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Fall Webworm

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Introduction

The fall webworm (*Hyphantria cunea* (Drury)) is a common insect pest native to North America that can garner a lot of attention due its construction of unsightly webs (Fig. 1). Fall webworms are found throughout much of the United States and even in parts of southern Canada. At least 100 species of trees are known to be attacked by the fall webworm, but primary targets include ornamental, shade, fruit, and nut trees (McCullough and Siegert 1999). Fall webworms are also somewhat unique because they are one of a relatively few insect pests native to North American that have become a problematic invasive in another country. It was introduced to Europe around 1940, and it now feeds on more than 200 species of plants there. The fall webworm is also present in Asia where upwards of 300 plant species are susceptible to attack (McCullough and Siegert 1999).

Biology

Fall webworm caterpillars (larvae) most commonly range in color from light green to yellow, with head colors varying between black and red (Fig 2). Tufts of long black and white hairs are present on larvae and arise from small-wart like projections (tubercles) on the body. These projections are colored to match the head. Adults reach approximately 1-inch in length at maturity (McCullough and Siegert 1999).

Upon hatching, webworm larvae immediately begin to spin webs where they live in colonies. The web is constructed to act similar to a greenhouse, providing high humidity which increases larvae survivability and growth rates (Allen 1993). Larvae feed on leaves within the web, leaving the midrib and major leaf veins (Fig. 3). As webworms grow, their web also increases in size. When colonies of webworms are disturbed, they may make sudden synchronized jerking movements to ward away potential predators. Webworms will undergo up to 10 molts before they eventually leave the web to overwinter on the ground or within tree bark (McCullough and Siegert 1999).

Webworms overwinter as pupae which are brown, cylindrical, and about 5/8 of an inch long (Fig. 4). Pupae are enclosed in a thin, white felt-like cocoon and eventually hatch into moths the following spring. Moths are white in color, sometimes with dark markings on the wings (Fig 4). They are approximately 5/8 of an inch long with a wingspan of 1 – 1.5 inches and are commonly referred to as tiger moths (Klass 2012). The primary goal of the moth is to mate and lay eggs (Ree and Robinson 1999). These pale green eggs are laid in flat masses on the bottom of leaves and covered with hair from the abdomen of the female (Fig. 5). Eggs hatch in about a week and larvae immediately begin building their signature webs (Klass 2012).

There can be one to four generations of fall webworm, depending on the location and conditions. In northern states and Canada, only one generation may be produced each year (McCullough and Siegert 1999). The long growing season in southeastern states commonly harbors multiple generations. The first generation may arise as early as April, with generations persisting until the fall. The fall generation is the most threatening (Ree and Robinson 1999).

Signs and Symptoms

Fall webworms are most notable for the large webs they produce during late summer and fall (Fig. 1). These webs may span 4-6 feet, covering

entire branches of trees. In cases of severe infestations, the entire tree may be covered in webs (Ree and Robinson 1999). Since consumed leaves have already provided the bulk of their photosynthetic functions to the tree by this time of year, fall webworms pose little direct threat to trees (Klass 2012). Repeated infestations over the span of years may degrade tree health and predispose it to potential fatal factors such as drought, disease, or other insect pests (Ree and Robinson 1999). However, these localized repeat infestations are rare. The main implication from fall webworms is aesthetic, the very unsightly appearance of webs containing cast skins, fecal pellets, and dead leaves (McCullough and Siegert 1999). Webs are sometimes mistaken as eastern tent caterpillar webs, but eastern tent caterpillars construct their webs during the early spring around the time of leaf budding in the crotches of branches (Allen 1993).

Susceptibility

Fall webworms are known to attack more than 200 species of plants, including over 100 species of trees. They most commonly attack ornamental, nut, and fruit trees, while avoiding conifers such as pine and cedar (Allen 1993). Common species infested by fall webworms in the southeastern U.S. include pecan, hickory, elm, and oak (Ree and Robinson 1999). Webworms prefer trees that receive lots of sunlight, thus are more prevalent among trees in or near open areas such as fields, yards and road sides (Klass 2012).

Control

In most cases, fall webworm is just an unsightly annoyance, and control measures are usually unnecessary. However, in certain extreme instances, infestations can be severe enough to warrant intervention. Most trees have some level resistance to defoliation, but the degree to which they are resistant varies by species. Most otherwise healthy and vigorously growing hardwood trees will not die from a single total defoliation. In severe infestations where trees are completely defoliated each year (consecutively) or more than one time per year, the situation may start to warrant control to protect the life of the tree. Maintaining tree vigor through regular watering fertilization, and avoiding root compaction will minimize ill effects from the fall webworm and many other tree pests.

Control of fall webworms may be accomplished by destroying leaves containing egg masses, pruning webs off branches and burning and disposing of them, or even giving webs a strong blast from a water hose (McCullough and Siegert 1999). Insecticides can also be used, but should be reserved for cases of extreme infestation or where webs are too high in a tree for easy removal. It is best to apply insecticides when webworms are small, and the chemical needs to reach the inside of the web for maximum effectiveness (Ree and Robinson 1999). Webworms can normally be controlled with just one or two insecticide applications. If the first application is not entirely successful, the second round of insecticides should be applied a week later (Klass 2012). Numerous insecticides are effective against fall webworm, but the bacterial insecticide Bt (*Bacillus thuringiensis*) is recommended as it doesn't affect non-foliage feeding species of insects. Use of insecticides other than Bt can harm beneficial species of insects, some of which even help regulate fall webworm populations. High populations of webworms can serve as a major food source for enemies, which include at least 50 species of parasitic insects, 30 or more species of predatory insects, and other non-insect predators such as small mammals and birds (McCullough and Siegert 1999).

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Figure 1: Web of the fall webworm (Hyphantria cunea (Drury)), with dead leaves visible. Photograph by: Ronald F. Billings, Texas Forest Service, www.forestryimages.org.

Figure 2: Fall webworm caterpillar (larvae). Photograph by: James B. Hanson, USDA Forest Service, www.forestryimages.org.

Figure 3: Leaves damaged by fall webworms, take notice of the remaining veins. Photograph by: James Castner, University of Florida, http://entnemdept.ufl.edu/creatures/trees/moths/fall_webworm.htm.

Figure 4: Fall webworm after pupation (tiger moth) and fall webworm pupae. Photograph by Gerald J. Lenhard, Louisiana State University, www.forestryimages.org.

Figure 5: Fall webworm egg mass on underside of leaf. Photograph by: Pennsylvania Department of Conservation and Natural Resources - Forestry Archive, www.forestryimages.org.