp.	Rescue	H, C
Dinotefuran (Safari)	20 G	See label	See label	Rescue	C
Fluvalinate (Mavrik)	2 F	5 - 10 oz.	1/4 - 1/2 tsp.	Rescue	H, C
Indoxacarb (Provaunt)	2.4 SC	1.2-2.5 fl. oz.	-	Biorational	C
Lambda-cyhalothrin (Scimitar, Demand)	9.7% EC	1.5 - 5 oz.	-	Rescue	H, C
Malathion	57% EC	2 - 4 pt.	2 tsp.	Rescue	H, C
Permethrin (Astro EC) (Spectracide Bug Stop) (Eight)	36.8% EC 2.5% EC	4 - 8 oz. -	1/4 - 1/2 tsp. 2 Tbsp.	Rescue Rescue	C H
Spinosad (Conserve) Bulls-Eye Bioinsecticide Fertilome Borer, Bagworm, Leafminer & Tent Caterpillar Spray	SC SC	6 oz. -	1/2 tsp. 4 Tbsp. 4 Tbsp.	Biorational	C H H
Tebufenozide (Confirm)	25% EC	4 - 8 oz.	1/4 - 1/2 Tsp.	Biorational	C

READ AND FOLLOW ALL LABEL INSTRUCTIONS. THIS INCLUDES DIRECTIONS FOR USE, PRECAUTIONARY STATEMENTS (HAZARDS TO HUMANS, DOMESTIC ANIMALS, AND ENDANGERED SPECIES), ENVIRONMENTAL HAZARDS, RATES OF APPLICATION, NUMBER OF APPLICATIONS, REENTRY INTERVALS, HARVEST RESTRICTIONS, STORAGE AND DISPOSAL, AND ANY SPECIFIC WARNINGS AND/OR PRECAUTIONS FOR SAFE HANDLING OF THE PESTICIDE.

July 2020

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Viburnum Leaf Beetle

Pest Alert

Authors: PJ Liesch, UW Insect Diagnostic Lab

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The viburnum leaf beetle (VLB), *Pyrrhalta viburni*, is an invasive insect that feeds exclusively on and can significantly damage *Viburnum* species. VLB is native to Europe and was detected in Canada in 1947. The first report of VLB in the United States was in New York State in 1996. VLB is now found scattered across much of the northeastern US. In Wisconsin, an isolated infestation of VLB was discovered in Dane County in 2009, but was successfully eradicated. In 2014, VLB was detected on a mature viburnum bush in northern Milwaukee County and other nearby infestations were detected in June 2015. As of early 2021, VLB infestations have been found in 12 Wisconsin counties, including Brown, Dane, Iron, Kenosha, Milwaukee, Ozaukee, Racine, Sheboygan, Walworth, Washington, Waukesha, and Winnebago Counties.



Viburnum leaf beetles adults (left) and larvae (right). (Photos courtesy of Paul Weston, Cornell University, Bugwood.org)

Appearance: Adult VLB's are approximately $\frac{1}{4}$ inch long and yellowish-brown in color. VLB larvae can be up to $\frac{1}{3}$ inch long and range in color from yellowish-green to light brown with a series of black spots and dashes on their bodies.

Symptoms and Effects: VLB larvae chew holes in viburnum leaves in the spring creating a lace-like (i.e., skeletonized) pattern. VLB larvae feed individually or in small groups and can cause significant damage to viburnum shrubs. This damage can resemble the feeding damage of Japanese beetles (see University of Wisconsin Garden Facts XHT1062 "Japanese Beetle"). In late June and early July, VLB adults begin to feed, chewing oblong holes in leaves. Severe VLB infestations can cause complete defoliation of a viburnum shrub, which weakens the plant over time and can eventually lead to death.

Life Cycle: There is only one generation of VLB per year. VLB's overwinter as eggs and development from eggs to adults takes approximately eight weeks. Larvae typically appear in early to mid-May and feed for several weeks, passing through three stages (instars) as they grow. In early to mid-June, larvae pupate in the soil and adults emerge by late June or early July. VLB females lay eggs during the summer and into October. They chew small pits in twigs, deposit five to eight eggs into each pit, and then cover the pits with tiny pieces of chewed wood to protect the eggs. Each female can deposit up to 500 eggs. Eggs remain in place through the winter until they hatch the following spring.

Control:

Cultural: When selecting viburnum plants for the landscape, DO NOT use arrowwood viburnum (*Viburnum dentatum*), European cranberrybush viburnum (*Viburnum opulus*), or American cranberrybush viburnum (*Viburnum opulus* var. *americanum*) as these types of viburnums are strongly preferred by VLB. Instead use resistant viburnums such as doublefile viburnum (*Viburnum plicatum* f. *tomentosum*), Judd viburnum (*Viburnum x juddii*), or Koreanspice viburnum (*Viburnum carlesii*). In addition, between October and the following spring, examine viburnums for twigs where VLB's have laid their eggs. Prune and destroy these twigs to reduce VLB numbers. During the growing season encourage natural VLB predators in your area (e.g., lady beetles, spined soldier bugs, assassin bugs, green lacewings) that can reduce VLB numbers.



Adult viburnum leaf beetle feeding damage (left) and egg-laying sites (right). (Photos courtesy of Paul Weston, Cornell University, and Bruce Watt, University of Maine; Bugwood.org)

Chemical: Prior to bud break, apply horticultural oil to twigs where VLB eggs have been laid. This will significantly reduce the number of eggs that will hatch. Control any surviving larvae with contact insecticides such as acephate, bifenthrin, carbaryl, cyfluthrin, deltamethrin, lambda-cyhalothrin, and permethrin. Horticultural oil, insecticidal soap, pyrethrins and spinosad can also be effective. To achieve the best results, apply insecticides when larvae are small and before they have caused significant damage. VLB adults can be managed with contact insecticides, if needed, but are mobile and more challenging to control. Systemic products (e.g., clothianidin and imidacloprid) applied as soil drenches can also be effective, but apply these products after flowering (to minimize any risks to pollinators), but before VLB damage occurs to achieve the best protection.

