The bronze birch borer is a beetle that attacks all kinds of birch with white birch being more prone to infestation over river birch. Symptoms include dieback, bubbling of the bark “D” shaped exit wounds (holes), coupled with brown stains.

The birch leaf miner is a sawfly. The tissues inside the leaves are eaten by the insect larvae starting in early spring. Leaves turn yellow and brown out in July and August.

Heavily infested trees become weakened over time, which sounds the dinner bell for other insects and subsequent disease. This problem is indeed treatable.

Leaf Miner

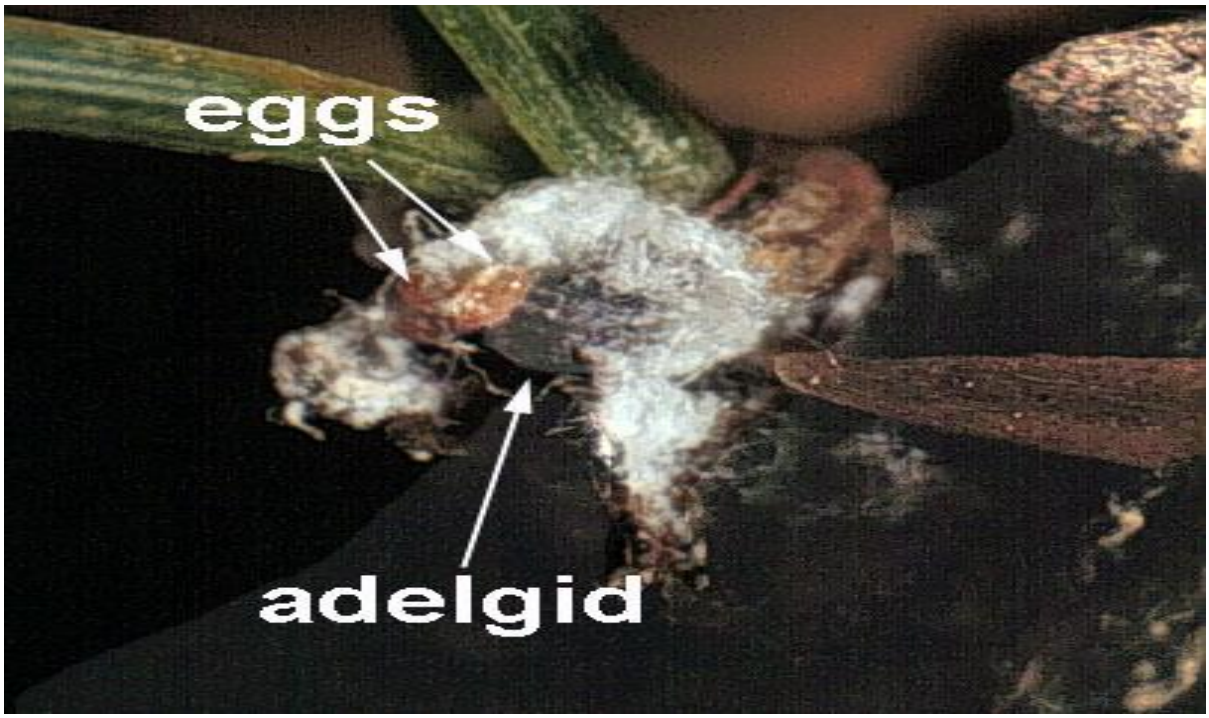
The name "leaf miners" is a catchall term for certain moth, beetle and fly larvae that tunnel between the upper and lower surfaces of leaves.

Leaf miners feed inside the leaf. Developing mines will show up as tiny translucent spots of lighter green color than the rest of the leaf when leaves are held up to the light. The larvae tunnel through the leaf forming blotches and discoloration. As the miners move to the outer edge of the leaf, the leaf turns brown. The larvae finish feeding in late June or early July and then fall to the ground where they pupate. There are at least two generations per year.

Good control depends on early, timely spraying for the first generation of leaf miners and larvae to prevent appreciable numbers in any later generations.

Lace bugs are usually host-specific and can be very destructive to plants. Most feed on the undersides of leaves by piercing the epidermis and sucking the sap. The then empty cells give the leaves a bronzed or silvery appearance. Each individual usually completes its entire lifecycle on the same plant, if not the same part of the plant.

