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Trapping and Other Strategies for Cucumber Beetle Management

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Abstract
Spotted and striped cucumber beetles vector a bacterium that causes wilt in cucurbits (plants in the gourd family). These beetles are the major pest of muskmelons in Iowa. We investigated the success of a prototype Trecé brand trap and bait system, soon to be OMRI-approved (Organic Materials Review Institute), that chemically lures beetles to insecticide-treated bait inside a trap some distance away from the muskmelon crop. We also tested the success of Reemay fabric row covers, clear slitted plastic row covers, and BioYield seed treatment. BioYield is a seed inoculant that includes a variety of plant growth-promoting rhizobacteria.

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Introduction

Spotted and striped cucumber beetles vector a bacterium that causes wilt in cucurbits (plants in the gourd family). These beetles are the major pest of muskmelons in Iowa. We investigated the success of a prototype Trecé brand trap and bait system, soon to be OMRI-approved (Organic Materials Review Institute), that chemically lures beetles to insecticide-treated bait inside a trap some distance away from the muskmelon crop. We also tested the success of Reemay fabric row covers, clear slitted plastic row covers, and BioYield seed treatment. BioYield is a seed inoculant that includes a variety of plant growth-promoting rhizobacteria.

Materials and Methods

'Athena' muskmelon seedlings were planted in 25 foot rows of black plastic mulch at the ISU Horticulture Farm, the Armstrong Research and Demonstration Farm in Lewis, and the Muscatine Island Research Farm in Fruitland. Each location included two fields, a trapping field and a control field. The trapping field was surrounded by two concentric rings of traps 50 and 65 feet from the planted area. There were four replications of the row cover and BioYield treatments in each field. Yellow sticky cards placed in each plot were counted and replaced at the same time the traps were counted and emptied, once/week through the end of harvest. Bacterial wilt ratings (number of wilted plants/plot) were taken at the first sign of disease at each location, and melons were counted, weighed, and inspected for disease and insect damage at harvest.

Results and Discussion

There was no significant effect of the row covers or the BioYield seed treatment on beetle populations or melon yield this year. The effect of the traps on yield was inconsistent. Although the traps seemed to decrease yield at Armstrong, herbicide damage may have been responsible for these lower yields (Table 1). There were fewer wilted plants and striped and spotted beetles in the trapped field than control field at Ames, but the reverse was true at Armstrong (Tables 2 and 3). The herbicide-damaged plants in the control plots at Armstrong may have been less attractive to the cucumber beetles because they were smaller and had fewer blossoms.

Because the effect of the traps on beetle populations in the field was inconsistent, we need to better understand the effect of the traps on the beetles' behavior. The traps caught more spotted beetles than striped beetles over the season, thus we suspect that the baits and lures may not be attractive enough to the striped beetle. In addition, plots of trap counts over time show peaks of beetle captures on the date when the volatile trap lures were replaced (Figure 1). We found similar results in previous years, so we plan to modify our trapping strategy with either different types of lures or more powerful lures. We will also test alternative beetle control strategies next year.

Acknowledgments

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Table 1. Mean total weight (marketable + cull), marketable weight, number of marketable melons, and marketable melon weight in a single plot for the traps and control fields at three Iowa locations.

Location	Field	Number marketable (per plot)	Marketable weight (lbs/plot)	Number cull (per plot)	Cull weight (lbs/plot)
Ames	Traps Field	1.8a	9.2a	2.9a	9.7a
	Control Field	1.9a	9.0a	175.1b	13.5a
	LSD (α = 0.05)	-	-	*152.0*	-
Armstrong	Traps Field	0.8a	3.7a	0.5a	1.4 a
	Control Field	1.7b	7.7b	15.2a	3.4 b
	LSD (α = 0.05)	*0.4*	*1.9*	-	*0.9*
Muscatine	Traps Field	3.0	16.5	8.8	24.6
	Control Field	2.9	17.2	6.6	21.4
	LSD (α = 0.05)	-	-	-	-

Table 2. Average number of wilted plants per plot in the trap and control fields at three Iowa locations.

	Ames	Armstrong	Muscatine
Control	5.2a	3.3b	9.6
Trap	5.1a	6.1a	9.4
LSD (α = 0.05	-	*2.0*	-

Table 3. Average number of striped and spotted beetles per sticky card in the trap and control fields at three Iowa locations.

	Ames		Armstrong		Muscatine	
	Striped	Spotted	Striped	Spotted	Striped	Spotted
Control	25.2a	3.0a	11.4a	5.4a	4.0	0.7
Trap	5.4b	4.2b	45.2b	5.4a	3.6	0.8
LSD (α = 0.05	*5.5*	*1.5*	*9.2*	-	-	-

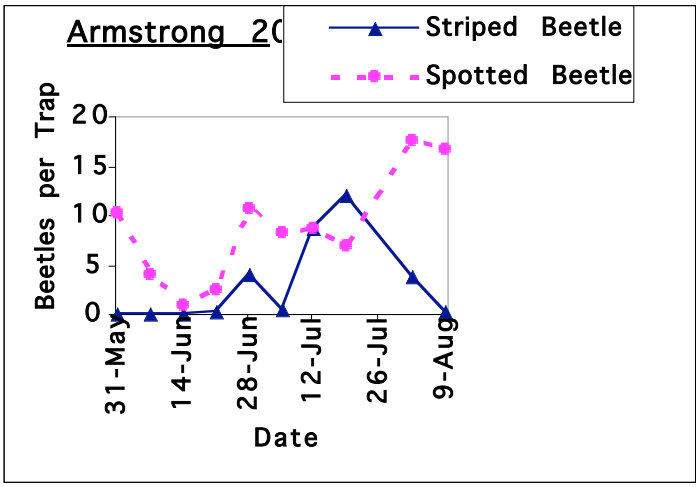

Figure 1. Number of striped and spotted beetles captured in a trap at Armstrong over the 2002 season.