

# Trap Crops Prove Irresistible to Diamondbacks

Cabbage, broccoli, collards, kale, and other cole crops are an all-you-can-eat salad bar for diamondback moths, a pest named for the diamond-shaped markings embellishing its wings. Moth larvae, which chew on plant leaves, take a big bite out of cabbage and other crops worldwide, costing billions of dollars in control costs and losses.

Pesticide spraying can be costly, ranging from about \$10 to \$21 an acre for each application—depending on which pesticides are used—and typically costing growers \$80 to \$168 per acre, or more, each season to produce a crop. To the farmer's dismay, diamondback moths are becoming resistant to almost everything, including *Bacillus thuringiensis* (Bt)-based insecticides that are widely used to kill certain pests while preserving beneficial insects.

Now entomologist Everett R. Mitchell is taking another approach to spoiling the moth's meal. He says giving the pest a heaping serving of another vegetable—collard greens—spoils its appetite for cabbage. The moths can't resist the collards when planted completely around the edge of cabbage fields, a strategy called trap cropping.

"Invading diamondback moths stop and deposit their eggs on the collards, rather than on adjacent cabbage plants," says Mitchell. "Diamondback populations continue to recycle in collards as long as plants remain green and continue to grow." Mitchell heads the Insect Behavior and Biocontrol Research Unit, which is part of ARS' Center for Medical, Agricultural, and Veterinary Entomology in Gainesville, Florida.

Mitchell recently conducted experiments on nearby farms in northeast Flor-

ida that showed that the moths prefer to feed on highly fertilized collard plants. He tested this approach for more than 2 years. In all cases, he says, there was minimal cabbage damage from diamondback moth larvae. The quantity and quality of cabbage produced equaled that from conventionally sprayed fields.

This simple, low-tech, cost-effective pest control method also reduced pesti-

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Diamondback moth larvae feed on a cabbage leaf.

cide use. "Cabbage fields surrounded by collards required 75 to 100 percent fewer sprays to control diamondback moths than fields treated conventionally with pesticides. That's a huge savings for farmers," notes Mitchell.

He also says *Diadegma insulare*, a naturally occurring parasitoid that attacks diamondbacks, builds in numbers in the collards and helps keep diamond-

back populations in check. The tiny *D. insulare* wasp stings the larvae, preventing them from developing into adults and laying more eggs. Once stung, a larva becomes sluggish and stops feeding within a few hours. The wasp doesn't attack other insects or humans.

"We established that there needs to be a threshold of 0.3 moth larva per plant before a farmer has to apply pesticides," Mitchell says. "We found that even though moth larval populations built up in collards planted around field margins, populations in cabbage generally remained well below the threshold."—By **Tara Weaver, ARS.**

*This research is part of Crop and*

*Commodity Pest Biology, Control, and Quarantine, an ARS National Program that can be viewed at <http://www.nps.ars.usda.gov/programs/304s2.htm>.*

*Everett R. Mitchell is in the USDA-ARS Behavior and Biocontrol Research Unit, 1600 S.W. 23rd Dr., Gainesville, FL 32604; phone (352) 374-5710, fax (352) 374-5804, e-mail [emitchell@gainesville.usda.ufl.edu](mailto:emitchell@gainesville.usda.ufl.edu). ♦*