



Pest Alert

Box Tree Moth (*Cydalima perspectalis*)

The box tree moth is an invasive pest that primarily feeds on boxwood species (*Buxus* spp). In its native range, it also feeds on burning bush (*Euonymus alatus*), Japanese spindletree (*E. japonicus*), purple holly (*Ilex chinensis*), and orange jessamine (*Murraya paniculate*) once boxwood in the vicinity are completely defoliated.

Distribution and Spread

The box tree moth is native to temperate and subtropical regions in Asia. It was first reported in Europe in 2007, after which it spread rapidly across European countries and into Western Asia and Northern Africa. In 2018, it was documented in Canada. The rate of spread for the box tree moth has varied since its introduction in Europe, with some cases peaking at 96 miles per year. Long distance movement of the box tree moth across Europe occurred primarily through the movement of infested boxwood plantings.

Box tree moths are highly mobile and are good fliers. Natural spread of this moth in Europe is about 3 to 6 miles per year. One analysis from Europe concluded that natural dispersal from continental Europe to the United Kingdom was possible, suggesting sustained adult flights of over 20 miles.

Damage

In 2014, boxwood made up 15 percent of broadleaf evergreen sales in the United States, and the estimated value was \$126 million (USDA-NASS, 2015). Boxwoods are typically planted as ornamentals



Adult moths (top and bottom left), damage (bottom)

and used for edging, as hedges, and/or clipped into different shapes to make topiaries. The box tree moth can cause heavy defoliation of boxwood plants if populations are left unchecked. Defoliation of existing and new growth can kill the plant. If no foliage is available, larvae have been observed feeding on the bark, which can cause branches or the entire plant to die.

Description

Adult box tree moths generally have white bodies with a brown head and abdomen. Their wings are white and slightly iridescent, with an irregular

thick brown border spanning 1.6 to 1.8 inches. Some adults have completely brown wings with a small white streak on each forewing. Males and females show both colorations.

The eggs are pale yellow and average 0.04 inches in size. They are laid in flat clusters of about 5 to 20 on the underside of boxwood leaves. As they mature, a black spot appears marking the larval head.

Newly hatched larvae have black heads and are green to yellow in color. As they age, dark brown stripes develop on the body. The most mature larvae are about 1.6 inches

long and have thin white and thick black stripes and black dots outlined in white along the length of the body.

Pupae develop inside a silk cocoon and are 0.6 to 0.8 inches long. They are initially green, with black stripes on the back, and turn brown as they mature.

Life Cycle

Adult female box tree moths lay their eggs singly or in clusters of about 5 to 20 in a gelatinous mass on the underside of boxwood leaves. Box tree moths overwinter as larvae. Once temperatures rise, overwintering larvae emerge and typically begin feeding in March, continuing until they pupate in late April to early May. As they develop, they spin silken webs to hold leaves together and create protected areas to feed. They tend to feed on leaves in the lower portion of host plants but reside in the upper portion and remain active until September or October.

Pupation occurs on the host leaves in silk cocoons. If the boxwood host is defoliated, pupation may occur away from the host plant using leaves from the surrounding area. Pupae will typically first appear in April or May and will be present continuously through the summer and into the fall, depending on the local climate and timing of generations.

Adults first emerge from the overwintering generation between April and July, depending on climate and temperature. Subsequent generations are active between June and October. Adults typically live for 2 weeks after emergence.



Egg mass (top), pupa (bottom left), caterpillars (bottom right)

Where To Look

Signs of damage may not appear at the beginning of an infestation because young larvae hide among twigs and leaves. Larvae skeletonize the leaves and feed on the bark, causing defoliation and dryness, leading to the plant's death. Signs of feeding include green-black frass (excrement) and webbing.

The female moths lay their eggs on the underside of the leaves of boxwoods.

Report Your Findings

If you find an insect that you suspect is the box tree moth in Massachusetts, please take photos and submit an online report here: www.massnrc.org/pests/report.aspx

Nurseries growing or selling boxwood shrubs may also contact UMass Extension: ag@cns.umass.edu

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Credits: Light-colored adult moth, caterpillar, and damage photos courtesy of Matteo Maspero and Andrea Tantardini, Centro MiRT - Fondazione Minoprio [IT]. Egg mass photo courtesy of Walter Schön, www.schmetterling-raupe.de/art/perspectalis.htm. Pupa photo courtesy of Ilya Mityushev, Department of Plant Protection of the Russian State Agrarian University - Moscow Timiryazev Agricultural Academy. Dark brown adult moth courtesy of Colette Walter, www.lepiforum.de/webbbs/images/forum_2/pic13983.jpg.