Most species have one to two generations per year, but some species have multiple generations. Most overwinter as adults, but some species overwinter as eggs or nymphs. This group has incomplete metamorphosis in that the immature stages resemble the adults, except that the immatures are smaller and do not have wings. However, wing pads appear in the second and third instars and increase in size as the nymph matures. Depending on the species, lace bugs have four or five instars.



Adelgids are often known as "woolly conifer aphids". The family is composed of species associated with pine spruce or other conifers, known respectively as "pine aphids" or "spruce aphids".

There are about fifty species of adelgids known. All of them are native to the northern hemisphere, although some have been introduced to the southern hemisphere as invasive species.[3][4] Unlike aphids, the adelgids have no tail-like cauda and no cornicles.[5]

Adelgids only lay eggs, and never give birth to live nymphs as aphids do. Adelgids are covered with dense woolly wax. A complete adelgid life cycle lasts two years.[5] Adelgid nymphs are known as sistentes, and the overwintering sistentes are called neosistens.[6]

Aphids are among the most destructive insect pests on cultivated plants in temperate regions.[1] The damage they do to plants has made them enemies of farmers and gardeners the world over. From a zoological standpoint they are a highly successful group of organisms.[2] Their success is due in part to the asexual reproductive capabilities of some species.[*citation needed*]

About 4,400 species are known, all included in the family Aphididae.[3] Around 250 species are serious pests for agriculture and forestry as well as an annoyance for gardeners. They vary in length from 1 to 10 millimeters (0.04 to 0.39 in).

Similarly, adelgids also feed on plant phloem. Adelgids are sometimes described as aphids, but are more properly classified as aphid-like insects, because they have no cauda or cornicles.[1]

The white pine weevil is considered the most destructive insect pest of eastern white pine in North America. This species kills the terminal leader primarily of eastern white pine. Colorado blue, Norway, and Serbian spruces, Scots, red, pitch, jack, and Austrian pines, and occasionally Douglas-fir are also attacked. Trees become susceptible to injury when they reach a height of about three feet. The white pine weevil prefers to attack trees exposed to direct sunlight. The adult is a small rust-colored weevil that is about 4-6 mm long. It has irregularly shaped patches of brown and white scales on the front wings. Near the apex of the front wings is a large white patch. Like most weevils, the adult has a long snout-like beak from which small antennae arise. The larval stage, which lives beneath the bark, is white with a distinct brown head. When mature, the larva is approximately 7 mm long, legless, and slightly C-shaped. The first symptom evident from successful attack by this pest is glistening droplets of resin on terminal leaders of the host plant in late March and April. This is the result of punctures made by adults in the process of feeding and cutting egg-laying sites.

Most damage is done by the larval stage. Larvae are found just under the bark of infested terminals from May through July. Larvae chew and burrow completely around the stem causing the current year's growth to wilt, droop, and eventually die. One or more side branches (laterals) may then bend and grow upward to take over as the terminal leader. At this point the tree is now permanently crooked. For several years after successful attack by this pest, a few more laterals may grow as leaders. This condition may result in a forked tree.

