

# Identification and Management of Orange-striped Oakworm

by

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In late summer, most of us like to be outside, enjoying the last warm days before fall sets in. If you have oak trees in your yard or live near large areas of oak forest, however, you may have an unwelcome companion - the orange-striped oakworm (*Anisota senatoria* [J.E. Smith]; Lepidoptera: Saturniidae). The orange-striped oakworm is a caterpillar that feeds on the leaves of oak trees in late summer and early autumn. This insect is native to North America and occurs from Wisconsin and southern lower Michigan east to New England and southeastern Canada. It is also found in Georgia, Virginia and Kansas, but it is more abundant in northern regions. When outbreaks occur, orange-striped oakworms can severely defoliate forest and shade trees. Older caterpillars produce large pellets of frass (fecal pellets) in great abundance. Caterpillars often wander about, searching for more leaves, and may congregate on sidewalks or the sides of houses. High populations of orange-striped oakworm can be distasteful and annoying to residents in suburban, rural and recreational areas. Accurate identification of orange-striped oakworm and an understanding of its biology will help you learn to recognize and manage this insect in your yard.

## Identification

Orange-striped oakworm caterpillars are distinctive and simple to identify. Young caterpillars are greenish yellow with eight orange stripes that run the length of their bodies. As the caterpillars grow, they become black and the orange stripes become more evident (Fig. 1). The caterpillars have two characteristic black, hornlike projections just behind the head (Fig. 2). Caterpillars rapidly increase in size and may grow to 3 inches in length by the time they finish feeding. Adult moths have bright orange-yellow

bodies. The forewings have many dark spots and a single, distinct white spot near the edges (Fig. 3).

## Life History

The orange-striped oakworm has one generation per year in northern North America and two generations per year in southern states. Adult moths may be present from late June to early August. Individual moths can live for about a month. During that time, a female moth deposits up to 500 eggs, usually in a cluster on the underside of an oak leaf (Fig. 3). The eggs hatch in 7 to 10 days and the small caterpillars begin feeding in groups. These young caterpillars skeletonize the leaves, consuming the soft tissue and leaving the veins intact. As the caterpillars mature, they feed in small groups or alone and consume more of the leaf tissue. Large caterpillars leave only the main midrib of the leaf untouched (Fig. 4). When they are fully grown and complete their feeding, the caterpillars crawl to the ground and tunnel a few inches into the soil. Each caterpillar forms an earthen cell and pupates. Pupae remain in the soil until the following summer, when the adults emerge from the earthen cells and burrow up to the soil surface.

## Impact of Orange-striped Oakworm on Trees

The orange-striped oakworm is one of the most common "fall defoliators," insects that feed on oak leaves in late summer and early autumn. Though oaks are the preferred hosts, orange-striped oakworm may occasionally feed on birch, hazelnut, hickory and maple trees.



Figure 1. A large orange-striped oakworm caterpillar.



Figure 2. In addition to their distinctive orange stripes, these caterpillars have a pair of small, black, flexible "horns" just behind the head.



Figure 3. An orange-striped oakworm adult moth and the eggs that she just laid on an oak leaf.

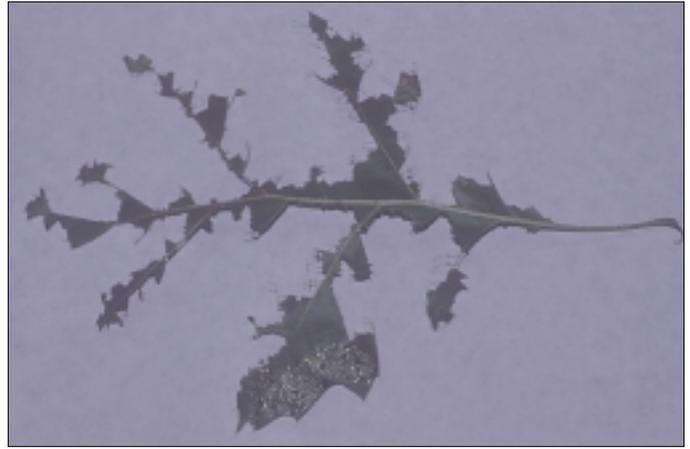


Figure 4. Orange-striped oakworm caterpillars consume nearly all the foliage on oak leaves, leaving only the main veins of the leaves intact. Note the eggs on the leaf that have already hatched.

The good news about the orange-striped oakworm and other fall defoliators is that their feeding rarely affects tree health. By late summer, when orange-striped oakworm caterpillars begin feeding, trees have completed most of their photosynthesis and are preparing for winter dormancy. Therefore, defoliation in late summer is less stressful to trees than defoliation earlier in the summer caused by other pests such as forest tent caterpillar and gypsy moth.

Generally, orange-striped oakworm defoliation poses a problem only when trees were previously stressed by other environmental factors. These factors may include defoliation by gypsy moth or other insects, severe drought, disease, or poor site conditions such as compacted soil along a street or sidewalk. Repeated stress can reduce the energy reserves in a tree and lower its ability to tolerate even late summer defoliation.

## Management

The second piece of good news about the orange-striped oakworm is that, because this insect is native to North America, it has a well established complex of natural enemies. These natural enemies include diseases and other insects that are predators or parasitoids of orange-striped oakworm. In oak forests in the Great Lakes states, most orange-striped oakworm outbreaks last 2 to 4 years in a given area. The natural enemies eventually build up and reduce the orange-striped oakworm population to tolerable levels that cause little damage.

Residents living in areas experiencing orange-striped oakworm outbreaks do have options for protecting shade and ornamental trees and reducing the nuisance that orange-striped oakworm caterpillars can cause. Some residents may choose to do nothing and allow natural enemies to eventually control the orange-striped oakworm population. On small oak trees, you may wish

to check the underside of leaves for eggs early in the summer. Leaves with eggs can be clipped off and destroyed.

Another option is to wait until eggs hatch, then spray the foliage of oak trees with B.t. (*Bacillus thuringiensis* var. *kurstaki*). B.t. affects only foliage-feeding caterpillars and will not harm beneficial insects such as predators and parasitoids. It is used widely in Michigan for gypsy moth control and does not affect people or other animals such as birds and fish. To be effective, however, B.t. must be applied when caterpillars are small. Spraying 1 to 2 weeks after eggs hatch will prevent most defoliation from occurring.

Conventional broad-spectrum insecticides can also be used to control orange-striped oakworm caterpillars. These products, however, will kill a wide range of insects. In addition, applying broad-spectrum insecticides when large caterpillars are feeding might affect the insect predators and parasitoids of orange-striped oakworm, perhaps prolonging the outbreak in a localized area. Both B.t. and many conventional insecticides will be effective only if applied directly to the foliage where the orange-striped oakworm caterpillars are feeding. If large oak trees are infested, it may be difficult to get adequate amounts of the insecticide into the upper canopy.

Regardless of the option you select, it is always a good idea to keep your oak trees healthy. Avoid wounding trees with lawn equipment and avoid compacting the soil around the base and under the tree canopy. Make an effort to water trees in your yard during dry periods, especially if trees are affected by defoliators or other stress factors. It's a good idea to place a hose out by the dripline of the tree and allow the water to run slowly for several hours once a week when conditions are warm and dry. Or, apply 1 inch of irrigation per week through a sprinkler. Set out a few cups or cans to measure the amount of water that is applied. Maintaining tree health will help your trees tolerate and recover from even severe orange-striped oakworm defoliation.



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