For more information on viburnum leaf beetle: For more information on viburnum leaf beetle: [Contact your county Extension Educator.](#)

Pest Alert

Animal and Plant Health Inspection Service
Plant Protection and Quarantine

Spotted Lanternfly (*Lycorma delicatula*)

The spotted lanternfly is an invasive pest, primarily known to feed on tree of heaven (*Ailanthus altissima*) but has many other host plants, including grape, hop, apple, stone fruit, maple, poplar, walnut, and willow. The insect changes hosts as it goes through its developmental stages. Nymphs feed on a wide range of plant species, while adults prefer to feed and lay eggs on tree of heaven (*A. altissima*). Spotted lanternflies are invasive and can spread rapidly when introduced to new areas. While the insect can walk, jump, or fly short distances, its long-distance spread is facilitated by people who move infested material or items containing egg masses. If allowed to spread in the United States, this pest could damage the country's grape, orchard, and logging industries.

Distribution

The spotted lanternfly is present in China, Japan, South Korea, Taiwan, and Vietnam. In 2014, the insect was first detected in the United States in Pennsylvania. Since then, spotted lanternfly infestations have been detected in Delaware, Maryland, New Jersey, and Virginia.

Damage

Both nymphs and adults of spotted lanternfly cause damage when they feed, sucking sap from stems and branches. This can reduce photosynthesis, weaken the plant, and eventually contribute to the plant's death. In addition, feeding can cause the plant to ooze or weep, resulting in a fermented odor, and the insects themselves excrete large amounts of fluid (honeydew). These fluids promote mold growth and attract other insects.



Adult spotted lanternfly

Description

Adult spotted lanternflies are about 1 inch long and one-half inch wide, and they have large and visually striking wings. Their forewings are light brown with black spots at the front and a speckled band at the rear. Their hind wings are scarlet with black spots at the front and white and black bars at the rear. Their abdomen is yellow with black bars. Nymphs in their early stages of development appear black with white spots and turn to a red phase before becoming adults. Egg masses are yellowish-brown in color, and most are covered with a gray, waxy coating prior to hatching.

Life Cycle

The spotted lanternfly lays its eggs on smooth host plant surfaces and on non-host material, such as bricks, stones, and dead plants. Eggs hatch in the spring and early summer, and nymphs begin feeding on a wide range of host plants by sucking sap from young stems and branches. Adults appear in late July and tend to focus their feeding on tree of heaven (*A. altissima*) and grapevine (*Vitis vinifera*). As the adults feed, they excrete sticky, sugar-rich fluid (honeydew). The fluid can build up on plants and on the ground underneath infested plants, causing sooty mold to form.

Where To Look

Spotted lanternfly adults and nymphs frequently gather in large numbers on host plants. They are easiest to spot at dusk or at night as they migrate up and down the trunk of the plant. During the day, they tend to cluster near the base of the plant if there is adequate cover or in the canopy, making them more difficult to see. Egg masses can be found on smooth surfaces on the trunks of host plants and on other smooth surfaces, including brick, stone, and dead plants.

Report Your Findings

If you find an insect that you suspect is the spotted lanternfly, please contact your local Extension office or State Plant Regulatory Official to have the specimen identified properly.

To locate an Extension specialist near you, go to the U.S. Department of Agriculture (USDA) website at nifa.usda.gov/Extension. A directory of State Plant Regulatory Officials is available on the National Plant Board website at www.nationalplantboard.org/membership.



Spotted lanternfly nymphs are black with white spots in early stages of development and turn red before becoming adults.



Covered and uncovered egg masses



Cluster of adults on the trunk of a tree at night

Living with Wildlife

Living with Wildlife

[Introduction & Species \(/dnr/fish-and-wildlife/wildlife-resources/living-with-wildlife\)](#) | [Interacting with Wildlife \(/dnr/fish-and-wildlife/wildlife-resources/living-with-wildlife/interactions\)](#) | [Common Questions \(/dnr/fish-and-wildlife/wildlife-resources/living-with-wildlife/common-questions\)](#)

The Department of Natural Resources does not provide services for problem wildlife. If necessary, you can reach out to a qualified [Wildlife \(/dnr/fish-and-wildlife/wildlife-resources/living-with-wildlife/nuisance-wildlife-control-operators\)](#) or [Waterfowl Control Operator \(/dnr/fish-and-wildlife/files/fw-NuisanceWaterfowlControlOperators.pdf\)](#) to deal with problem wildlife (such as causing damage or posing a threat to people or domestic animals). Operators name their own rates and fees.

For more information, contact the Division of Fish & Wildlife at 317-232-4200 or dfw@dnr.IN.gov (<mailto:fw-NuisanceWaterfowlControlOperators.pdf>). If you need a wild animal control permit, please contact the DNR Permit Coordinator at 317-232-4102 or [apply for a permit application \(/dnr/fish-and-wildlife/licenses-and-permits\)](#).

Domesticated animals are not regulated by the Indiana Department of Natural Resources.

Species-Specific Information

Small Mammal Removal

A resident landowner or tenant can legally capture the following species of wild animals without a permit on the property that he/she owns or rents if the animal is causing or threatening to cause damage to property or is posing a health or safety threat to people or domestic animals.

- Beaver
- Gray Fox
- Red Fox
- Opossum
- Mink
- Muskrat



- Raccoon
- Skunk
- Fox Squirrel
- Gray Squirrel
- Long-tailed Weasel

The landowner/tenant also can designate another person to take that animal for them if:

1. The landowner/tenant provides written permission (which must be on the person while taking the animal),
2. AND no compensation of any kind is given to the person who takes the animal.
3. A hunting or trapping license or nuisance wild animal control permit is required to take wild animals on land that you do not own or rent.

Within 24 hours of capture, the person who takes the animal must release it or euthanize it. Animals that are released must be released on land in the county where it was captured. Furthermore, the landowner or property manager must give permission for the release. These nuisance animals cannot be possessed for more than 24 hours and cannot be sold, traded, bartered, or gifted.

