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Ohio State University Extension Fact Sheet

Entomology

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Gypsy Moth in Ohio Landscapes

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What Is the Gypsy Moth?

Gypsy moth is the most important insect pest of forest and shade trees in the eastern United States. The larval or caterpillar stage frequently strips entire trees and even forests of their leaves over wide areas. Severe defoliation can weaken trees, leaving them more susceptible to other stresses, such as drought, disease, and some other, lethal-insect pests such as borers. Trees that are already weakened may be killed.

Gypsy moth can feed on leaves of more than 300 species of trees and shrubs. Favorites include oaks, aspens, birches, lindens, sweetgum, crabapples, hawthorns, mountain ash, and willows.

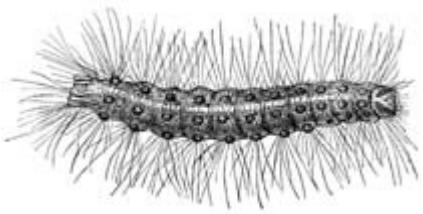
A few trees are resistant, including honeylocust, red maple, silver maple, green ash, white ash, dogwood, and tulip tree. Evergreen trees are generally resistant, but blue spruce and white pine are susceptible to defoliation, especially by larger gypsy moth caterpillars.

Gypsy moth caterpillars can also be a significant nuisance when populations are high. They have a tendency to aggregate on the sides of homes and other structures, as well as produce large quantities of frass (fecal pellets), which fall from tree canopies onto yards and patios below. Some people, especially children, experience an allergic reaction when they contact the many hairs covering the body of caterpillars.

Life Cycle of the Gypsy Moth

The gypsy moth survives the winter as eggs that hatch just as trees begin producing leaves in April or early May. Eggs are laid in masses which can contain up to 1,000 or more eggs. Each adult female produces only

one egg mass which can be attached to trees, rocks, houses, mail boxes, lawn furniture, and just about any other convenient object. Many egg masses are well hidden, and only a small number of the total present can be found, even with the most thorough search.



Mature Gypsy moth caterpillar

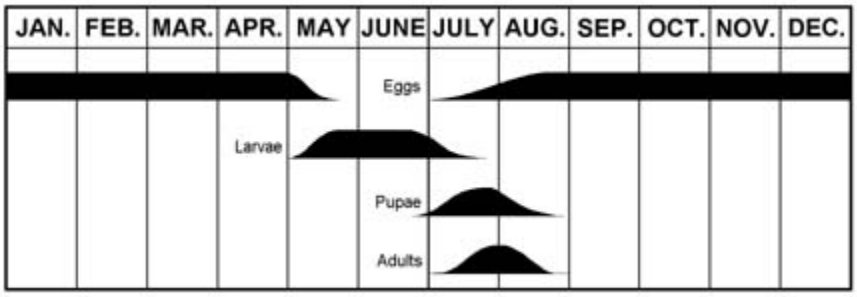
Gypsy moth pupa between two leaves

Newly-hatched caterpillars climb into tree canopies and begin feeding. If their first tree is not to their liking, they will produce a silken thread, which can carry them in the wind, like a balloon, to more suitable hosts. Feeding continues throughout the rest of the spring. As it grows, each caterpillar will consume between 25 and 35 leaves. The vast majority of this feeding is done by older caterpillars during the last two weeks of June, sometimes making it appear as if trees are stripped of leaves practically over night. After they have completed feeding, caterpillars enter the pupal stage from which adult moths emerge in 10 to 14 days.

Gypsy moth male (life size)

Gypsy moth female (life size)

The adult moths are not damaging because they do not feed and they only live long enough to mate and produce eggs. The brownish male moths fly during the day in search of females with which to mate. Whitish females do not fly, but attract males to them by means of a chemical "perfume," or pheromone. Egg masses deposited during mid- to late July will hatch the following spring, completing the life cycle.



Typical time periods for gypsy moth stages in Ohio. Larvae, pupae and adults may be present later in the season if cooler than normal temperatures have occurred in may, June or July.

History of the Gypsy Moth in Ohio

Gypsy moth is a relatively new problem in Ohio. It is native to Europe and Asia, and was introduced into the United States in 1869 when several caterpillars escaped captivity in Boston. It quickly became established in Massachusetts. It can now be found in many parts of the eastern and mid-west United States, and continues to increase its range. The gypsy moth has colonized Ohio on two fronts, spreading from Pennsylvania in the east and from Michigan in the northwest. It is not possible to eradicate the gypsy moth, although programs designed to slow its spread have been successful.

Counties in Ohio that are generally infested with Gypsy moth.

Since adult female moths are not able to fly, "ballooning" by larvae is the chief method of spreading. As a result, natural spread of the population is relatively slow, averaging about 15 miles per year. Unfortunately, gypsy moths are excellent hitchhikers. Egg masses are often attached to cars, campers, lawn furniture, firewood and other objects which, when moved from one place to another, can result in a new infestation.

What Happens When Trees are Defoliated?

Deciduous trees defoliated by gypsy moth are rarely killed. As a rule of thumb, a healthy tree can tolerate three consecutive years of severe defoliation before it is killed. Trees defoliated by gypsy moth will produce new leaves in July after feeding has ended which helps the tree recover. However, defoliation does decrease the energy reserves of the tree, reducing its ability to resist disease and insect pests to which it is normally resistant. Furthermore, defoliated trees are also much more susceptible to the damaging effects of drought. During the summer, trees should receive a combined total of one inch of water per week from rain and irrigation. Trees previously weakened by transplanting, drought, or other insects may be killed by gypsy moth defoliation. Evergreen trees, on the other hand, are frequently killed by one severe defoliation.

Gypsy moths can also have detrimental effects on the ecology of forests. Severe defoliation disrupts the natural cycle of nutrients. It also increases the temperature and amount of sunlight that reaches the forest floor, which can be damaging for shade-adapted wild flowers and other plants. Widespread defoliation can also have negative impacts on wildlife. Defoliation of oak trees decreases acorn production, which is an important food supply for many animals. Many leaf-feeding insects can also starve when gypsy moth strips the forest canopy.

Management of Gypsy Moth

There is no "silver bullet" for dealing with gypsy moth. Successful management requires an integrated approach based on a number of techniques. When population densities are high, the safest and most effective tool for preventing widespread defoliation is aerial applications of an insecticide derived from the naturally-occurring bacterium, Bacillus thuringiensis, commonly know as BT. The BT sprays used for gypsy moth affect only caterpillars, and are completely harmless to all other animals, including bees and other insects, birds, pets, and humans.

In regions where gypsy moth has been established for a number of years, natural controls help keep populations in check during most years. Natural enemies include insect parasites that attack egg and caterpillar stages, predators such as birds, and disease organisms. Gypsy moth is especially susceptible to a virus that is often responsible for the crash of high populations. A fungal disease of gypsy moth called Entomophaga maimaiga has recently has been introduced into Ohio and it is a promising tool for gypsy moth management.

Homeowners can help by searching for and disposing of egg masses on their property. During the day, many caterpillars can be lured to hide under a piece of burlap cloth suspended as a "skirt" over a string tied around the trunk of a tree. These caterpillars can be collected by day and destroyed before they return to the canopy to feed at night. This is also an effective technique for detecting the caterpillars in a tree before severe feeding damage becomes obvious.
