

Prince William County Forest Pest Suppression Program

Fact Sheet on the Biological Insecticide *Bacillus thuringiensis* var. *kurstaki*

What Is *Bacillus thuringiensis* *kurstaki*?

Bacillus thuringiensis *kurstaki*, or *B.t.k.*, is a spore-forming bacterium that occurs naturally in the environment. Spores are highly resistant bacterial cells that are formed in response to environmental conditions. During the process of spore formation, the bacterium also produces crystalline bodies that contain delta-endotoxin, which is a natural substance toxic to certain lepidopterous (butterflies and moths) caterpillars. *B.t.k.* is effective for control of fall cankerworm and many other forest and agriculture insect pests.

How Does *B.t.k.* Work?

B.t.k. is a biological insecticide that attacks the digestive tracts of caterpillars. Caterpillars do not die from being sprayed with *B.t.k.*, or by coming into contact with treated surfaces. The spores and crystals must be eaten before they can act. Shortly after ingestion, the crystals are broken down by the highly alkaline (pH=9) digestive system of the caterpillar. This causes the release of the toxin. Within one to two hours, the toxin ruptures the cells in the gut wall and causes the caterpillar to stop feeding. Bacterial cells in the gut can now contaminate the blood of the caterpillar through the ruptured gut wall. Once in the blood, the bacterial cells multiply, causing the death by starvation to the caterpillar in seven to ten days. Susceptibility to *B.t.k.* is generally dependent upon the species, size and age of the caterpillar, with smaller caterpillars being more susceptible.