# An Insect Pest Review/Preview

In this rogue's gallery of bug thugs, we call attention to the insect pests you'll want to watch for. First up, weevils, sawflies and a few others; next time, scales, coneflower culprits and even more oddities.

**PART 1**

*By Joe Boggs*

Mid-winter is not typically the time of the year when we turn our attention to insect pests. After all, few insects are actually out and about in a large part of the U.S. However, it's a good time to review past growing seasons with an eye toward learning what to be on the lookout for this coming season. This review covers some six-legged pests that appeared on the scene as plant marauders or just curiosities in 2015. Look closely; you may see them again in 2016!

Shothole leaf damage is caused by the tiny European elm flea weevil.

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## Worrisome weevils

Yellow poplar weevil produces aesthetic damage on magnolia leaves.

**Yellow poplar weevil** (*Odontopus calceatus*) is a native pest that occasionally rears its snouted head to produce localized outbreaks. Although the weevil is not considered a tree-killer, adult leaf-feeding damage coupled with larval leafmining activity can produce noticeable damage to its tree hosts, which include magnolia (*Magnolia* spp.), sassafras (*Sassafras albidum*) and, of course, tulip poplar (*Liriodendron tulipifera*).

The small (3/16-inch-long), oval-shaped weevils (order Coleoptera; family Curculionidae) range in color from black to brownish black to reddish brown and have deeply grooved wing covers (elytra). They are good fliers; however, the weevils often elect to fold their legs, drop to the ground, and "play dead" when disturbed; it's a defense strategy that is common among weevils. In the eyes of some people, yellow poplar weevils resemble ticks, causing some to think they are seeing "flying ticks" during outbreak years. Of course, ticks can't fly.

The weevils overwinter as adults and can cause some noticeable damage in the spring. Once these adults mate, lay eggs and die, their disappearance may cause some to think the onslaught is over for the season. However, new adults emerge in mid-summer to wreak more havoc; the "summer generation" causes the most damage. Thankfully, localized outbreaks are usually followed by many years with weevils being almost nondetectable.

**European elm flea weevil** (*Orchestes alni*) was first detected in the U.S. in 1982. The weevils were at one time considered an oddball pest of Siberian elms (*Ulmus pumila*) and generally relegated to the "who cares" pest category. However, in recent years, damaging populations have become common on American elm (*U. americana*), particularly in the Atlantic States and Upper Midwest. Indeed, this non-native pest attacks all species of elms.

The small (2/16-inch-long) adults are reddish brown with black spots. They have enlarged, strong hind legs, giving them the ability to jump when disturbed, thus the common name "flea weevil." Adults produce small feeding holes in newly emerging leaves, and females produce

additional damage by laying eggs into mid-rib veins and major lateral veins of the leaves. As leaves expand, the feeding holes become larger and more apparent, producing the characteristic "shothole" leaf damage associated with this weevil; elm leaves look like they've been blasted by a shotgun.

Damage caused by oviposition also becomes more noticeable with leaves failing to fully expand beyond the vein wounding, and the affected area turning yellow and curling downward. Once the eggs hatch, larvae begin feeding as leafminers tunneling through the leaf tissue toward the margins of the leaves.

Performing the "sawfly stomp dance" on willow sawfly is an effective method of eradicating a localized infestation.

## Willow woes

**Imported willow leaf beetle** (*Plagiodera versicolora*) is native to the Mediterranean region and was first found in the U.S. in the early 1900s. Periodic localized population outbreaks continue to occur, causing extensive damage including complete defoliation of all types of willows (*Salix* spp.). The iridescent dark-blue to bluish green adults measure around 2/16-inches in length. Their feeding damage appears as small holes in leaves. The shiny, dark-green larvae feed as skeletonizers, producing damage that looks very similar to the symptoms produced by Japanese beetle (*Popillia japonica*) adults.

Both the adults and larvae are armed with a serious chemical defense against predators. When threatened, they secrete a foul smelling fluid from glands located on the sides of their bodies. Thankfully, this does not dissuade some predators, such as assassin bugs and lady beetles, from chowing down on the beetle larvae. Their predation is one reason localized outbreaks are usually followed by years with very few leaf beetles.

**Willow sawfly** (*Nematus ventralis*) may be found on a wide variety of willows, especially purple willow (*S. purpurea*), Japanese fantail willow (*S. sachalinensis*), Miyabe willow (*S. miyabeana*), heartleaf willow (*S. eriocephala*) and their hybrids. Despite its common name, this sawfly will occasionally feed on poplars (*Populus* spp.). Although outbreaks are rare, when they do occur this sawfly can cause extensive leaf damage resulting in stunted twig growth.

