

Control of persistent tomato pest looks promising

BELTSVILLE, Md. — The future outlook for controlling the destructive Colorado potato beetle looks brighter now that two U.S. Department of Agriculture entomologists have found a bacterium deadly to the beetle grubs.

George E. Cantwell of USDA's Agricultural Research Service reported that a variety of the bacterium *Bacillus thuringiensis* (B.t.) killed more than 85 percent of the beetle grubs in two experimental field tests — one on potatoes, the other on tomatoes. Weekly spraying prevented the young grubs from developing into destructive "older" grubs and provided almost complete protection to the plants, he said. Adult beetles were not killed but stopped feeding after about a week.

Several commercial B.t. preparations are being used to control gypsy moths, cabbage loopers and cotton pests, among others. Another species of this bacterium, commonly known as milky spore, has been used for over 35 years to control Japanese beetle grubs in lawns. However, none of these products is effective against the Colorado potato beetle, Cantwell said.

Cantwell and colleague William W. Cantelo reported their efforts to solve the Colorado potato beetle problem here at a symposium on small farms research sponsored by the Beltsville Agricultural Research Center where the two scientists conduct their research.

The beetle causes millions of dollars in annual losses to potato fields in the Northeast and Northwest and to tomato and other related vegetable plants as well. Tomatoes are one of the leading cash crops of small farms in the

Northeast, and the beetle is the insect pest of greatest concern to growers because it is rapidly becoming resistant to insecticides. Some farmers are spraying weekly when beetles are abundant, Cantelo says. While frequent spraying may protect the standing crop, it serves to accelerate beetle resistance, he cautioned.

To postpone this resistance, Cantelo is developing a model that will predict reductions in yield from several different starting populations of the beetle. "This information may enable growers to reduce pesticide treatments," he said.

The brightly colored adult beetles emerge from the ground in May and live about 30 days, feeding and producing offspring which produce more offspring. By the middle of August, the progeny of one pair of beetles could consume 45 square feet of tomato foliage a day according to laboratory feeding studies, says Cantelo.

In field studies, he used the date obtained in these feeding studies to simulate beetle damage to tomato plants. By removing foliage at the same escalating rate, he found that one pair of beetles infesting garden variety tomatoes in late May would completely defoliate 20 plants by the end of July and 60 plants by mid-August.

In both cases the seasonal yield was reduced by at least 50 percent. One pair of beetles would also cause substantial seasonal losses in commercial variety tomatoes. However, beetle feeding would not be so destructive to the commercial grower because most of these varieties are generally plowed under after they produce the bulk of their crop in mid-

summer before the beetle population peaks, Cantelo explained.

"Getting control over the first generation of beetles would help keep their populations below damaging levels for the rest of the growing season," says Cantelo.

Farmers may soon have the option of using a biological insecticide to get early control and, at the same time, stem the insect's resistance. (Biological insecticides are not known to elicit resistance.) One company that produces another B.t. product is interested in the scientists' new B.t. variety (*Bacillus thuringiensis* var. *thuringiensis*) and could have it on the market in about two years, Cantwell said in an interview after the meeting.

Although B.t. products have not

been widely accepted by farmers, probably because they are slower acting than chemical insecticides, they have several other advantages over chemical insecticides. They are nonpolluting and can be sprayed on crops up to the time of harvest. And fruits and vegetables can be eaten right after spraying, says Cantwell.

During the course of these experiments, Cantwell learned from a visiting Russian scientist that a toxin produced by another variety of the B.t. bacterium has been used to control the Colorado potato beetle in the U.S.S.R. since 1972.

The USDA scientists tested three dilutions of the culture stock in their field experiments. They spray containing 0.5 percent B.t. killed more than 85 percent of the

Colorado potato beetle grubs, and a fivefold dilution (0.1 percent B.t. gave 80 percent control. Each spraying was effective for about 10 days. That would indicate the need for weekly spraying when the adult beetle population builds up, but an improved commercial formulation could extend its effectiveness, Cantelo said.

In temperate climates, the beetle has two to three generations during a growing season. B.t. alone should control the pest unless a very large population is attacking seedlings or small plants, in which case a fast acting chemical insecticide may be necessary, Cantelo explained. The scientists recently published their findings in the September issue of the *American Potato Journal*.

McConaughey is national Jersey scholarship winner

LOUISVILLE, Ky. — Darlene McConaughey of Smucksburg, was named a winner of the 1981-82 William S. Russell Memorial Scholarship.

The \$600 scholarship, sponsored by the American Jersey Cattle Club is awarded to two junior Jersey members in the nation who have an interest and background in Jersey cattle. The award was presented based on Darlene's 4-H accomplishments.

Darlene is a freshman at Penn State University majoring in horticulture and is a member of Block and Bridle Club, Hort Club,



Darlene McConaughey

and Collegiate 4-H. Darlene's high school activities included Future

Business Leaders of America, Dramatics Club, and Girls Wrestling Association.

Darlene has been involved with Jerseys all of her life, and began showing with her family before she was old enough for 4-H. Her accomplishments include: 1980 Pennsylvania 4-H Commodity Marketing Award, Pennsylvania Olmstead Jersey Achievement Award, Outstanding Indiana County 4-H Dairy Member, and 1976 Pennsylvania Champion Jersey Fitter and Showman. Darlene's Jersey herd consists of ten cows and several heifers. In addition to Jerseys, Darlene raises Suffolk and Southdown sheep, Duroc hogs, and is employed parttime with Shireman Florists.



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| Ford 8000 D | 1100D |
| Ford 740 | Allis Chalmers 190 XT |
| Ford 6000 | Massey Ferguson 178 D |
| Ford 641 D | on metal wheels |
| Ford 901 SOS | Farmall Cub w/Plow & |
| Ford 2000 D | Cult. |
| (2) Ford NAA | Farmall 230 w/Loader |
| Ford 4000 | Oliver 550 w/Loader |
| Ford Dexta | Kubota B 6100 Hyst. w/ |
| Ford 5000 D | Mower |
| Ford 601 w/Loader | Kubota B 5100 w/ |
| Massey Ferguson 65D | Mower |
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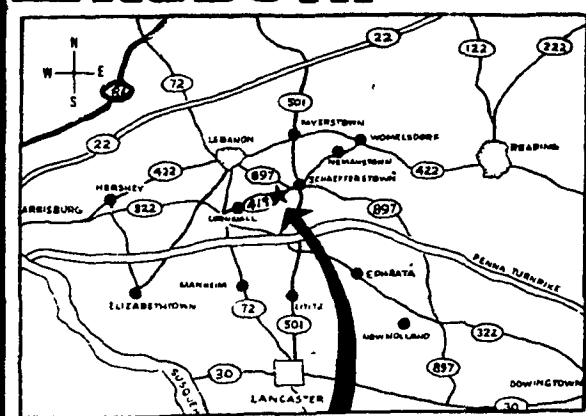
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