

Boxelder Leafroller

July 2023

Marion Murray, IPM Specialist • Ryan Davis, USU Arthropod Diagnostician (No longer at USU)

Quick Facts



Fig. 1. Female (left) and male (right) boxelder leafroller moths. Image courtesy of U.S. Department of Agriculture (USDA) Forest Service - Ogden, Bugwood.org.

- Boxelder leafroller is a caterpillar that feeds on leaves of boxelder, raspberry, birch, elderberry, white elm, and various shrubs.
- It is a native species that usually occurs under low populations, but sometimes outbreaks can occur.
- Adult boxelder leafrollers are buff-colored moths with wingspans of about 1 inch. Males are slightly smaller than females.
- Mature larvae are almost 1 inch long, green, and very active when disturbed.
- Control is usually unnecessary, but if required, foliar sprays, including organic options, are available.

The boxelder leafroller, *Archips negundana*, is a pest of boxelder and other trees and shrubs in parts of the United States and Canada and is commonly found in Utah. Boxelder is the primary host, but damage can also occur on raspberry, birch, elderberry, white elm, and various shrubs.

Adult females are buff-colored moths with a wing span of approximately 1 inch. The undersides of their abdomens are dark colored. Males are similar in appearance but are slightly smaller and light yellow on the underside of

the abdomen. The larva is a greenish-yellow caterpillar that is 4/5 inch long when mature.

Life Cycle



Fig. 2. Boxelder leafroller larva. Image courtesy of Bill Klein, USDA Forest Service, Bugwood.org.

Boxelder leafroller overwinters as eggs in cracks and crevices on its host. Eggs hatch soon after budbreak and the young larvae crawl to developing leaves and feed in small groups.

As larvae mature, they disperse and feed individually in leaves they have rolled with webbing. If a larva is disturbed, it will wiggle and quickly drop from the tree, suspended by a silken thread.

Larvae typically complete development by mid-June and pupate (form cocoons) within the rolled leaves or in bark crevices. Pupation takes approximately 2 weeks.

In northern Utah, moths may be present from late June through July. During this time, females mate and lay eggs in flattened masses of about 30 eggs, in branch forks and bark crevices. The egg masses are covered with scales from the female's body and are difficult to detect. The eggs then hatch the following spring. There is one generation per year.

Symptoms



Fig. 3. Boxelder leafroller damage. Image courtesy of U.S. Department of Agriculture (USDA) Forest Service - Ogden, Bugwood.org.

Boxelder leafroller damage results from larval feeding on the leaves. Young larvae form webs along leaf folds and veins and consume the tissue between the veins. Older larvae roll individual leaves and may web several leaves together. Heavy infestations can result in complete defoliation of the tree by early to midsummer.

Boxelder trees can produce a second set of leaves if the first set is removed. Consequently, trees that are completely defoliated early in the growing season may appear nearly normal by the end of the summer due to leaf replacement. As a general rule of thumb, if a deciduous tree is well established, growing under good conditions, in a suitable site, and is not under additional stress, it can usually withstand about 30%-35% leaf loss before its capability to store food reserves is reduced. In fact, established boxelder trees that have been completely defoliated for 3 consecutive years have continued to live and grow normally. Their capacity to re-leaf compensates somewhat for the early season leaf loss.

Control

If controlling boxelder leafroller is desired to preserve a young tree's health or maintain the aesthetic or shade characteristics of a mature tree, apply an insecticide in spring as soon as you detect leaf damage or larvae.

Reaching treetops with insecticide spray application is often difficult for homeowners with large trees. With sufficient water pressure, use hose-end sprayers for trees up to 30 feet tall. Larger trees will require power equipment, and the cost may be prohibitive, depending on the value placed on the tree by the homeowner.

Organic insecticides labeled for leafroller control on boxelder, maple, or ornamental shade trees include products containing *Bacillus thuringiensis* (strains *aizawai* and *kurstaki*) and spinosad. The caterpillar must consume these products, which are only effective on caterpillars a half-inch or less. There are many residential and commercial brands that contain either of these ingredients.

Conventional options include carbaryl, malathion, and pyrethroids, and work on all caterpillar sizes.

Not all formulations containing the above active ingredients are suitable for use on trees. Before purchasing or applying any insecticide, check the label to be sure it lists the tree you want to treat or that the product label indicates use on ornamental shade trees in general.

Related Research

```
$(window).on('load', function() { $('ou-exclude-pdf').children().eq(1).attr('href', 'https://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=3166&context=extension_curall'); });
```