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GARDEN FACTS
University of Wisconsin–Extension
Gypsy moth

Gypsy Moth

R. Chris Williamson

Gypsy moth larva

The gypsy moth is native to Europe, Asia and North Africa. It was inadvertently introduced into North America in 1869 in a misguided attempt to breed a hardy silkworm. The gypsy moth is now the most virulent insect pest of forest and shade trees in the eastern United States.

The gypsy moth is at its most destructive in the caterpillar stage, stripping entire trees and forests of their leaves. Severe defoliation often weakens trees, leaving them susceptible to other stresses such as drought, disease and insects.

Gypsy moth caterpillars can also pose nuisance problems to humans because they typically aggregate on the sides of buildings and homes, and produce large quantities of frass (fecal pellets), that fall from trees onto lawns and patios. Also, some people may experience an allergic reaction if they come into contact with the many hairs covering the body of caterpillars.

Plants attacked and damage caused

Gypsy moth caterpillars feed on more than 600 species of trees and shrubs. Most preferred hosts include aspens, birches, crabapples, hawthorns, lindens, mountain ash, oaks, sweetgums and willows. Some trees, such as dogwood, green ash, honeylocust, silver maple, red maple, tulip tree and white ash are resistant. Typically, most evergreen trees are also resistant, though blue spruce and white pine are susceptible. Feeding damage caused by gypsy moths frequently produces severe or complete defoliation, decreasing the energy reserves of the tree. However, trees that are defoliated by gypsy moth rarely die; they often produce new leaves in July.

Life cycle

The gypsy moth has four distinct developmental stages: 1) egg; 2) larva or caterpillar; 3) pupa; and 4) adult. In each stage, the gypsy moth looks and behaves very differently.

Adult females lay eggs in masses of up to 1,000 or more in August. These masses are frequently attached to houses, lawn furni-

ture, mailboxes, rocks, trees or most any other available object. Often, the egg masses are well-hidden. Approximately one month after the eggs are laid, the tiny larvae are fully formed and ready to hatch. However, at this point, they go into an overwintering diapause, shutting down metabolic activities and becoming considerably less responsive to temperature. The larva stays inside the egg over the winter. In early spring, as temperatures increase, the larva slowly becomes more active, and in mid-May, as the leaves are expanding, it hatches.

Newly hatched caterpillars climb into tree canopies and begin feeding. If the first tree lacks foliage, the caterpillars produce silken threads whereby they disperse to a new host in a process known as ballooning. After the larvae have completed ballooning, they begin feeding, continuing throughout the spring months for approximately five to six weeks.

About once a week the larva will grow too large for its exoskeleton and will molt. These molts separate the larval period into five or six stages called instars. Early larval instars (one through three), feed during the day. At the time of the fourth instar, larvae begin feeding at night and hide under rough bark or in leaf litter during the day. Approximately 90% of the leaves consumed by larvae are eaten in the last two instars. After they have completed feeding, caterpillars enter the pupal life stage and emerge as adults sometime in July. The adults do not cause damage because they do not eat at this stage and live only long enough to mate and produce eggs.

Control

Successful management of gypsy moths requires an integrated approach that includes several management methods. When population densities are high or when there is an outbreak, the most effective approach for preventing widespread defoliation and reducing the gypsy moth population is an aerial application of a biologically derived insecticide called *Bacillus thuringiensis*, commonly known as Bt. Bt sprays are effective only on young gypsy moth caterpillars (in the first to third instars). They are essentially harmless to invertebrate animals, including birds, fish, humans and pets. However, Bt can also affect other, non-target butterfly and moth species.

Insect growth regulators (IGRs) such as dimilin are viable alternative controls available for both commercial and homeowner use. IGRs mimic insect hormones, and affect only insects. In areas where gypsy moth has been established for a few years, natural controls can help maintain populations below damaging levels. Natural enemies include insect parasites that attack egg and caterpillars, predators such as birds, and disease organisms. A fungal disease of gypsy moth called *Entomophaga maimaiga* is currently being used by researchers, and is providing promising control of gypsy moth.

Homeowners can affect gypsy moth populations on their properties by looking for, removing and destroying egg masses in the fall and winter. In spring, homeowners can wrap bands covered in sticky material around the trunks of trees to entangle caterpillars as they climb up trees. Older larvae can be collected and destroyed daily from under these burlap skirts placed around tree trunks. Such control methods can reduce gypsy moth numbers on isolated trees, but cannot prevent defoliation over wider areas.

For pesticide recommendations, see the Extension publication Woody Ornamentals Pest Management in Wisconsin *(A3597), or contact your county extension agent.*

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