Rabbit Removal

If you want to trap or shoot rabbits, you will need a nuisance wild animal control permit from the DNR, or you will need to take them during the rabbit season and use only those methods legal during the open rabbit season (firearms can only be used where legal). Cage traps (wire or wood) that are baited with dried apples or dry ear corn can be effective in capturing cottontail rabbits.

Coyote Removal

Landowners may take coyotes year-round on their private property by trapping or shooting without possessing a wild animal control permit from the DNR and without having a hunting or trapping license. Additionally, a landowner does not need to possess a wild animal control permit from DNR to give another individual written permission to shoot or trap coyotes on the landowner's property. However, any person taking coyotes on someone else's property must have a valid hunting or trapping license and, if the take happens outside the regulated coyote season, have written permission from the landowner. Please note that any firearm, archery, or air rifle equipment used for coyote removal may be used only in accordance with local ordinances.



Individuals may also get help with coyote conflicts by contracting with a [wildlife control operator](https://www.in.gov/dnr/fish-and-wildlife/wildlife-resources/living-with-wildlife/nuisance-wildlife-control-operators). (<https://www.in.gov/dnr/fish-and-wildlife/wildlife-resources/living-with-wildlife/nuisance-wildlife-control-operators>)

Other Small Mammal Removal

The species listed below can be captured or killed year-round without a permit or hunting or trapping license from the DNR, and there are no limits to the number of these species that can be taken.

- Chipmunks
- Groundhogs
- Mice
- Moles
- Common (Norway) Rats
- Shrews
- Voles

Birds

The following species of birds can be taken without a permit if the birds are committing or about to commit depredations upon ornamental or shade trees, agricultural crops, livestock or wildlife, or are concentrated in numbers and in a manner that constitutes a health hazard or nuisance as provided under 50 CFR 16 (federal law). Be sure to check local ordinances prior to using pyrotechnics or firearms.

- Brewer's Blackbirds
- Red-winged Blackbirds
- Brown-headed Cowbirds
- Crows
- Common Grackles

The following can be taken without a permit at any time. Be sure to check local ordinances prior to using pyrotechnics or firearms.

- Monk parakeets
- Rock (feral) pigeons (not including homing pigeons)
- House sparrows
- European starlings

Mute Swans

A resident landowner or tenant can legally capture a mute swan on the property that he/she owns or rents if the animal is causing or threatening to cause damage to property, or posing a health or safety threat to people or domestic animals.* Within 24 hours of capture, the person who takes the animal must release it or euthanize it. These animals cannot be possessed for more than 24 hours and cannot be sold, traded, bartered, or gifted.

- [District Wildlife Biologists \(/dnr/fish-and-wildlife/wildlife-resources/wildlife-biologists\)](/dnr/fish-and-wildlife/wildlife-resources/wildlife-biologists)
- [Hunting and Trapping Information \(/dnr/fish-and-wildlife/hunting-and-trapping\)](/dnr/fish-and-wildlife/hunting-and-trapping)
- [Orphaned & Injured Wildlife \(/dnr/fish-and-wildlife/wildlife-resources/orphaned-and-injured-animals\)](/dnr/fish-and-wildlife/wildlife-resources/orphaned-and-injured-animals)
- [Permit Information \(/dnr/fish-and-wildlife/licenses-and-permits/permits-commercial-licenses\)](/dnr/fish-and-wildlife/licenses-and-permits/permits-commercial-licenses)
- [Permitted Wildlife Rehabilitators \(/dnr/fish-and-wildlife/wildlife-resources/orphaned-and-injured-animals/wildlife-rehabilitators\)](/dnr/fish-and-wildlife/wildlife-resources/orphaned-and-injured-animals/wildlife-rehabilitators)
- [Urban Deer Technical Guide \(/dnr/fish-and-wildlife/files/fw-UrbanDeerTechnicalGuide.pdf\)](/dnr/fish-and-wildlife/files/fw-UrbanDeerTechnicalGuide.pdf)
- [Waterfowl Control Operators \(/dnr/fish-and-wildlife/files/fw-NuisanceWaterfowlControlOperators.pdf\)](/dnr/fish-and-wildlife/files/fw-NuisanceWaterfowlControlOperators.pdf)
- [Wildlife Control Operators \(/dnr/fish-and-wildlife/wildlife-resources/living-with-wildlife/nuisance-wildlife-control-operators\)](/dnr/fish-and-wildlife/wildlife-resources/living-with-wildlife/nuisance-wildlife-control-operators)

Online Services

- [Buy a hunting or fishing license \(http://www.in.gov/ai/appfiles/dnr-license/index.html\)](http://www.in.gov/ai/appfiles/dnr-license/index.html)
- [Buy a license gift certificate \(https://secure.in.gov/apps/dnr/htf/license/gift\)](https://secure.in.gov/apps/dnr/htf/license/gift)
- [Check game online \(/dnr/fish-and-wildlife/hunting-and-trapping/indiana-checkin-game\)](/dnr/fish-and-wildlife/hunting-and-trapping/indiana-checkin-game)
- [Find your customer ID \(https://secure.in.gov/apps/dnr/gamecheck/cid-lookup.html\)](https://secure.in.gov/apps/dnr/gamecheck/cid-lookup.html)
- [Obtain a Migratory Bird Harvest Information Program Number \(/dnr/fish-and-wildlife/hunting-and-trapping/waterfowl-and-migratory-game-birds/migratory-bird-harvest-information-program-hip\)](/dnr/fish-and-wildlife/hunting-and-trapping/waterfowl-and-migratory-game-birds/migratory-bird-harvest-information-program-hip)
- [Register for a reserved hunt \(http://www.in.gov/ai/appfiles/dnr-slh/landing_page.html\)](http://www.in.gov/ai/appfiles/dnr-slh/landing_page.html)
- [Reprint your license \(https://secure.in.gov/apps/dnr/htf/license/reprint\)](https://secure.in.gov/apps/dnr/htf/license/reprint)
- [More IN.gov Online Services \(http://www.in.gov/services.htm\)](http://www.in.gov/services.htm)
- [IN.gov Subscriber Center \(http://www.in.gov/subscriber_center.htm\)](http://www.in.gov/subscriber_center.htm)

