

FORESTRY

Authors: DNR Forest Health Program

The forest tent caterpillar, *Malacosoma disstria*, is a native defoliator of a wide variety of hardwood trees and shrubs and can be found throughout the range of all hardwood forests in North America. The caterpillars are often mistakenly called armyworms due to the way they move in large groups. Caterpillars feed primarily on aspen, birch, basswood, and oak.

Life Cycle and Identification



egg mass and larvae

Forest tent caterpillars hatch from egg masses in early to mid-May when aspen leaves begin to open. They feed on aspen and many other deciduous trees for five to six weeks. Despite their common name, forest tent caterpillars do not make tents, but create inconspicuous silken mats on tree trunks and branches where caterpillars cluster to rest. As the caterpillars grow they consume increasing amounts of leaves, and will wander widely in search of more food. Considerable damage to foliage can occur on host trees as well as nearby vegetation. While defoliation generally does not result in tree death, it weakens trees and makes them vulnerable to disease and other insects that may eventually kill the tree.



forest tent caterpillar

Mature caterpillars are hairy and velvety-black with blue stripes on their sides. A row of yellow keyhole-shaped markings runs along the top of the body. By mid-June, full-grown caterpillars wander from trees where they have been feeding to find sheltered places to form pupae inside silken cocoons.

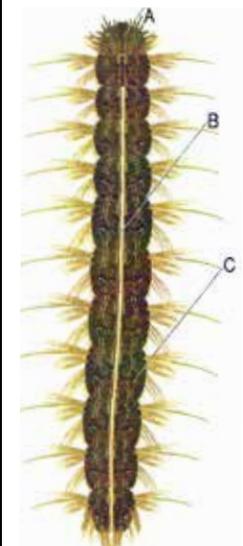
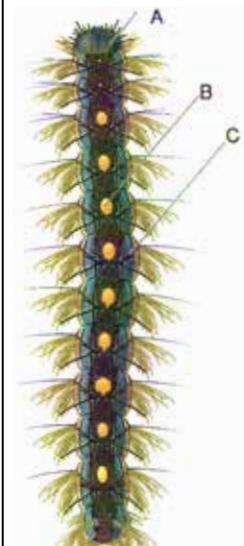
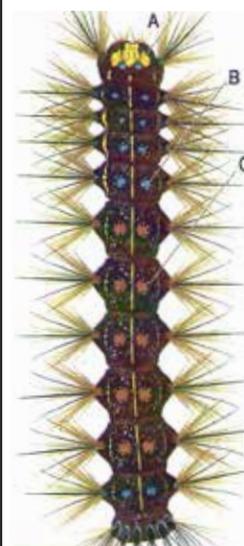
Adult moths emerge from cocoons 10 days to two weeks after pupae are formed. The yellowish-brown adults fly at night and are attracted to lights in large numbers. They may be carried for miles by strong winds. Females deposit eggs mainly on upper crown branches in masses of 100 to 350 that encircle small twigs. Eggs are coated with a frothy, glue-like substance that hardens and turns a glossy dark brown. The eggs overwinter, and larvae hatch the following spring.



adult moth

Look-alikes

There are many types of caterpillars that can be mistaken for forest tent caterpillar. The following information will help to identify which is feeding on your trees.

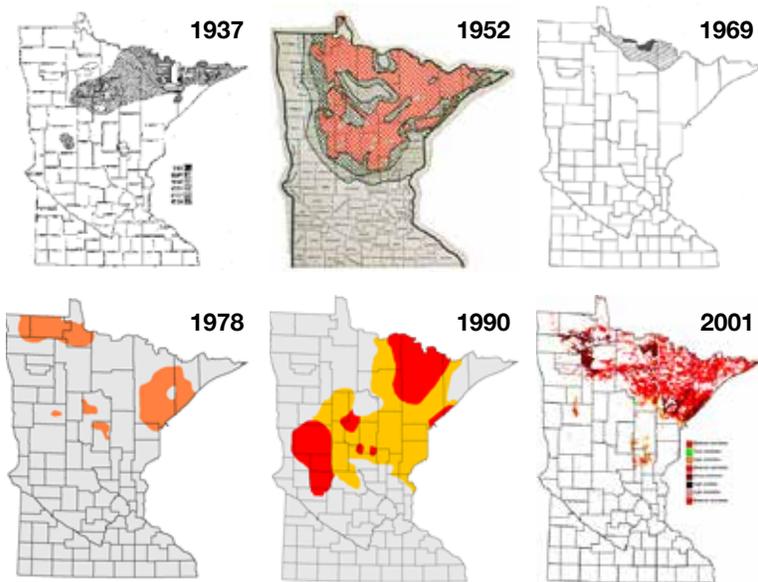
		
<p>Eastern Tent Caterpillar <i>Malacosoma americanum</i> A) Black head; B) prominent central yellow stripe; C) small blue spots to the side.</p>	<p>Forest Tent Caterpillar <i>Malacosoma disstria</i> A) Blue head; B) prominent central row of yellow keyhole shapes; C) bluish sides.</p>	<p>Gypsy Moth Caterpillar <i>Lymantria dispar</i> A) Beige head with dark marks; B) prominent red dots; C) prominent red dots.</p>

Outbreaks

In Minnesota, outbreaks of forest tent caterpillar develop every 10 to 16 years and can last from three to seven years. During the peak of an outbreak, caterpillars can number from 1 to 4 million per acre. As caterpillars wander in search of food or places to pupate from late May to mid-June, they become a nuisance to people living or vacationing in forested areas. Their cocoons are also a nuisance as they can be very difficult to remove from the sides of buildings. Thousands of crushed caterpillars on roads and sidewalks can cause surfaces to become slippery.