The striking looking larvae are shiny black with a row of slightly raised, orangish yellow spots along the sides of their body. As with many types of sawfly larvae, when disturbed willow sawfly will form their bodies into an "S" shape (S for sawfly?). This species carries the approved common name of "willow sawfly" by the Entomological Society of American (ESA). However, there is also another sawfly species found in North American that feeds on willow. *Nematus oligospilus* has no common name approved by the ESA, but it is also commonly referred to as the "willow sawfly." Larvae of this species are much less colorful; their head capsules are flesh colored, and their bodies are light green with faded green and white longitudinal stripes.

Willow sawfly larvae feed in colonies that typically include five to 10 individuals. Early instars produce holes and notches in leaves, while late instars consume entire leaves. Heavy defoliation is rare, so this sawfly is seldom considered a serious pest of established willows. However, since this sawfly has two generations per season, the impact of the second generation on newly planted trees may be significant. Control options include simply knocking the colonies into a bucket of soapy water or onto the ground and doing the "sawfly stomp dance." Appropriately labeled insecticides are also effective.

Remember that although these and many other types of leaf and needle-feeding sawfly larvae strongly resemble caterpillars, they are *not* susceptible to caterpillar-killing insecticidal products based on the naturally occurring bacterium, *Bacillus thuringiensis* (Bt). Sawflies are related to wasps (order Hymenoptera); caterpillars grow up to become

Feeding by the imported willow leaf beetle can cause complete defoliation of all types of willows.

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moths and butterflies (order Lepidoptera). A handy way to separate sawfly larvae from caterpillars is to count the number of prolegs. Starting at the head and working your way back, the first three pairs of hardened legs are the thoracic legs. The next pairs of fleshy legs are called prolegs; they are lost during pupation. Sawfly larvae have six or more pairs of prolegs. Caterpillars have five or fewer pairs of prolegs—the same number of pairs as fingers on one of your hands.

Colonies of redheaded pine sawfly can cause rapid defoliation.

## More sawflies

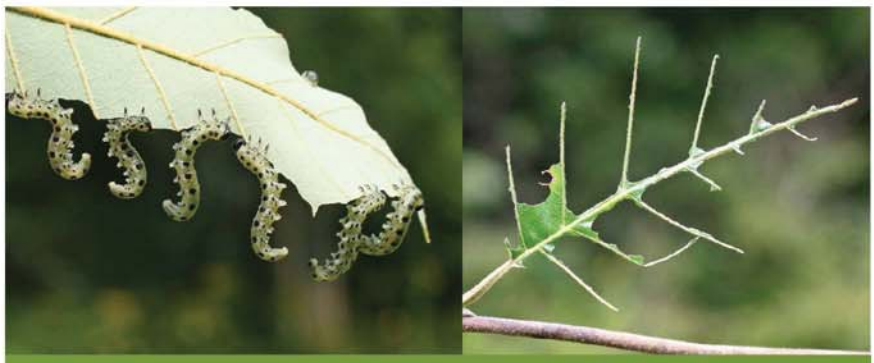
**Dusky birch sawfly** (*Croesus latitarsus*) is a native pest that is commonly found feasting on river birch (*Betula nigra*). Indeed, the sawfly shows such a distinct preference for river birch that an alternate common name is "river birch sawfly." Dusky birch sawfly larvae also feed in colonies that may number 10 to 20 individuals. All instars have shiny black head capsules and distinct black spots on their bodies. As with the willow sawfly, when disturbed, the larvae form their bodies into an "S" shape. Early instar larvae are dark gray, middle-instars are greenish gray, and late instars are yellowish green. Early instars consume all of the leaf except for the mid-vein and main lateral veins; late instars consume entire leaves.

This sawfly has two generations per season with the second generation typically causing the most damage owing to larger numbers of larvae compared to the first generation. To avoid heavy damage, trees should be closely monitored for the appearance of the first generation and early instars targeted. Appropriately labeled standard pyrethroid insecticides are effective; however, they may kill beneficial insects that help to naturally suppress year-to-year populations of this sawfly pest. The "sawfly stomp dance" also works well and will preserve the bio-allies.

**Redheaded pine sawfly** (*Neodiprion lecontei*) was a frequent topic of conversation in 2015 at gatherings of nursery and landscape managers as well as Christmas tree growers. It has two generations per season. The larvae feed in colonies numbering 10 to 20 strong and can produce rapid defoliation. Worse, if the larvae run out of needle-food, they will strip bark to consume the sugar-rich phloem, causing serious stem damage and often producing stem dieback.