I Want To

- [Donate to the Indiana Nongame Wildlife Fund \(/dnr/fish-and-wildlife/nongame-and-endangered-wildlife/donate-to-the-indiana-nongame-wildlife-fund\)](/dnr/fish-and-wildlife/nongame-and-endangered-wildlife/donate-to-the-indiana-nongame-wildlife-fund)
- [Find out where to recreate \(/dnr/places-to-go/indiana-dnr-locations\)](/dnr/places-to-go/indiana-dnr-locations)
- [Get help for an orphaned/injured animal \(/dnr/fish-and-wildlife/wildlife-resources/orphaned-and-injured-animals\)](/dnr/fish-and-wildlife/wildlife-resources/orphaned-and-injured-animals)
- [Get help with a nuisance animal \(/dnr/fish-and-wildlife/wildlife-resources/living-with-wildlife\)](/dnr/fish-and-wildlife/wildlife-resources/living-with-wildlife)
- [Receive email updates \(https://public.govdelivery.com/accounts/INDFISHWILD/subscriber/topics?also=CODE_RED\)](https://public.govdelivery.com/accounts/INDFISHWILD/subscriber/topics?also=CODE_RED)

*In circumstances where mute swans are residents of a community or a lake association, a wild animal control permit will need to be obtained.

More information

Mammals

- [Beaver \(/dnr/fish-and-wildlife/wildlife-resources/animals/beaver\)](/dnr/fish-and-wildlife/wildlife-resources/animals/beaver)
- [Bobcat \(/dnr/fish-and-wildlife/wildlife-resources/animals/bobcats\)](/dnr/fish-and-wildlife/wildlife-resources/animals/bobcats)
- [Chipmunk \(/dnr/fish-and-wildlife/wildlife-resources/living-with-wildlife/eastern-chipmunk\)](/dnr/fish-and-wildlife/wildlife-resources/living-with-wildlife/eastern-chipmunk)
- [Cottontail Rabbit \(/dnr/fish-and-wildlife/wildlife-resources/animals/cottontail-rabbit\)](/dnr/fish-and-wildlife/wildlife-resources/animals/cottontail-rabbit)
- [Coyote \(/dnr/fish-and-wildlife/wildlife-resources/living-with-wildlife/coyotes\)](/dnr/fish-and-wildlife/wildlife-resources/living-with-wildlife/coyotes)
- [Eastern Mole \(/dnr/fish-and-wildlife/wildlife-resources/living-with-wildlife/eastern-mole\)](/dnr/fish-and-wildlife/wildlife-resources/living-with-wildlife/eastern-mole)
- [Feral / Wild Hog \(/dnr/fish-and-wildlife/wildlife-resources/animals/feral-wild-hog\)](/dnr/fish-and-wildlife/wildlife-resources/animals/feral-wild-hog)
- [Fox Squirrel \(/dnr/fish-and-wildlife/wildlife-resources/animals/fox-squirrel\)](/dnr/fish-and-wildlife/wildlife-resources/animals/fox-squirrel)
- [Gray Squirrel \(/dnr/fish-and-wildlife/wildlife-resources/living-with-wildlife/gray-squirrel\)](/dnr/fish-and-wildlife/wildlife-resources/living-with-wildlife/gray-squirrel)
- [Groundhog \(Woodchuck\) \(/dnr/fish-and-wildlife/wildlife-resources/living-with-wildlife/groundhog\)](/dnr/fish-and-wildlife/wildlife-resources/living-with-wildlife/groundhog)
- [Muskrat \(/dnr/fish-and-wildlife/wildlife-resources/animals/muskrat\)](/dnr/fish-and-wildlife/wildlife-resources/animals/muskrat)
- [Raccoon \(/dnr/fish-and-wildlife/wildlife-resources/animals/raccoon\)](/dnr/fish-and-wildlife/wildlife-resources/animals/raccoon)
- [Red Fox \(/dnr/fish-and-wildlife/wildlife-resources/animals/red-fox\)](/dnr/fish-and-wildlife/wildlife-resources/animals/red-fox)
- [River Otter \(/dnr/fish-and-wildlife/wildlife-resources/animals/river-otter\)](/dnr/fish-and-wildlife/wildlife-resources/animals/river-otter)
- [Striped Skunk \(/dnr/fish-and-wildlife/wildlife-resources/animals/striped-skunk\)](/dnr/fish-and-wildlife/wildlife-resources/animals/striped-skunk)
- [Opossum \(/dnr/fish-and-wildlife/wildlife-resources/animals/possum\)](/dnr/fish-and-wildlife/wildlife-resources/animals/possum)
- [White-tailed Deer \(/dnr/fish-and-wildlife/wildlife-resources/animals/white-tailed-deer-biology\)](/dnr/fish-and-wildlife/wildlife-resources/animals/white-tailed-deer-biology)

Birds

- [American Crow \(/dnr/fish-and-wildlife/wildlife-resources/living-with-wildlife/american-crow\)](/dnr/fish-and-wildlife/wildlife-resources/living-with-wildlife/american-crow)
- [Canada Geese \(/dnr/fish-and-wildlife/hunting-and-trapping/canada-geese-management/behavior-and-biology\)](/dnr/fish-and-wildlife/hunting-and-trapping/canada-geese-management/behavior-and-biology)
- [Hawks \(/dnr/fish-and-wildlife/wildlife-resources/living-with-wildlife/hawks\)](/dnr/fish-and-wildlife/wildlife-resources/living-with-wildlife/hawks)

Reptiles

- [Snakes \(/dnr/fish-and-wildlife/wildlife-resources/animals/snakes\)](/dnr/fish-and-wildlife/wildlife-resources/animals/snakes)

