

THE PURDUE LANDSCAPE REPORT

Spongy Moth in Spring Time

By: Bob Bruner, rfbruner@purdue.edu

Spring is always a wonderful, if somewhat chaotic, time of year in Indiana. Between the heavy rains and beautiful flowers blooming, the months leading up to summer can make your head spin. While we enjoy the trees greening out and watch out for storms, we need to be aware that spring awakens other organisms, many of which have a major impact on our lives. This time of the year introduces a host of insect species hatching from eggs, emerging from cocoons, or returning from their overwintering nap, and many of those species mean bad news for our trees. One of the most impactful species we deal with in Indiana is *Lymantria dispar*, or the spongy moth.

The spongy moth, so named for the sponge-like egg masses they lay in the early fall, is an invasive species belonging to family Erebiidae, a large group of moths that include species such as the woolly bear we see every year in Indiana. Spongy moth is a native to Eurasia, and historical record shows it has caused problems throughout Europe as early as the seventeenth century. In the late nineteenth century, an amateur entomologist and would-be entrepreneur brought spongy moth to North America in a failed attempt to create a new silk moth hybrid. Inevitably, the insect escaped captivity and has since spread through several states over the last century, including the northern portion of Indiana.

Spongy moth is a generalist pest that strips leaf tissue from many species of trees, though it has a particular preference for oak. Like all butterflies and moths, the larva, or caterpillar, is the damaging form of this insect. Spongy moth caterpillars bear chewing mouthparts they use to consume leaf tissue, but they do not attack wood or root systems of their hosts. Adults are non-feeding and only survive long enough to reproduce. Spongy moth can produce large populations each year and move quickly across a landscape, creating sudden infestations and near-complete defoliation in those areas. While trees will typically recover after losing a significant portion of their leaf tissue, repeated infestations will make a host tree more susceptible to disease, reduce resilience, and potentially lead to death.



Figure 1: Spongy moth caterpillar, credit to John Obermeyer

Like other moths and butterflies, spongy moth has well-defined life stages that can be used to easily identify them. Caterpillars will begin to appear between mid-April and early May and can be identified by their hairy appearance, distinct black, blue, and red coloration, and the tendency to move up and down the surface of a tree (Fig. 1). Male larvae will develop through five instars, while female larvae will grow over the course of six instars. Larvae will enter the pupal stage midsummer and spend approximately ten to twelve days developing. The pupae of this insect are darkly colored and lack the silk cocoon seen in other species. Adult male moths will emerge in the latter half of the summer season, followed by female moths about a week later. The moths can be identified by the pattern on their wings: a black chevron associated with a dot on a pale white or cream background (Fig. 2). Male moths will have large, feathery antennae and are capable of flight, while females are flightless with smaller antennae. Adult moths will only survive for a few days to reproduce and lay sponge-like egg masses, which will overwinter and hatch the following spring (Fig. 3).



Figure 2: Mating spongy moth adults, credit to John Obermeyer

Management of spongy moth often involves work by state and federal agencies, such as the Indiana's Department of Natural Resources. Within the Hoosier state, the DNR has quarantined several northern counties to prevent movement of materials that could potentially spread spongy moth even further. They also conduct yearly mitigation programs to eliminate infestations that are outside of the quarantined area. Indiana DNR, specifically the Division of Entomology and Plant Pathology, posts information on all mitigation efforts as well as hosts public meetings so residents understand what treatments are used for spongy moth management, and how it will affect their community.



Figure 3: Spongy moth egg mass on tree, credit to John Obermeyer

Most organizations, including Indiana DNR, typically use two methods to control spongy moth: mating disruption and Btk applications. Mating disruption uses the moth's biology against it by confounding its ability to locate a mate. Spongy moths, like many species, use a chemical signal called a pheromone to attract potential mates; male moths follow the trail of pheromones emitted by a female. By filling an area with the pheromone, the male moths become unable to follow individual chemical signals, resulting in fewer eggs being laid for the next spring. Pheromones are also highly species-specific, ensuring

little to no impact on other organisms. In Indiana, the chemical used for mating disruption is applied aerially to cover a significant area, and the chemical used is made of food grade materials that break down easily.

Btk applications are also done aerially, coating foliage with a selective pesticide that only affects moth and butterfly species. Btk is a protein derived from a native soil-borne bacteria (*Bacillus thuringiensis kurstaki*) and works by damaging the internal lining of an insect's gut after being consumed. This is a pesticide that is commonly applied to all manner of crops, persists only for a short time in the environment, and only harms insects. It also has the benefit of having minimal impact on pollinators, especially when applied using label directions.

While spongy moth is a serious challenge, there are some options you can use to protect your natural spaces. The first option, and perhaps the most important, is to be vigilant. If you live in or near an infestation, get into the habit of checking your trees for egg masses starting in the late summer through the fall. When you find egg masses, check for small pinholes in the sponge-like covering; the hole is created by a beneficial parasitoid wasp that uses the caterpillars as hosts for their young. You can also destroy egg masses by using a horticultural oil labeled for that purpose, or by scraping off the egg masses into a bucket of soapy water. Also be watchful of egg masses being laid on homes, firewood, or the sides and undersides of vehicles that move through infested areas.

Larvae will begin to appear in late April, with warmer temperatures encouraging populations to hatch earlier. One method of controlling larvae is to use burlap banding as a trap to capture larvae moving up and down the surface of the tree trunk. This can be done by tying a folded piece of burlap around the trunk of the tree at approximately chest height. Caterpillars, attempting to hide from predators during the day, will crawl into the folds. Once the late afternoon arrives, the caterpillars can be removed and destroyed by dumping them into soapy water. You can also use sticky substances in an effort to capture the caterpillars by coating a tree at chest height with it, but this method has several drawbacks. Any substrate that is sticky enough to capture spongy moth caterpillars will also capture any other insect, beneficial and damaging, and could potentially catch small mammals and birds as well.

If you plan to use pesticides, May through June is the best time to apply. Biological pesticides such as Btk, spinosad, and others, are available for homeowner use, as well as systemic insecticides such as dinotefuran and emamectin benzoate. However, given how widespread the caterpillars can be and the heights they can reach, using some insecticides may not be feasible or may require professional assistance. Homeowners and property managers should consult certified arborists to learn what options will be best, and use pesticides as per the label directions.

While spongy moth is now a permanent part of our ecosystem, we still want to limit its ability to move into new parts of Indiana. If you live outside of quarantine areas and find an egg mass, caterpillar, or adult moth, report them by contacting the Indiana

Department of Natural Resources at 1-866-NOEXOTIC, or by emailing DEPP@dnr.in.gov; make sure to include pictures and location. You can also consult your local Extension office for assistance in finding arborists, speaking with specialists, or getting problem insects identified.

Resources:

“Spongy Moth” Indiana Department of Natural Resources.
https://www.in.gov/dnr/entomology/regulatory-information/spongy-moth/#Proposed_Treatment_Locations_for_2024

“Spongy Moth in Indiana” Cliff Sadof.
https://extension.entm.purdue.edu/publications/GM-1/GM-1.html?_ga=2.245068673.549957128.1716993599-309132558.1716993598

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