The larvae of this native sawfly may be found feeding on Scotch (*Pinus sylvestris*), jack (*P. banksiana*), shortleaf (*P. echinata*), loblolly (*P. taeda*), slash (*P. elliottii*), red (*P. resinosa*) and mugho (*P. mugo*) pines, with white (*P. strobus*) and Austrian (*P. nigra*) pines serving as occasional hosts. The larvae range in color from light yellow to greenish yellow, and they have longitudinal rows of black markings running the length of their bodies. Their shiny, bulbous head capsules are reddish orange with two black eye spots; however, the head capsules of newly molted larvae may be tawny brown. Redheaded pine sawfly spends the winter as pre-pupae inside cocoons in the soil or duff beneath host trees. Pupation and adult emergence occurs in the spring.

Most insecticides labeled for application to pines will provide effective control, as will performing the aforementioned "sawfly stomp dance."



Dusky birch sawfly larvae, seen in characteristic defense posture, inflict dramatic damage on river birch.

## Major miner problem

**Boxwood leafminer** (*Monarthropalpus flavus*) is a non-native midge fly that is continuing to produce high populations almost annually throughout the eastern and Midwestern U.S. Females strongly resemble mosquitoes with orangish red abdomens. They use their sharp ovipositors to insert eggs between the upper and lower leaf surfaces of boxwood leaves in late spring. The resulting yellowish orange larvae (maggots) spend the remainder of the season developing through the 1st and 2nd instar stages as they consume interior leaf tissue to produce blister-like mines. Late-season mines may be evident but remain green, masking their appearance.

Winter is spent as 3rd instar larvae inside the blister mines. In the spring, the larvae resume feeding and develop through a 4th instar stage. During this time, mines expand rapidly, and damage becomes evident with mined leaves turning from yellow to orangish

Boxwood leafminer damage can be mistaken for winter damage, but the telltale blister mines created by larvae give foliage a blotched appearance.

brown. The leafminer damage mimics winter injury.

Neonicotinoid systemic insecticides provide effective control but should be applied after boxwoods have bloomed to reduce negative impacts on pollinators.

## Insect oddities

**Kissing bugs** (family Reduviidae, subfamily Triatominae) were in the news in mid-November when it was incorrectly reported by numerous national and local news outlets that these insects were spreading across the U.S. The inflammatory headlines usually included references to the bugs carrying a "deadly parasite." Kissing bugs are also called "conenose bugs" because of their elongated, cone-like heads. These are not plant pests, but the spurious reports had an impact on several insect predators that help to reduce insect plant pest populations.

There are several species of kissing bugs and all are native to the Americas; they have long been a health-risk problem in South and Central America. They are sucking insects, and their common name comes from their habit of using their piercing-sucking mouthparts to feed around the mouth of an unsuspecting, sleeping victim; it looks like they're kissing the person. The "deadly parasite" referenced in the news reports is a parasitic protozoan, *Trypanosoma cruzi*, that causes Chagas disease. The protozoan is released when the bug defecates as it feeds and the protozoan enters the feeding wounds. Chagas disease is potentially deadly; African sleeping sickness is caused by another trypanosoma species and is sometimes called African human trypanosomiasis. Although the African disease involves another species and a completely different insect vector, the human disease symptoms and possible deadly outcome are similar to Chagas.


The notorious kissing bug—*Triatoma sanguisuga*

While this all sounds scary, the fact is that Chagas remains exceedingly rare in the U.S. even though kissing bugs are not new to the U.S. I took this image of a bloodsucking conenose (*Triatoma sanguisuga*) that I collected on the side of my home in 2010 in southern Ohio. A scientific paper published in 1960 reported that this species is found in southern Ohio, although it's not *commonly* found. However, the bottom line is the kissing bugs are not "new" to the U.S.; according to the CDC, they can be found in 26 states.

Here is the challenge: There are several members of the Reduviidae that are excellent insect biocontrol agents, including the wheel bug (*Arilus cristatus*, subfamily Harpactorinae). Wheel bugs use their sucking mouthparts to extract the "essence of insect" from soft-bodied insects including caterpillars and sawfly larvae (see above!), which means they are an important bio-ally for managing plant pests. Unfortunately, their family resemblance to their kissing cousins, coupled with the recent hoopla over the mistaken belief we're being over-run by bugs from south of the border, may place these and other related beneficial bugs in the crosshairs of insecticidal applications. Look close before you shoot!

*Part II of "An Insect Pest Review/Preview" will appear in the March 2015 issue.*

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