Helpful links

- [Canada Goose Egg and Nest Destruction Permit \(https://epermits.fws.gov/eRCGR/geSI.aspx\)](https://epermits.fws.gov/eRCGR/geSI.aspx)
- [Canada Goose Management \(/dnr/fish-and-wildlife/hunting-and-trapping/canada-geese-management\)](/dnr/fish-and-wildlife/hunting-and-trapping/canada-geese-management)
- [Deer Management \(/dnr/fish-and-wildlife/wildlife-resources/animals/white-tailed-deer/managing-deer-damage\)](/dnr/fish-and-wildlife/wildlife-resources/animals/white-tailed-deer/managing-deer-damage)

- Report a dead or sick animal (<https://on.in.gov/sickwildlife>)
- Report a poacher (</dnr/law-enforcement/turn-in-a-poacher-or-polluter>)

7 Simple Steps to a Better Home Lawn

Maintaining the most attractive home lawn in the neighborhood takes time and effort. However, if your goal is an attractive looking, healthy lawn with a minimal amount of effort, it can be accomplished using some simple steps. The following is a brief description of those steps in order of importance, with emphasis on minimizing the amount of time and inputs dedicated to your lawn. For more details on these steps, check our turf website (www.agry.purdue.edu/turf or www.turf.uiuc.edu)

1. Mow at 3.0 inches

All cool-season lawn grasses such as Kentucky bluegrass, perennial ryegrass, and tall fescue in Indiana and Illinois perform best at a mowing height of 3 inches or more. Set the mowing height on your mower at 3 inches or the highest setting and leave it there all year.

2. Mow frequently

Mow as often as needed to never remove more than 1/3 of the leaf blade in a single mowing. In other words, if your mower is set at 3 inches, mow when the grass reaches 4 inches. This might be twice per week in the early spring and once every 2 to 3 weeks in the summer.

3. Return the clippings

Bagging the clippings increases the time and effort needed for mowing. Leaving the clippings returns valuable nutrients and does not harm the turf. Mulching mowers are effective for returning clippings, but older side-discharge mowers will also work acceptably.

4. Fertilize in the Fall

Fertilizing primarily in the fall promotes healthy turf while not stimulating excessive leaf growth which increases the need for mowing. Fertilize a minimum of twice per year, applying 1.0 pound nitrogen per 1000 ft² in September and 1.0 to 1.25 pounds nitrogen per 1000 ft² in early November. An additional application of 1.0 pound nitrogen per 1000 ft² in mid-to-late May will keep the lawn green and healthy throughout the summer.

5. Irrigate

During most summers in the Midwest, your lawn needs watering to maintain color and density. Water only as needed when the lawn first shows signs of water stress. These include a bluish-gray color of the grass and/or depressed footprints that remain visible after walking across the lawn. Irrigation might be needed only once every 2 to 3 weeks in the early summer, but twice per week in August. Conversely, if you do not regularly irrigate your turf, apply 1/2 inch of water every 3 to 4 weeks after the lawn has gone dormant (turned brown) to prevent significant thinning of the lawn. Once rains return the lawn will slowly regain its green color.

6. Control dandelions

Dandelions are the most visible, and often considered the most unsightly, weed by homeowners. Following the first five steps will minimize problems with dandelions. If dandelion problems still persist, mid-October applications of

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Turf Science**

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Agronomy**

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Natural
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Environmental
Sciences**

www.turf.uiuc.edu

broadleaf herbicides containing 2,4-D, MCPP, and dicamba are effective. In many cases, spot spraying a herbicide directly on the occasional weed is all that is needed for minor dandelion problems. A less effective method is to apply an herbicide in the spring after dandelions have started flowering. Be sure to read, understand and follow all label instructions when using herbicides.

7. Control crabgrass

If you are practicing the first six steps of this publication, you should have little problem with crabgrass. If crabgrass is still a problem in your lawn, an application of a preemergence herbicide in the early spring is most effective. Apply by April 1 in the southern halves of Indiana and Illinois and by April 15 in the northern halves of Indiana and Illinois.

More Information

For more details on these steps, contact your local extension office or refer to the following publications (available at www.agry.purdue.edu/turf)

- AY-7 *Irrigation Practices for Home Lawns*
- AY-8 *Mowing, Thatching, Aerifying and Rolling Turf*
- AY-9 *Control of Broadleaf Weeds in Home Lawns*
- AY-10 *Control of Crabgrass in Home Lawns*
- AY-22 *Fertilizing Established Lawns*
- AY-26 *Should I Hire a Professional Lawn Care Service*
- AY-27 *Maintenance Calendar for Indiana Lawns*

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What is spruce decline and what should you do about it?

Bert Cregg, Christine McTavish, Andrew Jarosz, Jill O'Donnell, and Dennis Fulbright
Michigan State University - June 28, 2019

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Frequently asked questions about spruce decline.

What's wrong with the blue spruce trees in my neighborhood?

Colorado blue spruce trees have long been among the most popular conifers for landscaping in Michigan and the upper Midwest. Blue spruce trees are widely planted due to their good growth rate, stately form and, of course, their blue foliage. Unfortunately, blue spruce trees are subject to a wide range of insect and disease problems that can impact their growth and aesthetic appeal.

The prevalence of diseases on blue spruce trees has intensified in recent years and trees are declining rapidly in many areas (Photo 1). The key symptom of spruce decline is branch dieback, which progresses over two to four years and renders the plant's appearance unacceptable for most homeowners (Photo 2). The rapid decline of many spruce trees in Michigan and surrounding states appears to be related to an increase of canker diseases coupled with other disease and insect problems that plague the species.

What kind of diseases affect blue spruce trees?

There are three principle types of diseases that affect blue spruce trees: needlecasts, tip blights and canker diseases. All of these diseases are caused by fungal pathogens and each produce specific symptoms that can be useful in diagnosing the problem.