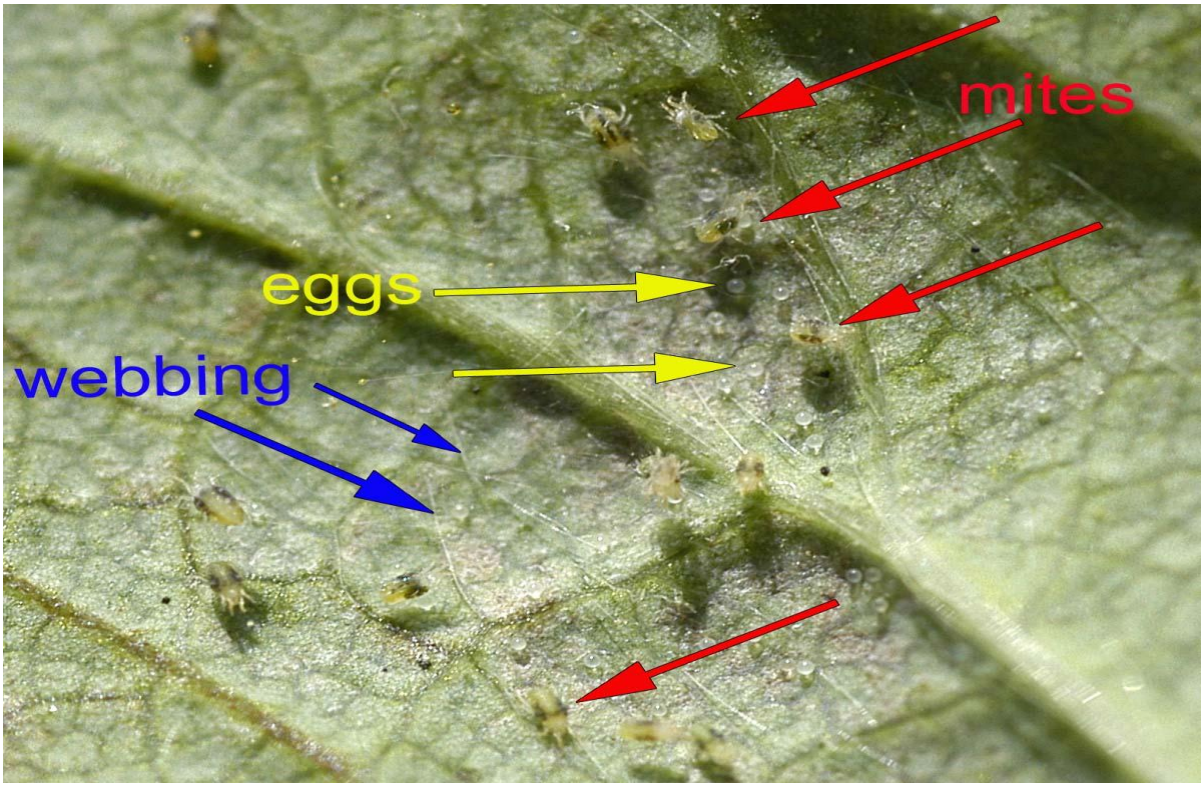
Bagworms, *Thyridopteryx ephemeraeformis*, produce conspicuous spindle-shaped cocoons on trees and shrubs throughout the United States. Bagworms feed on over 128 plant species. The most commonly attacked plants are arborvitae, red cedar, and other juniper species. They will also feed on fir, maple, juneberry, buckeye, persimmon, ginkgo, honeylocust, larch, sweet gum, spruce, pine, sycamore, poplar, oak, locust, willow, and hemlock.

The principle harm done by the insect is the destruction of foliage by the caterpillars. Plants usually are partially defoliated, weakened, and rendered unsightly. Complete defoliation can occur. The most notable sign of bagworm infestation is the presence of protective bags attached to a branch. The bags incorporate bits of twigs and leaves from the host plant. They are approximately 1 to 2 inches long and resemble Christmas tree ornaments hanging from the limbs.

The adult female bagworm does not look like a moth and never leaves her bag. She is maggot-like in appearance, soft-bodied, and yellowish-white. A mated female lays between 500 and 1000 eggs within the bag, after which she dies. The eggs remain inside the bag throughout the winter until they hatch the following spring. There is one generation a year.

From late May to mid-June, bagworm larvae (caterpillars) begin emerging from the bags. Almost immediately after emerging, a larva starts to produce its own protective bag. The bag is constructed such that the larva's head and legs are free. This construction allows the larvae to move about the plant as it feeds on the foliage. As the larva grows, it increases the size of its bag. The full-grown larvae are about one inch long.

When a host plant becomes defoliated, the larvae will crawl off it with their bags and search for a new plant to feed upon. In mid-August, the mature larvae stop feeding and attach their bags to a twig. They close up the bag and pupate. By mid-September, the bagworm has completed its development, and adult males begin emerging from their bags. The male moth has a black, furry body and feathery antennae. The wings are almost transparent and have a span of about one inch.



Spider mites are members of the Acari (mite) family **Tetranychidae**, which includes about 1,200 species.[1] They generally live on the undersides of leaves of plants, where they may spin protective silk webs, and they can cause damage by puncturing the plant cells to feed.[2] Spider mites are known to feed on several hundred species of plants.

