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Fall Webworm in Arizona

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Fall webworms are caterpillars that commonly defoliate many broadleaf deciduous trees, such as cottonwood (*Populus* spp.), walnut (*Juglans* spp.), alder (*Alnus* spp.), chokecherry (*Prunus* spp.) and elderberry (*Sambucus* spp.). They also attack fruit, nut and ornamental shade trees and shrubs, including pecan (*Carya* spp.) and mulberry (*Morus* spp). Fall webworms are native to North America and are present throughout the country. Fall webworms are the species *Hyphantria cunea* (Family Arctiidae), of which the red-headed race is most common in Arizona. Activity in the state has appeared to increase in recent years, both in geography and host species.

This insect's most obvious sign is the caterpillars' communal silken web that can be seen at the ends of the branches during late summer and fall. Female adults lay eggs on leaves during the summer months, so defoliation by the caterpillars is most conspicuous in fall. Damage does not usually cause serious stress to trees. Treatment is not typically prescribed, especially in natural settings.

High population effects

The effects of fall webworms are most pronounced in autumn months, when populations of second generation moths have generated multiple webs on many trees in forested areas, so much so that entire trees and shrubs will appear to have been defoliated. While the webs and defoliation may cause a loss of visual quality for some people, entomologists recognize that damage to host's health is typically minor as defoliation occurs in the late summer and fall. This is true for fruit and ornamental trees as well. The host plant has already had an opportunity to store a majority of its energy reserves for the winter season, and autumn leaf fall is imminent in any case.

In some cases large patches of trees and forested areas can be defoliated, and defoliation may occur several years in a row, but most trees survive the loss of foliage. Even heavy defoliation is rarely fatal. Trees that are stressed by disease or drought may be more susceptible to mortality.

Description

The adult moth is white and has a wingspan of 1 to 1 ½ inches, but may also exhibit variations of dark spots occurring on the forewings (Figure 1). The legs and body may have orange

Figure 1. Adult moths of the fall webworm vary in coloration from white to spotted. Photo credit: John Pickering, discoverlife.org.

Figure 2. Typical orange under markings of the legs and body. Photo credit: John Pickering, discoverlife.org

Figure 3. Light colored variation of the fall webworm larvae. Photo credit: Clemson University - USDA Cooperative Extension Slide Series, forestryimages.org.

Figure 4. Gray colored variation of the fall webworm larvae. Photo credit: James B. Hanson, USDA Forest Service, forestryimages.org.

Figure 5. Green color variation of the fall webworm larvae. Photo credit: James B. Hanson, USDA Forest Service, forestryimages.org.

markings (Figure 2). Typical larvae have a dark head, yellowish/greenish body, with a dark stripe on the back, and tufts of long white hairs sticking up from reddish orange or black tubercles (bumps); although larval coloration may be variable (Figures 3, 4, 5 and 6). Full grown larvae are about 1 to 1 ¼ inch long. Pupae are brown, about 5/8 inch long, and covered in a thin felt-like cocoon (Figure 7).

Life cycle

Adult moths emerge in late spring and throughout the summer months. Under favorable conditions, the life cycle from egg to adult is approximately 50 days. If the growing season is long enough, two or more generations may occur. Adults are nocturnal and attracted to light, which might explain the common occurrence of roadside infestations. They mate and each female lays one "hairy" looking mass of 100-600 eggs on the underside of leaves near the ends of branches (Figure 8). Eggs hatch in one to two weeks. The larvae immediately begin to create a communal silken web under which they feed and are protected from predators.

The larvae molt multiple times (six to eleven molts have been recorded) to maturity in around six weeks (Figures 9 and 10). During this time they remain under the protective web which they continue to expand, covering up to two to three feet of the branch (Figures 11, 12 and 13). They skeletonize the leaves they feed on, leaving behind veins and leaf ribs. Older larvae may consume entire leaves. Once mature, larvae leave the web and either crawl down the trunk or drop to the ground to pupate. When in large numbers, larvae may disperse and migrate and be considered a nuisance as people encounter them. Overwintering pupae are found in soil litter, under soil, and in crevices found in tree bark and rocks.

Controlling outbreaks

Because of the late season occurrence of defoliation and the many natural predators and diseases that take advantage of this native species, treatment is typically not necessary.

Given time, nuisance level populations will decrease due to natural causes. Fall webworm caterpillars are attacked by parasites, spiders, wasps and other insect predators, and bacterial and viral diseases. Several species of songbirds and some bats and small mammals eat the eggs, larvae and/or moths. While vertebrate predators are important population regulators under normal population conditions, their capacity to affect fall webworm populations can be overwhelmed during heavy infestations.