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Photo 1. Declining spruce trees. Photo by Bert Cregg, MSU

1. Needlecasts. As the name implies, trees with needlecast diseases shed needles. Needlecast fungi often infect needles on the current year's shoots. As the disease progresses, the needles die, usually the year following the infection. As a result, trees affected by needlecasts often have an outer "shell" of live needles on current shoots and dead needles on older shoots (Photo 3). The two most common needlecasts we find in spruce are caused by the fungal pathogens *Rhizosphaera* and *Stigmina/Mycosphaerella*.

2. Tip blights. Tip blights are fungal diseases that typically cause dieback to new, emerging shoots (Photo 4). Tip blights are most common on pines, especially Austrian pines, but can also occur on spruces.

3. Canker diseases. Canker diseases are caused by fungi that infect branches or the main stem of trees. Typical symptoms of cankers are sunken areas along the stem that may ooze resin (Photo 5). Trees may produce ridges of wound tissue around older canker infections

as the tree attempts to restrict the fungus' growth. As cankers develop, they can interfere with the branch's ability to transport water and nutrients, resulting in the death of individual branches often referred to as "flagging."



Photo 2. Decline usually starts on lower branches. Photo credit: Dennis Fulbright, MS

Photos 3-5. Left, Needlecasts kill older (inner) needles, but leave newer needles unaffected. Middle, New shoot tips killed by Phomopsis tip blight. Right, Resin oozing from a branch canker caused by Cytospora. Photo credits: Left and middle photo, Dennis Fulbright, [MSU \(Michigan State University\)](https://www.msu.edu/); right photo, Michael Kangas, NDSU, [Bugwood.org](https://www.bugwood.org/).

What kinds of insects affect blue spruce trees?

Numerous insect pests can impact spruces in Michigan's landscape, but the two most common are gall adelgids and spruce spider mites. In both cases, the insect pests are tiny and you may need a hand lens to see them. Often times, people are more likely to see the

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damage as opposed to the insect pests themselves.

1. Gall adelgids. Adelgids are small insects that feed on shoots by sucking plant sap. As they do so, they cause the shoots to deform and produce galls that resemble cones (Photo 6). Damage from gall adelgids is mainly aesthetic.

2. Spruce spider mites. Spruce spider mites cause needle discoloration and eventually kill needles, which can be mistaken for a needlecast disease (Photo 7). Technically, mites are not insects, but are related to spiders. This distinction is important since not all insecticides will control mites.



Photos 6-7. Left, Gall caused by Cooley spruce adelgid. Right, Needle damage caused by mites. Photo credits: Jill O'Donnell, [MSU \(Michigan State University\)](http://MSU.MichiganStateUniversity)

Why are we seeing increased decline in blue spruce trees?

There are a number of factors contributing to the decline we see in blue spruce trees, including environmental changes, poor site conditions and new pathogens. Colorado blue spruce is native to arid regions in the Rocky Mountains. Michigan's climate is generally more humid, especially in the summer, which is ideal for fungal pathogens to thrive. In landscapes, Colorado blue spruces have been planted on some sites that are marginal for their success. As a result, they are stressed and more susceptible to fungal pathogens.

Finally, for decades the default diagnosis for most problems with blue spruce has been *Rhizosphaera* needlecast or *Cytospora* branch canker. However, a recent survey by Michigan State University researchers suggests two other fungal pathogens, *Diplodia* and *Phomopsis*, were much more commonly associated with branch death and tree decline than *Cytospora* (Photos 8-9). *Diplodia* and *Phomopsis* are both considered weak or

secondary pathogens, so it is unclear at this point why they appear to cause major disease problems for spruce. Also, in many cases there may be more than one issue that is affecting your tree's health.



Photos 8-9. Left, Decline symptoms moving upward. Right, Wood staining on branch with Phomopsis canker. Photo credits: Left photo, Christine McTavish, [MSU \(Michigan State University\)](#); right photo, Dennis Fulbright, [MSU \(Michigan State University\)](#) ([Michigan State University](#)).

Can I do anything about these spruce problems?

As with any tree health problem, the first step in dealing with declining spruce trees is to diagnose the problem and identify the cause. For large or important landscape trees, homeowners should contact a professional arborist or tree care company.

For some disease issues, such as needlecasts, fungicides may be effective in preventing or controlling the disease. It is important to note that fungicide treatments for needlecasts only protect new growth. For control to be fully successful, it may take two to three years of yearly fungicide applications. For canker diseases, the effectiveness of fungicides is usually limited. Removing affected branches is usually the best action to improve the tree's appearance and slow the spread of disease within the tree.

For insect or mite issues, insecticides or miticides can be effective, however selection of the proper product and timing are critical.

Should we continue to plant blue spruce trees?

This is a difficult question. Although spruce decline is widespread and appears to be increasing, it is not a certainty that all trees will be affected. In fact, it is not uncommon to see healthy, thriving spruce trees near or adjacent to trees that are in severe decline. Another complicating factor is that trees may be healthy for a number of years and then begin to decline as they mature and are more difficult and costly to remove.

The likelihood of having success can be improved by planting blue spruce trees on sites with conditions they favor. Key site factors for blue spruce trees are full sunlight, good air movement and excellent soil drainage.

Michigan State University

Extension recommends homeowners diversify their landscapes to help make their landscapes more resilient to pest and environmental changes, and seek to plant a variety of species wherever possible.



Blue spruce does best on exposed sites with good soil drainage. Photo credit: Bert Cregg, MSU

Additional resources

- [Alternative conifers for Michigan landscapes](#) for suggested alternatives to blue spruce trees from [MSU \(Michigan State University\) Extension](#)
- [MSU \(Michigan State University\) Extension website](#) for up to date information on spruce decline research
- [Gardening in Michigan website](#) for more information on planting and caring for trees in the landscape

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What is an Invasive Plant?

• An "invasive" plant is a non-native plant that infests natural areas and causes environmental or economic harm, or harm to human health. Of the roughly 2,900 plant species growing outside of cultivation in Indiana, approximately 33% are non-native but only a small fraction of those non-native species are invasive. Invasive plants degrade and destroy thousands of acres of our natural plant communities in Indiana. Each year millions of dollars are spent to control them.

