

Researchers Look For A Few Good Bugs

UNIVERSITY PARK (Centre Co.) — Growers of poinsettias and other greenhouse crops face difficult adversaries in their efforts to bring healthy plants to market each year.

A variety of insect pests can reduce crop yields and quality, cause economic loss, and lead to greater reliance on chemical pesticides. But with the help of Penn State researchers, growers are finding new allies in their battle against bugs.

Penn State scientists have used beneficial insects successfully to help manage pests in poinsettias and greenhouse tomatoes. Pest control strategies arising from the research could greatly reduce, or even eliminate, the use of insecticides in many greenhouses.

"Insect pests can devastate a greenhouse crop," said Cathy Thomas, an entomology research technologist in Penn State's College of Agricultural Sciences. "But growers no longer can rely on conventional pesticides because of concerns with worker safety, insect resistance, food safety, new government regulations and a lack of registered chemicals for greenhouse use."

Greenhouse production is a highly valuable industry in Pennsylvania. Annual wholesale receipts in the specialized greenhouse vegetable and floriculture sector are more than \$130 million.

More than a dozen commercial greenhouse operators have cooperated with the Penn State researchers to study biological control as part of an integrated pest management (IPM) strategy. The program, which began in 1989, is supported by the Pennsylvania Department of Agriculture and the Pennsylvania Vegetable Growers Association.

"Good things seem to happen when you reduce pesticides in the greenhouse," said Alan Michael, the Penn State Cooperative Extension horticulture agent who initiated the project. "Natural predators come in, insect populations stay low, crop quality improves, employees are happier, you tend to meet more of the regulations imposed on growers, and you get a little better harvest."

In the project's first phase, scientists used a tiny, stingless wasp, *Encarsia formosa*, to control greenhouse whitefly. The wasp attacks whiteflies by laying eggs in-

side the pests' larvae. When the eggs hatch, the emerging wasps feed on the larvae, which soon die.

The parasite is so effective that many participating growers have practically eliminated pesticide spraying to control whiteflies. "In some cases, we've found that *Encarsia* can virtually wipe out whiteflies in poinsettias," said Thomas. "We've gone into the sales season with hardly any whiteflies left. That's never happened in tomatoes, but the wasps significantly reduce the pest."

In most cases, success depends on when the beneficial insects are introduced in the greenhouse. "You have to introduce beneficials rather early, while you still have low levels of infestation," said Dr. Michael Orzolek, professor of vegetable crops. "But you never want to completely eliminate the pest. If you always have a low pest population, the beneficials can feed and reproduce. Our research shows that small numbers of pests aren't a problem for crop quality and quantity."

The use of biocontrol offers several advantages over traditional chemical pesticides, not the least of which is worker safety. "Green-

house workers often are women of child-bearing age, and they have a right to be concerned," said Michael. "In most cases, greenhouse employees involved in this program were delighted they no longer had to enter a confined space to handle plant material containing pesticide residues."

Eliminating pesticides also allows native beneficial insects to migrate into a greenhouse. "In one instance, we had an invasion of green peach aphid," said Dr. Paul Heller, professor of entomology. "Since no pesticides had been used in the biocontrol house, native parasites migrated in and took care of the problem. In the grower's other houses, where pesticides had been used, he had to spray to get rid of the aphids."

The absence of chemicals also reduces the risk of pesticide poisoning of plants, and protects plants from physical damage caused by tanks, hoses and sprayers being pulled through the greenhouse. In addition, biocontrol permits the use of bumblebees for natural pollination, which often increases fruit quality and yield.

Researchers now are studying biocontrol for other greenhouse

pests, such as aphids and western flower thrips. The latter pest is especially serious because it is the primary carrier of tomato spotted wilt virus, a disease that can infect hundreds of greenhouse plant varieties. In 1989 and 1990, the virus was responsible for nearly \$700,000 in lost sales of greenhouse plants in Pennsylvania.

The researchers say several issues must be addressed before biocontrol is more widely adopted. Some growers need more information to be receptive to IPM. More research is needed to develop better beneficial insects for some pests. And more suppliers are needed to improve availability and quality control of beneficials.

In the meantime, a grower who has participated in the Penn State research recommends biocontrol to other greenhouse operators. "They soon won't have any choice," said Boyd Mertz of Northumberland. "Growers who aren't looking at biocontrol have their heads in the sand."

"When we first started this project, growers laughed," said Thomas. "Using bugs to control bugs? They don't laugh anymore. Now they listen."

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CORN TALK
PENNSYLVANIA MASTER CORN GROWERS ASSOC., INC.
Corn Talk, Lancaster Farming, Saturday, February 13, 1993

Corn Grower President Has Model Conservation Farm
EVERETT NEWSWANGER
Managing Editor
QUARRYVILLE (Lancaster Co.) — If weeds are not controlled you are going to get a greatly reduced crop. The most limiting factor in corn production is water and weeds take it.
The author of this quote Grant Troop, president of Pennsylvania Master Corn Growers, knows how to grow a good crop. He is also very conscientious.
Troop graduated from Penn State with a degree in agronomy in 1973 and immediately started to work the family farm west of Georgetown. Before his time the farm was a concentrated livestock operation and there were only four large fields on the farm. These fields contained corn, soybeans and alfalfa.
Many of the earlier chemicals I didn't use anyway because of the suspicion of danger. I use all the safeguards and recommendations on the label and I feel I'm doing a safe job of farming. It works for me.
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CORN TALK
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Brothers Pay Attention To Kind Of Corn They Plant
BONNIE BRECHBILL
Franklin Co. Correspondent
McCONELLSBURG (Fulton Co.) — A yield of 213 bushels of corn per acre made the Glenn brothers of McConellsburg members of the Five Acre Corn Club. Their farm is along Route 555 south of Fulton County's section 10.
We didn't do anything special to obtain that yield. Richard Glenn said they chise plowed and disked then planted the seed with their row spacing of 38 inches and eight pounds of seed per acre. We sheeted Richard and
The plot received 20 pounds of 30-10-10 fertilizer and was sprayed with 145 units of nitrogen with herbicides at planting time. The brothers also spread manure on the plot while the rest of the
write block put on it. The three Glenn brothers, Richard, 43, Dave, 39, and Mike, 36, farm in partnership about five miles south of McConellsburg. They purchased the cows and machinery from their father, Ralph Glenn, in 1977 and run 800 acres from their farm a total of 700 acres and milk 137 cows.
A custom Management and Farming, Troy, Ohio, handles the corn. It is the only corn in the county that is planted in the
Besides their 15 acres of corn, the Glenns raise all types of wheat and oats. Some land is in timothy and pasture. While not all their fields equalled the 213 bushel yield, 50 acres on the home farm averaged 185.195 bushels in the acre while the rest of the
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