

Getting closer to a better biocontrol for garden pests

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U.S. Department of Agriculture (USDA) scientists have found strains of bacteria that could one day be used as environmentally friendly treatments to keep caterpillars and other pests out of gardens and cultivated fields.

Researchers with the USDA's Agricultural Research Service (ARS) surveyed the agency's bacterial collection and discovered that strains sharing the ability to produce a particular enzyme survive being fed to caterpillars longer than those that don't. Such survivability makes them better candidates for controlling crop and garden [pests](#). The results, published in *Biological Control*, support the USDA priorities of agricultural sustainability and promoting international food security.

Bacillus thuringiensis (Bt) is a bacterium now used to control gypsy moths, tent caterpillars, leaf rollers, canker worms and other pests that attack gardens, corn and other crops. But the commonly used strain, *Bacillus thuringiensis kurstaki*, doesn't survive more than one generation. After an initial round of pests is killed, they die out and the pests return.

Michael Blackburn, an entomologist at the ARS Invasive Insect [Biocontrol](#) and Behavior Laboratory in Beltsville, Md., and his colleagues searched among the Beltsville Bacteria Collection's 3,500 Bt strains for those that would not only kill an initial generation of pests, but would kill subsequent generations. The search was part of an overall effort to classify strains in the collection based on compounds they metabolize and produce.

The researchers tested 50 strains of Bt known to be toxic to gypsy moths, including kurstaki, and found they could be divided into two groups: those that produce the enzyme urease and those that don't.

The researchers fed the 50 strains to gypsy moth larvae and when those caterpillars died, they ground them up and applied them to pellets of artificial diet. They then fed the pellets to another cycle of [caterpillars](#). The researchers looked at the survival rates of the bacteria over several generations and found that urease-producing phenotypes survived better when repeatedly fed to gypsy moths.

The results bring scientists a step closer to finding a Bt strain that will be more effective at combating gypsy moths and possibly other insect pests. The efforts could also lead to the discovery of Bt strains that grow on mulch, fight pests on specific crops and thrive in gardens.

More information: [Read more](#) about this research in the March 2011 issue of Agricultural Research magazine.

Provided by United States Department of Agriculture

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