• Many of these invasive species have been used in landscaping, but to reduce further infestations most are being considered for a rule that would make it illegal to buy, sell, or plant them in Indiana. We encourage you to look for alternatives (see back panel for more information).

Why Should I Care?

• Invasive plants cost money. A 2012 survey of 120 agencies and landowners in Indiana found we spent \$5.7 million to manage these species and protect our natural areas. Nationally, agricultural and control costs due to invasive plants are estimated at \$15 billion per year. Each year the cost grows.

• Invasive plants hurt wildlife by crowding out the plants our native animals need for food and cover.

• Most invasive shrubs and trees are little used by native insects. This reduces habitat for beneficial pollinators and predatory insects, as well as reducing the amount of food available for birds to feed their nestlings.

• Invasive plants destroy habitat for rare wildflowers and animals, threatening two-thirds of all endangered species.

• Invasive plants can become weedy in a home garden, crowding out other landscaping.

• Invasive plants can also decrease your ability to enjoy hunting, fishing, mushroom collecting, bird-watching, and many other recreational pursuits by crowding forest floors and choking waterways, making use of these areas difficult.

Garlic Mustard

Alliaria petiolata

F, O

Description: Biennial; first year rosettes of kidney-shaped leaves overwinter; second year plants grow up to 4-feet tall with triangular sharp-toothed leaves and small, white 4-petaled flowers in a cluster at top of stem; fruits are upright, thin, cylindrical pods; plant has garlic odor.

Problem: Displaces wildflowers; poisons the soil, inhibiting fungi that are important to tree and plant growth; has leaf chemicals that kill native butterfly larvae that feed on the plant.



Habitat codes (found in upper right corner of species descriptions): F: Forest, O: Open Land, W: Wetland

Purple Loosestrife

Lythrum salicaria

W

Description: Perennial with stout stems to 7-feet tall; stems are square or octagonal; leaves clasping, lance-shaped, opposite, rarely alternate or whorled; rose-purple flowers with 5-6 petals clustered in terminal spikes.

Problem: Decreases wetland bird nesting and foraging, changes water chemistry, and crowds out native species.



Callery (Bradford) Pear

Pyrus calleryana

F, O

Description: Deciduous tree to 30-feet tall; leaves alternate, ovate, smooth, finely toothed and wavy-edged, shiny green above and paler below; flowers white, 5 petals, in dense clusters, unpleasant odor; small, round, brown fruits.

Problem: Produces large number of fruits which are spread by starlings; can establish densely in forest understorey and outcompete native trees.



Japanese Honeysuckle

Lonicera japonica

F, O

Description: Woody, semi-evergreen, climbing vine; leaves opposite and oval, smooth margin, sometimes lobed; flowers white, fragrant, in pairs, and turn yellow with age; fruits are black berries.

Problem: Vines cover native plants and out-compete them for light; root system outcompetes native plants for water and nutrients.



Other Invasives in Indiana

The official list of invasive plants found in Indiana is at <http://www.entm.purdue.edu/iisc/invasiveplants.php>. Many of these plants are illustrated in this brochure, but additional plants from the list that are threatening Indiana natural areas are listed below. Avoid planting these, and learn to recognize and eliminate them before they spread. The habitat where they most often occur is indicated.

F: Forest O: Open Land W: Wetland

Flowers:

Canada Thistle, <i>Cirsium arvense</i>	O
Lesser Celandine, <i>Ranunculus ficaria</i>	F
Japanese Chaff Flower, <i>Achyranthes japonica</i>	F, O
Plumeless Thistle, <i>Carduus acanthoides</i>	O
Crown Vetch, <i>Securigera varia</i>	O
Dame's Rocket, <i>Hesperis matronalis</i>	F, O, W

Grasses:

Common Reed, <i>Phragmites australis australis</i>	O, W
Reed Canarygrass, <i>Phalaris arundinacea</i>	F, O, W

Vines and Groundcovers:

Periwinkle, <i>Vinca minor</i>	F, W
English Ivy, <i>Hedera helix</i> and <i>H. hiibernica</i>	F
Japanese Hops, <i>Humulus japonicus</i>	F, O, W
Kudzu, <i>Pueraria montana</i>	F, O
Porcelain Berry, <i>Ampelopsis brevipedunculata</i>	F
Sweet Autumn Clematis, <i>Clematis terniflora</i>	O
Wisteria, <i>Wisteria sinensis</i> and <i>W. japonica</i>	F

Shrubs:

Bicolor Lespedeza, <i>Lespedeza bicolor</i>	F, O
European Black Alder, <i>Alnus glutinosa</i>	F, O
Privet, <i>Ligustrum obtusifolium</i> , <i>L. vulgare</i>	F
Highbush Cranberry, <i>Viburnum opulus v. opulus</i>	F, W
Jetbead, <i>Rhodocypus scandens</i>	F

Trees:

European Black Alder, <i>Alnus glutinosa</i>	F, O
Princess Tree, <i>Paulownia tomentosa</i>	F
Sawtooth Oak, <i>Quercus acutissima</i>	F, O
Siberian Elm, <i>Ulmus pumila</i>	O
Tree of Heaven, <i>Ailanthus altissima</i>	F, O
White Mulberry, <i>Morus alba</i>	F, O, W

What Can We Do?

• Avoid using invasive plants in your garden; ask your nursery for native, non-invasive alternatives, and do the research to ensure that the plants you are purchasing and installing are not considered invasive in your ecoregion.

• Scout your property for invasive species, and remove them before they become a problem. Plant appropriate non-invasive native species as necessary to replace the invasive species you remove.

• Alert people in your neighborhood and work place about the problem of invasives and what species to watch for.

• Volunteer to help remove invasives at local parks and natural areas.

• Report invasive plants through Report IN (website below)

For More Information

Identification and Control:

<http://www.invasive.org/>

Indiana Invasive Species Council:

<http://www.entm.purdue.edu/iisc/>

Report IN—Reporting Invasive Species in Indiana:

<http://www.eddmaps.org/indiana/>

Landscaping with Non-Invasive Plants:

<http://www.inpaws.org/landscaping/>

Credits

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Indiana Native Plant
& Wildflower Society

INVASIVE PLANTS IN INDIANA

PRETTY...



