

# Spongy Moth

Department of Entomology

## Q & A'S ABOUT USING *BtK* TO CONTROL SPONGY MOTH

*Cliff Sadof, Department of Entomology, Purdue University; Phil Marshall, State Forest Health Specialist, Megan Abraham, State Entomologist, Indiana Department of Natural Resources*

### Q: What is the spongy moth, and why is it a problem?

**A:** The spongy moth (formerly called the gypsy moth) is an insect with a big appetite for oaks. In 2022 it defoliated over 9 million acres of forest in the United States and nearly 1 million acres in Michigan alone. Each caterpillar can grow up to 2 inches long and can consume up to 11 square feet of foliage from early May until June. When abundant, caterpillars can completely defoliate trees. Although healthy trees can survive defoliation, repeated removal of leaves can kill a tree. Older, less vigorous trees suffering from drought can be killed by a single defoliation. Capable of feeding on 500 plants, this pest threatens Indiana forests and suburban landscapes.

Spongy moth caterpillars are also a public nuisance in recreational and residential areas that are known for their oaks. The rain of caterpillars and their excrement from treetops can discourage even the heartiest Hoosiers from taking a walk in the park. Some people develop rashes or allergies to caterpillar hairs that float through the air.

### Q: What is *BtK*, and how does it kill the spongy moth?

**A:** *BtK*, short for *Bacillus thuringiensis* var. *Kurstaki*, is a bacterium found naturally on leaves and in the soil. These bacteria are tiny little factories that produce protein crystals that kill specific groups of insects.

When eaten, the protein crystals tear the cells that line the intestine of susceptible insects, causing them to die from bacterial infection. The source of this infection can be the *BtK* spores in *BtK* insecticide or any of a number of species of bacteria already present in the insect gut. Death can occur within a few hours to a few weeks after *BtK* application. The strain commonly known as “kurstaki” is used to produce the spongy moth insecticide that kills the caterpillars of various moths and butterflies.

### Q: How is *BtK* insecticide used to kill spongy moth?

**A:** In Indiana, most *BtK* applications are applied from aircraft or spray trucks to areas where spongy moths threaten trees and the public. A series of two sprays is applied in early May, when caterpillars are small and most susceptible to *BtK*. Sprays outside of the generally infested area are applied to eliminate isolated populations of moths, thereby slowing the spread of the spongy moth infestation through the state. In counties where spongy moth is already established, these sprays are designed to prevent or reduce defoliation and nuisance problems.

### Q: Is *BtK* insecticide similar to *Bt* corn?

**A:** The same species of bacteria is used to produce *BtK* insecticide and *Bt* corn. The protein crystals and bacterial spores in *BtK* insecticide are extracted from a soup of *Bt* bacteria that is produced in vats like beer in a brewery. With *Bt* corn, the genetic recipe for making the protein crystal is



Spongy moth larvae feeding. (Photo Credit: John Obermeyer).

in the seeds. Susceptible insects feeding on *Bt* corn plants and *BtK* insecticide die from bacterial infection after the protein crystal tears the intestinal lining.

*BtK* bacteria do not cause diseases in people, mammals, birds, or fish. *BtK* insecticide can cause some minor and temporary irritation to exposed skin, eyes, ears, nose, and throat. However, numerous studies of large communities of people exposed to *BtK* during aerial sprays for spongy moth and other caterpillars have repeatedly failed to find any significant adverse risks to the health of the general public.

*BtK* has been safely used against spongy moth in the north-eastern United States to kill spongy moth since 1980. *BtK* is so safe that plants can be eaten even after they have been modified to produce their own *BtK* protein crystals. This insecticide can also be applied on food crops the day they are harvested. Honeybees, ladybugs, and most beneficial insects are not affected.

**Q: Isn't it better to "be safe than sorry" and completely avoid exposure to *BtK*?**

**A:** Most North Americans have already been repeatedly exposed to *BtK*. Because *BtK* naturally persists in soil and is also sprayed on many crops (including those that are organically grown). It is likely that most of us have been exposed to *BtK* during the course of our daily lives. If a person eats fruits and vegetables purchased at a grocery store, he or she has probably already ingested *BtK*, most likely without any ill effects.

**Q: How can I protect myself from the effects of *BtK* spray?**

**A:** Despite its record as one of the safest pest control methods available, some people may choose to minimize their exposure to the *BtK* spray. To do so, remain indoors at least 10 minutes after the airplanes have finished spraying. Wait until spray or dew has dried before letting children play outside. If for some reason you come in contact with *BtK* spray, wash the affected area with soap and water.

**Q: Will *BtK* sprays kill other butterflies?**

**A:** Yes, but they will not eliminate them. *BtK* only kills butterflies and moths that are in the caterpillar stage. Most of Indiana's butterflies, including Monarch butterflies, are not

in the caterpillar stage until over a month after the aerial spray, when the *BtK* protein has degraded. The spray does not contaminate the area with *BtK* bacteria. Furthermore, only small parts of the forest are targeted for spray. Butterflies outside the spray area are not affected.

**Q: Will *BtK* sprays take the paint off my car?**

**A:** No. Some people living in spray areas have reported the presence of a fine dust after the spray, but this easily washes off and does not harm the finish of painted surfaces.

**TO REPORT SPONGY MOTH**

- Download and use the Great Lakes Early Detection Network App for Android or iPhone.
- Contact the Indiana DNR at 866-NO-EXOTIC.

**FOR MORE SPONGY MOTH INFORMATION**

- Visit Purdue Extension Entomology's Spongy Moth Information Web Site to download free GM series bulletins and get the latest information.
- Order the GM series bulletins at your Purdue County Extension office.
- Contact the Department of Entomology, Purdue University, W. Lafayette, IN, 47907-1158, 765-494-4554, or Indiana Department of Natural Resources at 317-232-4120.



Aerial application. (Photo Credit: John Obermeyer)

READ AND FOLLOW ALL LABEL INSTRUCTIONS. THIS INCLUDES DIRECTIONS FOR USE, PRECAUTIONARY STATEMENTS (HAZARDS TO HUMANS, DOMESTIC ANIMALS, AND ENDANGERED SPECIES), ENVIRONMENTAL HAZARDS, RATES OF APPLICATION, NUMBER OF APPLICATIONS, REENTRY INTERVALS, HARVEST RESTRICTIONS, STORAGE AND DISPOSAL, AND ANY SPECIFIC WARNINGS AND/OR PRECAUTIONS FOR SAFE HANDLING OF THE PESTICIDE.

**April 2022**

It is the policy of the Purdue University Cooperative Extension Service that all persons have equal opportunity and access to its educational programs, services, activities, and facilities without regard to race, religion, color, sex, age, national origin or ancestry, marital status, parental status, sexual orientation, disability or status as a veteran. Purdue University is an Affirmative Action institution. This material may be available in alternative formats.

This work is supported in part by Extension Implementation Grant 2021-70006-35390/IND90001518G-1027053 from the USDA National Institute of Food and Agriculture.