

Insect Defoliators of Missouri Trees: Colony Feeders

Division of Plant Sciences

All parts of a tree are susceptible to insect attack; there are leaf feeders, sap feeders, and bud, twig, branch and stem borers. The most noticeable type of tree injury is foliage consumption. Most trees can survive a partial to complete defoliation for several years, especially if the trees are vigorous and growing in good sites. However, defoliation at a critical time during the growing season can weaken a tree, making it susceptible to secondary pests and diseases.

While many species of caterpillars feed on the foliage of shade, ornamental and forest trees, a significant number of the more common pests exhibit colony feeding behavior — the larvae feed as a group on foliage. This gregarious feeding behavior usually lasts until the larvae are full-grown, when they go their separate ways to feed before pupation.

Some of the common “colony feeding” pests of Missouri’s hardwood trees are the walnut caterpillar, yellownecked caterpillar, and catalpa sphinx.

Walnut caterpillar (*Datana integerrima*)

Hosts. The walnut caterpillar is found throughout most of the eastern United States. It occurs as far west as Nebraska and as far south as Texas. In northern states there is one generation per year; two generations appear annually in southern states.

Host plants include a variety of deciduous trees, but a distinct preference is shown for walnut, butternut, pecan, and hickory. Trees that are isolated or in small groups are especially susceptible to serious injury. Three or more successive years of heavy defoliation are likely to kill the tree.

Biology. The adult moth is about 0.75 to 1 inch long and about 1 inch wide when the wings are at rest. The forewings are tan-brown and traversed with four



Colony of walnut caterpillar larvae in their black phase.

dark brown lines.

In late spring and early summer, the adults emerge from the soil, where they overwintered in the pupal stage. Eggs are laid in masses of 300 or more on the underside of leaves. The egg clusters are pale green to light blue-gray in color.

Newly hatched larvae (first instar) are leaf skeletonizers, light yellow-green in color and about 0.25 inch long. Second- through fourth-instar larvae are dark red with four longitudinal white stripes on each side of the body. They are 0.5 to 1.5 inches long and consume the entire leaf except the petiole. The larvae move and feed in colonies until the last larval stage. The colony will also move in mass to the trunk or a large limb of the tree to molt (shed their skins), leaving an unsightly “hairball” of shed skins. The colony then returns to the foliage and continues feeding.

When disturbed, a larva arches its head and tail, as though fighting off a predator. The full-grown larva (fifth instar) is about 2 inches long, has a dark, black body with long, whitish-gray hairs, and feeds singly. Soon after reaching the last instar, the larva drops to the ground and searches for a protective site to pupate, often in the ground and usually near the host tree.

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Yellownecked caterpillar (*Datana ministra*)

Hosts. The yellownecked caterpillar is widely distributed throughout the United States and feeds on the foliage of many shade, fruit and forest trees. Recorded host plants include birch, elm, maple, walnut, oak, honeylocust, hickory, sumac, crabapple, cherry, quince and almond. Infested trees can be completely defoliated by mid to late summer. Serious injury occurs primarily in single, isolated trees. Defoliation appears first on the canopy periphery.

Biology. The adult moth is similar in size and color to the walnut caterpillar adult. During midsummer the adults emerge from the soil where they overwintered as pupae. Eggs are laid in masses of about 25 to 100 eggs on the underside of leaves.

The newly hatched larvae are leaf skeletonizers. Older larvae consume the entire leaf except the petiole. Full-grown larvae are about 2 inches long and moderately hairy. The head is black; the prothorax or “neck” region is bright yellow-orange, and the body has alternating longitudinal black and yellow or white stripes.

As with the walnut caterpillar, a yellownecked caterpillar will lift its head and tail above the rest of its body when disturbed. Mature larvae will drop to the ground and pupate 0.5 to 4 inches beneath the soil. There is one generation per year.

Catalpa sphinx (*Ceratonia catalpae*)

Host. The catalpa sphinx caterpillar occurs primarily in the southeastern United States but can be found as far west as Colorado and as far north as Michigan. Apparently its only host plant is the catalpa tree. Since the early 1800s, fishing partisans often have used these larvae as bait and have cultivated the catalpa for no other purpose than to attract the insect.

Biology. Adults are brownish-gray and have irregular dark and light colored lines across the forewings; wing expanse is up to 3 inches. The adult is a type of “hawk moth” and resembles the adult moth of the tobacco and tomato hornworm.

In the spring, the adults emerge from the soil where they overwintered as pupae. Eggs can be laid in

masses of several hundred on the underside of leaves or in smaller masses on twigs and branches.

Younger larvae are pale yellow. The group feeding behavior of the larvae continues until the later instar stages, when they feed singly before moving to the ground seeking a pupation site.

Full-grown larvae are about 2 to 3 inches long and possess a stout black horn near the rear of the body. They vary in color from pale yellow with green markings to black with yellow markings. In Missouri, the common color pattern of mature larvae is a black head; the top portion of the body black; sides of the body yellow with small black markings; and a black line running the length of the body, separating the yellow sides from the light-colored underside. Depending on the geographic location, there can be up to four generations of catalpa sphinx each year.

Control

On small trees, the best nonchemical control for these gregarious caterpillar species is to search the foliage for egg masses and tips of branches for colonies of larvae, then prune and destroy the infested leaves or twigs. This should be done early in the summer when populations are usually low since the initial infestations are found primarily on the lower branches.

A control technique that may be helpful is to till the ground thoroughly (if appropriate) in the immediate vicinity of the trunk in the fall. This will destroy some of the overwintering pupae.

The walnut and yellownecked caterpillars and the catalpa sphinx are all attacked by a number of invertebrate and vertebrate natural enemies, reportedly providing a fairly high level of natural control under most circumstances. This natural mortality coupled with an early-season examination of the trees usually provides sufficient control.

For larger trees where it is impractical to search the foliage, chemical control may be required. Chemical applications should be made as soon as groups of larvae appear. Some insecticides that can provide control for these colony feeders are certain formulations of carbaryl, cyfluthrin, acephate, neem and *Bacillus thuringiensis* (Bt).

Note: All chemical information is presented with the understanding that no endorsement of named products is intended, nor is criticism implied of similar products that are not mentioned.