AWFUL!

Callery (Bradford) Pear

Multiflora Rose

F, O

Rosa multiflora

Description: Multi-stemmed, thorny shrub to 15-feet tall; leaves alternate, pinnately compound with 7-9 leaflets and feathery stipules at the base of the leaf stalk; large clusters of ¼-1 inch wide white to pink flowers; many ¼ inch round red fruits.

Problem: Forms dense thorny thickets that invade pastures and crowd out native species.

**Burning Bush**

F, O

Euonymus alatus

Description: Deciduous shrub to 15-feet tall and wide; opposite leaves oval to obovate and finely toothed, 1-3 inches long and ½ to 1¼ inches wide, stalkless or nearly so; leaves turn bright red in fall, pink in shade; green to brown stems often have 2-4 prominent corky wings; small green flowers with 4 petals.

Problem: Creates dense thickets in forest understory, displacing native plants.

**Asian Bush Honeysuckle**

F, O, W

Lonicera maackii, *L. morrowii*, *L. tatarica*, *x bella*, *x muendeniensis*, and *xylosteloides*

Description: Shrub to 15-feet tall; leaves opposite, simple, oval to oblong with smooth margin, *L. maackii* with short pointed tip; flowers in pairs, fragrant, white in *L. maackii* and *L. morrowii*, pink to purplish red in *L. tatarica*, variable in the hybrids; berries red, orange, or yellow.

Problem: Dense shrub growth shades out plants on the forest floor; it reduces the growth and regeneration of trees, reduces nesting bird success, and increases ticks and tick-related illnesses.

**Common and Glossy Buckthorn**

F, O, W

Rhamnus cathartica and *Frangula alnus*

Description: Shrub or small trees. Common buckthorn leaves (left) subopposite with toothed margin and distinctive parallel veins; flowers greenish, inconspicuous with 4 petals; fruit (lower left) black. Glossy buckthorn leaves (right) alternate with smooth margin, glossy and oval; leaves have distinctive parallel veins; stem has speckled appearance; flowers greenish, inconspicuous with 5 petals; fruit (lower right) red to purplish black.

Problem: Common buckthorn is the overwintering host for soybean aphid and alternate host for oat crown/leaf rust; changes nutrient cycling and reduces leaf litter layer. Glossy buckthorn reduces growth and survival of young trees.

**Japanese Barberry**

F

Berberis thunbergii

Description: Shrub; leaves small, round to ovate, green or reddish purple, and in clusters around a spine; cross section of stem is bright yellow; yellow, umbrella-shaped flowers in clusters of 2-4; fruit small, pendant, bright red, and egg-shaped.

Problem: Significantly increases tick populations and tick-borne illnesses; changes soil microbial community and nutrient cycling.

**Autumn Olive**

F, O

Elaeagnus umbellata

Description: Deciduous shrub to 20-feet tall; leaves alternate, oblong, dark green above, and silvery underneath; stems often have thorn-like shoots; flowers are fragrant, cream turning to yellow, and tube-shaped with four spreading lobes; fruit reddish-pink and speckled.

Problem: Increases soil nitrogen, which increases invasion by other non-native species.



Habitat codes (found in upper right corner of species descriptions): F: Forest, O: Open Land, W: Wetland

Norway Maple

F

Acer platanoides

Description: Deciduous tree; leaves opposite and palmate with 5-7 lobes, can be purple-leaved; widely spreading winged fruit; milky sap in petioles which are 3-4 inches long; gray bark.

Problem: Regenerates prolifically under forest canopy and displaces native trees, shrubs and herbs.

**Asian Bittersweet**

F, O

Celastrus orbiculatus

Description: Woody, deciduous, climbing vine; leaves alternate, ovate to round, abruptly sharp-pointed and glossy; small greenish flowers occur in clusters in the leaf axils; yellow, papery coat surrounding capsule splits to reveal red-orange fruit in leaf axils in fall. American Bittersweet (*C. scandens*) is similar but fruit reddish, with orange papery coats, and in terminal clusters, not in leaf axils.

Problem: Climbs up and overtops trees, making them more vulnerable to windthrow; twining stems girdle or kill trees; hybridizes with native bittersweet, with the hybrids out-competing the native species.

**Wintercreeper**

F, O

Euonymus fortunei

Description: Evergreen, woody, clinging vine; dark green or variegated thick, egg-shaped opposite leaves with toothed margins; stems narrow, warty, with rootlets; flowers green-white on long stalks; fruits pinkish to red capsules that split open to expose orange fruits.

Problem: Outcompetes native vegetation by depleting soil moisture and nutrients, blocking sunlight, and by forming a dense vegetative mat that impedes the growth of seedlings of native species.

**Japanese Stiltgrass**

F, O

Microstegium vimineum

Description: Annual, sprawling grass to 4-feet tall; leaves pale green, lance-shaped, 1-4 inches long, with a silvery stripe on midrib; small flower spikes appear in late summer.

Problem: Grows densely, displacing native plants; increases heat and duration of forest flames, killing tree seedlings.

**Chinese Maiden Grass**

O

Miscanthus sinensis

Description: Perennial to 8-feet tall; long leaves have silver midrib; flower spikes 8-10 inches long, persist into winter as silvery plumes.

Problem: This common landscaping plant can spread easily out of plantings, displacing native vegetation.

**Japanese and Giant Knotweed**

F, O

Reynoutria japonica, *R. sachalinensis*, and *R. x bohemica*

Description: Rhizomatous perennial to 10-feet tall; aggressively spreads by rhizomes; stems hollow with membranous sheath surrounding stem above swollen nodes; leaves alternate, oval, and pointed at tip; flowers are small greenish-white, in clusters in leaf axils.

Problem: Forms dense thickets; causes serious damage to building foundations, decreases wildlife habitat, increases erosion and sedimentation.

