

Bacterium Curbs Tree Defoliation



Pesticides containing *Bacillus thuringiensis* in sufficient amounts kills caterpillars in 24 to 72 hours.

MICROBIOLOGISTS at Wayne State University in Detroit, Mich. have discovered that *Bacillus thuringiensis*, a component of several commercial pesticides on the market today and effective against many insects of the Lepidoptera order (butterflies and moths), will eradicate the tussock moth caterpillar too.

Edward Hoffman, who worked with Professor Harold W. Rossmoore, of the W.S.U. Biology Dept., on the project, reports *Bacillus thuringiensis* has been proven not to harm anything except about 100 insects, almost exclusively the larvae of the moth-butterfly group. Hoffman

Tussock moth caterpillar, below, breeds in quantity.



states the organism has been safely fed in large test doses to beneficial insects such as bees and beetles plus birds and animals.

"The silkworm was one notable exception that has suffered fatally from eating it," he reveals.

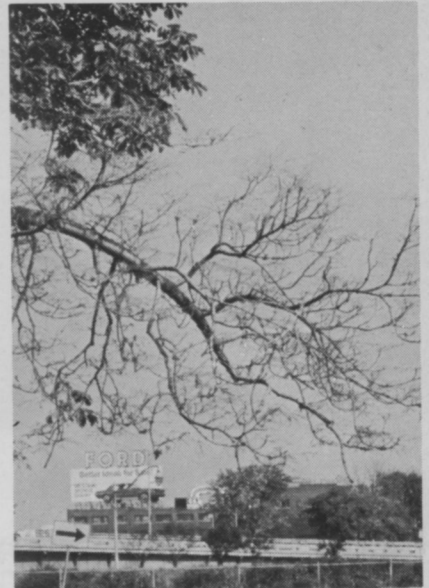
Bacillus thuringiensis, according to the *Pesticide Handbook*, 1968, published by Science Publishers (P.O. Box 798, State College, Pa.), can be found in the following products:

1. Stauffer Thuricide
2. N.P.I. (Nutrilite Products Inc.) Bio-Guard
3. E-Z Flo Tobacco Formula-B.T.B.

The bacterium is suspended in liquid. Landscape gardeners should follow a spray schedule identical to chemical insecticides.

The tussock moth caterpillar is a serious threat to ornamental trees. It can be found over a good portion of the United States, especially the eastern and central states.

Hoffman points out, "This insect is capable of defoliating entire trees in large enough quantities. Leaf damage around our university is evident where the tussock moth caterpillars literally number in the thousands.



Tussock moth caterpillars can quickly strip ornamental trees of their foliage.

"You can imagine how the population growth of the pest could reach disaster proportions when you consider an egg mass of the insect with about a 1/2-inch diameter could contain as many as 400 eggs.

"It's this availability that led to our findings concerning *Bacillus thuringiensis*. We needed an insect that was easy to raise in a laboratory so that we could study the effects of radiation on the susceptibility of insects to bacterial infection. It turned out we found this animal susceptible to this particular bacterium."

Bacillus thuringiensis is unusual, because it forms parasporal bodies popularly known as crystals. It is this crystalline material that causes the paralysis of the gut of the tussock moth caterpillar enabling the bacterium to grow inside the insect's intestine.

"It takes from 24 to 72 hours for the tussock moth caterpillar to die following ingestion of lethal amounts of the bacterium," Hoffman says.