In small landscape settings and for smaller trees, accessible branches with webs may be pruned out by hand or pole, especially during the summer months before the webs are fully developed. This practice requires an attentive eye. Webs can be destroyed by soaking them thoroughly in a large tub of soapy water (approximately 1 tablespoon of liquid soap per gallon of water). Pruning of heavily infested plants late in the season is not recommended, especially when more than one-quarter or one-third of the branches may be removed. In these cases, pruning is

Figure 6. Black color variation of the fall webworm larvae. Photo credit: Lacy L. Hyche, Auburn University, forestryimages.org.

Figure 7. Pupae are brown, about 5/8 inch long, and covered in a thin felt-like cocoon. Photo credit: Ministry of Agriculture and Regional Development Archive, Ministry of Agriculture and Regional Development, Hungary, forestryimages.org.

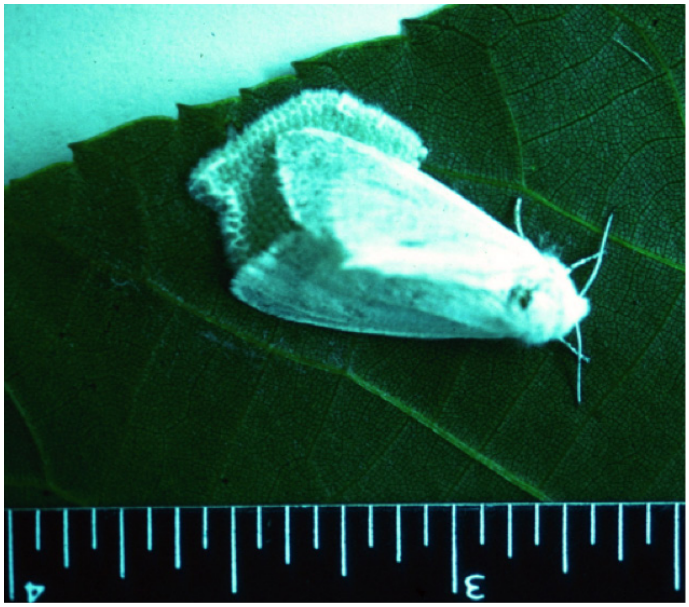

Figure 8. Typical egg mass of the fall webworm. Photo credit: James B. Hanson, USDA Forest Service, forestryimages.org.

Figures 9 and 10. Small instar larvae and early phase "web" of the fall webworm, when the colony consists of small young caterpillars and the web is small. This stage is most susceptible to treatment. Photo credit: Lacy L. Hyche, Auburn University, forestryimages.org.

Figure 11. Multiple colonies of webworm feeding on pecan. Photo credit: Lacy L. Hyche, Auburn University, forestryimages.org.

Figure 12. Typical webbing of the fall webworm. Photo credit: James B. Hanson, USDA Forest Service, forestryimages.org.

Figure 13. The "web" of the fall webworm can be over two feet in length. Photo credit: Whitney Cranshaw, Colorado State University, forestryimages.org.

more stressful to the plant than webworm defoliation. Larvae can be exposed to parasites and predators by tearing the webs open with a long pole with a hook or claw at the end. Removal of egg masses may be impractical except for the most highly motivated homeowners with small specimen trees.

As a precaution, care should be taken to avoid direct skin contact with the caterpillars themselves, as some people may develop a rash or hives if they are allergic or sensitive to the haired tufts. A broad brimmed hat, gloves and long sleeved shirt can be worn to minimize contact.

For orchard infestations and locations where visual quality is highly valued, *Bacillus thuringiensis* (Bt), spinosad, and other labeled botanical or synthetic insecticides may be used and are effective against fall webworms especially when applied while the larvae (and therefore the web too) are small. Formulations with UV protectants are recommended. Thoroughly treat the leaves next to the web. As these leaves are incorporated into the web and eaten, the insecticide will be consumed. High pressure sprayers are used to reach the upper portions of tall trees. Always follow pesticide label directions. Late season insecticidal treatments are not recommended.

Bt is a naturally occurring bacterial organism that kills the larvae of moths and butterflies, as well as other target insect families. Spinosad is also effective against flea beetles and thrips in addition to caterpillars. Both are available as insecticides under different brand names. Consumers should read labels thoroughly to assure the formulation is appropriate to their target pest. Spinosad can be toxic to pollinators and can kill honey bees if they come in contact with treated surfaces on the same day of application. As a safe use guideline, spinosad in particular should be applied during evening hours when bees are not around to reduce environmental impacts (Majumdar et al 2013).

If treatment is necessary over multiple seasons, consult with a certified pesticide applicator to discuss an integrated pest management plan (IPM), as repeated annual reoccurrence may indicate an underlying problem that can be solved without insecticides. Even in events where large populations are hard to control, the use of insecticides is not necessarily more effective than natural causes (predators and disease) and the use of pruning and mechanical control mentioned above.

Other considerations

In many parts of Arizona, tent caterpillars (*Malacosoma* spp.) are also present. They attack many of the same tree species as the fall webworm. While these caterpillars create similar webs or tents, they tend to be in the branch crotches rather than at the ends, and they are active and visible in the spring.

Resources

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