In the west-central counties of Minnesota, forest tent caterpillar populations may synchronize with northern outbreaks or they may have small, localized outbreaks that pop up and collapse quickly. These outbreaks occur in oak, basswood, and aspen, along lakeshores and woodlands and cover a relatively low number of acres.

Forest Tent Caterpillar Peak Years, 1937-2001



In any given location, defoliation is usually noticed for two to four consecutive years. In the past, outbreaks peaked in 1891, 1898, 1912, 1922, 1937, 1952, 1969, 1978, 1990, and 2001. In 2001, forest tent caterpillars defoliated more than 7.5 million acres of hardwoods, the most ever recorded in Minnesota.

Natural controls such as a cold or wet spring, starvation, and disease can cause populations to crash after an outbreak peaks. Populations may also be reduced significantly by natural enemies that attack forest tent caterpillar eggs, larvae, and pupae. Populations of the large gray “friendly fly” (*Sarcophaga aldrichi*) build along with those of forest tent caterpillar and are an important part of ending an outbreak. These flies are also native to Minnesota. Their larvae consume forest tent caterpillar pupae inside cocoons. Even though they are beneficial, friendly flies also become a nuisance because they repeatedly land on people.

Impacts

Defoliation from forest tent caterpillars usually causes little damage to healthy, vigorously-growing trees. Most hardwoods develop a second set of leaves by mid-July. The main impact of several years of defoliation is a reduction in growth. If trees are stressed from drought, root damage, or are over-mature, they also become vulnerable to secondary pests that can kill them in one to three years. Although healthy trees can withstand two to three years of defoliation, repeated, heavy defoliation of aspen mixed-wood forests by forest tent caterpillars reduces forest production and influences forest composition.

Management for Home Yards and Gardens

Forest tent caterpillars can be very annoying and frustrating to deal with when they reach large numbers, especially later in June when the fully-grown larvae begin to search for places to pupate. Caterpillars crawl everywhere, on buildings, sidewalks, and in yards, and cocoons appear on houses, lawn furniture, and other structures. Management of forest tent caterpillar for the homeowner can be accomplished in two ways: mechanically or chemically.



Mechanical control of forest tent caterpillar is control by hand. Where practical, remove egg masses from small trees before the eggs hatch in early spring. Brush caterpillars and cocoons off houses and outdoor furniture with a stiff broom or brush or knock them down with a forceful spray of water. Avoid crushing caterpillars or cocoons on painted surfaces, as they may cause a stain if smeared.

Insecticide treatments are most effective against defoliation when applied while the caterpillars are small. Treatment becomes less effective as caterpillars reach 1 inch in length. In addition, the damage to trees has already been done. *Bacillus thuringiensis* var. *kurstaki* is a biological insecticide made from a bacterium that occurs naturally in the soil and is very effective against caterpillars without harming beneficial insects. Insecticidal soaps may also be used against forest tent caterpillar while conserving beneficial insects.

To minimize the nuisance of caterpillars crawling on houses and buildings, an insecticide labeled for this use can be effective. Treat only the outsides of buildings and follow label directions carefully. Do not repeat spray treatments more often than what is instructed on the label. Information on other insecticides for caterpillar control available to homeowners can be found by searching forest tent caterpillar at www.extension.umn.edu.

Management for Woodlots

Since forest tent caterpillar has such a wide host range, silvicultural options for management are severely limited. Forestry practices such as thinning and pruning are not used in forest tent caterpillar management. Thinning during defoliation increases stress in the remaining trees and can lead to high levels of mortality in the thinned stand. Oak and birch are particularly vulnerable. It is preferable to wait an additional growing season after the outbreak ends before doing any stand thinning.

Silvicultural actions are limited to planting non-host species such as red maple or conifers. In general, management options are limited to the acceptance of the growth loss and nuisance or to the improvement of tree vigor so that secondary pests do not attack the weakened trees. The use of insecticide treatments is usually limited to shade trees. Private landowners and resort owners may justify spraying insecticides to protect trees from defoliation or to reduce the nuisance caused by caterpillars during late May and early June. In making this decision, landowners are encouraged to consider their goals, neighbor’s rights, environmental concerns, and their ability to pay for the treatment. It is difficult to achieve satisfactory results with insecticides on areas less than 10 acres or where less than 80 percent of the forested area will be treated.

The DNR provides technical advice to landowners and landowner groups interested in undertaking forest tent caterpillar control actions, but does not oversee or manage them. Forest tent caterpillars are native insects that have evolved with Minnesota’s forests and are an important part of the ecosystem. They rarely cause severe damage to trees, so forests do not normally need pesticide protection. Natural controls cause the collapse of populations, keeping populations low until the next outbreak cycle is repeated.

Photo credits: Photos are from DNR personnel, Forestry Images, and University of Michigan.

Project was funded in whole or in part through a grant awarded by the USDA, Forest Service, Northeastern Area State and Private Forestry.

This information is available in alternative formats to individuals with disabilities by calling (651) 296-6157 (Metro Area) or 1-888-MINNDNR or Telecommunication Device for the Deaf/TTY: (651) 296-5484 (Metro Area) or 1-800-657-3929.

© 2021 Minnesota Department of Natural Resources

Equal opportunity to participate in and benefit from programs of the Minnesota Department of Natural Resources is available to all individuals regardless of race, color, creed, religion, national origin, sex, marital status, public assistance status, age, sexual orientation, disability or activity on behalf of a local human rights commission. Discrimination inquiries should be sent to MN-DNR, 500 Lafayette Road, St. Paul, MN 55155-4031; or the Equal Opportunity Office, Department of the Interior, Washington, DC 20240.