Spider mites are less than 1 millimetre (0.04 in) in size and vary in color. They lay small, spherical, initially transparent eggs and many species spin silk webbing to help protect the colony from predators; they get the "spider" part of their common name from this webbing.[2]

Hot, dry conditions are often associated with population build-up of spider mites. Under optimal conditions (approximately 80 °F or 27 °C), the two-spotted spider mite can hatch in as little as 3 days, and become sexually mature in as little as 5 days. One female can lay up to 20 eggs per day and can live for 2 to 4 weeks, laying hundreds of eggs.

Scale is a major pest of fruit and ornamental trees. It is inconspicuous and usually not noticed until large numbers cover the limbs.

Scale infects branches, shoots, leaves, and fruit. They suck the plant juices and weaken branches and main scaffold limbs causing permanent injury to mature trees. Limbs become covered with soft or hard shell scales in masses, and the leaves wilt and die, with oozing often present.

Scale insects vary dramatically in appearance; some are very small organisms (1–2 mm) that grow beneath wax covers (some shaped like oyster shells, others like mussel shells), to shiny pearl-like objects (about 5 mm), to creatures covered with mealy wax. Adult female scales are almost always immobile (aside from mealybugs) and permanently attached to the plant they have parasitized. They secrete a waxy coating for defense; this coating causes them to resemble reptilian scales or fish scales, hence their common name.

Tent caterpillars are readily recognized because they are social, colorful, diurnal and build conspicuous silk tents in the branches of host trees. Some species, such as the eastern tent caterpillar, *Malacosoma americanum*, build a single large tent which is typically occupied through the whole of the larval stage, while others build a series of small tents that are sequentially abandoned. Whereas tent caterpillars make their tents in the nodes and branches of a tree's limbs, webworms enclose leaves and small branches at the ends of the limbs.

Tent caterpillars hatch from their eggs in the early spring at the time the leaves of their host trees are just unfolding. The caterpillars establish their tent soon after they eclose. The tent is constructed at a site that intercepts the early morning sun. The position of the tent is critical because the caterpillars must bask in the sun to elevate their temperatures above the cool ambient temperatures that occur in the early spring.

Caterpillars grow rapidly and typically complete their larval development in seven to eight weeks. When fully grown, the caterpillars leave the natal tree and seek protected places on the ground or under the eaves of buildings to spin their cocoons. About two weeks later, they emerge as adults. Shortly after eclosing from the cocoon, the female moth secretes a pheromone which draws males to her. Mating typically occurs in the early evening and the mated female, already fully laden with eggs, typically oviposits the full complement later that same evening. The eggs are placed around the circumference of a branch and covered with a frothy material called spumaline. Spumaline is hydrophilic and prevents the eggs from drying out. It also serves as a protective covering which limits the ability of small wasps to parasitize the eggs. Although the male moth may live for a week or more, the female dies soon after laying her eggs. Thus, the whole of the female's adult life may take place in fewer than 24 hours.

During outbreaks, the caterpillars can become so abundant that they are capable of completely defoliating tens of thousands of acres of forest. Even though these outbreaks do not follow true cycles in the sense that they occur at regular intervals, some particularly prone regions have recorded outbreaks every ten years or so. Caterpillars rarely remain in outbreak numbers for more than two to three years.

For years lilies have been the carefree darlings of many perennial gardens. But then came the red lily leaf beetle. This European native found its way to Massachusetts in 1992 and has been spreading around New England ever since. If you grow Asiatic, Oriental, or Turk's cap lilies or fritillaria bulbs, you know these beetles. Daylilies, luckily, aren't affected.

The overwintering bright red adults emerge to feed in spring as soon as your lily plants start growing. In May they start laying bright orange eggs on the underside of the leaves. The eggs hatch within 1 week and the black, slug-like larvae start feeding. What's even worse is the larvae pile their own excrement on their back as a defense mechanism. Yuck. The larvae feed for up to 3 weeks causing damage to lily leaves, buds, and flowers.

Asian long-horned beetle This species has now been accidentally introduced into the United States, where it was first discovered in 1996,[1] This beetle is believed to have been spread from Asia in solid wood packaging material.

Adults are very large insects with bodies ranging from 1 to 1.5 cm (0.39 to 0.59 in) in length and antennae which can be as long as 4 cm (1.6 in) or 1.5–2 times longer than the body of the insect.[2] They are shiny black with about 20 white spots on each wing cover and long antennae conspicuously banded black and white. These beetles can fly, but generally only for short distances, which is a common limitation for Cerambycidae of their size and weight. The upper sections of the legs of the adults are whitish-blue. ALB can be distinguished from related species by the markings on the wing covers and the pattern of the antennae.[2]

Tree infestation can be detected by looking for exit holes 3/8 to 3/4 inches in diameter (1–2 cm) often in the larger branches of the crowns of infested trees. Sometimes sap can be seen oozing from the exit holes with coarse sawdust or "frass" in evidence on the ground or lower branches. Dead and dying tree limbs or branches and yellowing leaves when there has been no drought also signal ALB infestation.

Japanese Cedar Longhorned Beetle This beetle has been in New England, North Carolina, and the west coast for some time. It was found in Maryland in 2011 and is currently in northern Harford county and Elkridge in Howard county. It is a relatively small longhorned beetle (~3/8in). Females are reddish brown and males are black with reddish “shoulders.” Adults emerge mid-April through May. Hosts include arborvitae, cryptomeria, false cypress, Leyland cypress, and eastern redcedar (North Carolina). Other listed hosts include chamaecyparis, thujopsis, Juniper, Monterey cypress, firs, and pine. Damage appears as dead branches in sizes as small as a pencil to main trunks. The damage resembles winter dieback, so look carefully for oval exit holes about 4mm x 2mm. Peel back bark and look for tunnels.

The emerald ash borer is a small, green beetle that belongs to a large family of beetles known as the buprestids, or metallic wood boring beetles. The description is apt, as many of the adult buprestids are indeed glossy, appearing as if their wing covers are made of polished metal. The emerald ash borer, with its green, iridescent wing covers, fits right in. Adult EABs are relatively slender and between 0.3 to 0.55 inches in length - small by most standards but large compared to other buprestids.

During its life cycle, EAB undergoes a complete metamorphosis. It starts as an egg, becomes a larva (alternatively called a grub), changes to become a pupa and then is an adult. The life cycle of an EAB takes either 1 or 2 years to complete. Adults begin emerging from within ash trees around the middle of June. Emergence continues for about 5 weeks. The female starts laying her eggs on the bark of ash trees about 2 weeks after she emerges. After 7 to 10 days, the eggs hatch and the larvae move into the bark, to begin feeding on the phloem (inner bark) and cambium of the tree. Throughout each of its successive instars (larval growth stages), the larva continues to feed on the phloem and cambium of the tree. The larval stage may last for nearly two years. Before becoming an adult, the insect overwinters as a pre-pupal larva. It then pupates in the spring and emerges as an adult during the summer.

EAB feed on ash trees almost exclusively. While the larvae feed on the phloem and cambium, the adults feed on leaves. In Connecticut, there are three species of ash trees - the white ash (*Fraxinus americana*), the green or red ash (*F. pennsylvanica*) and the black ash (*F. nigra*). Despite its common name, mountain ash (*Sorbus* spp.) is not a true ash and does not attract the EAB.

Most boring insects attack stressed or injured trees. Healthy trees are better able to resist these insects through such means as the production of inhibiting chemicals. Native North American ash species did not evolve in the presence of EAB and so have not developed the mechanisms to recognize or cope with EAB as a problem. Even healthy native ash trees do not have the ability to effectively resist the onslaught of this invasive, exotic beetle.

The first symptom that an ash tree is infested with EAB is often thinning and dieback in the tree's upper canopy. This is because EAB infests the top of the tree first. However, there can be many causes for thinning and dieback in the crown of an ash tree, A definite sign of the EAB is the presence of a D-shaped exit hole in the bark of an ash tree. This hole is left by the emerging adult, as it chews its way out of the tree. There are several other borers that attack ash. None of them produces that same D-shaped hole. On other trees, other buprestids, such as the bronze birch borer and the two-lined chestnut borer, do produce D-shaped exit holes. These insects are not found in ash trees. The combination of a D-shaped exit hole and an ash tree is unique to EAB, and a sure indication that the insect is present.

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