New York State Integrated Pest Management Program

Use of Bt bait solutions and *Beauveria* for control of adult Onion Maggot

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Introduction

Onion maggots (*Delia antiqua*) can cause severe production losses in onion fields in New York State, with losses reaching levels near 100% in the absence of control measures. Onion growers in New York State apply an organophosporous insecticide (Lorsban) as a seed drench at planting time, or an insect growth regulator (Trigard) incorporated in the seed pellet, in an effort to control larval feeding damage to onion seedlings from first generation maggots. The effectiveness of soil insecticides is limited to this first generation, and second and third generation onion maggots are not controlled by soil insecticides.

Pyrethroid insecticides are sometimes used to control adult onion maggot, pretty much during flight peaks of any generation. These pyrethroid insecticides are only partially effective, because only a small proportion of the flies (less than 12%) is actually covered with these sprays. Applications of pyrethroids early in the season have been shown to dramatically increase levels of resistance to pyrethroids in onion Thrips (Jody Gangloff, unpublished). Heavy use of pyrethroids may also be implicated in epidemic population increases of bulb mites (Dr. Chuck Eckenrode, personal communication).

In an effort to provide growers with additional materials and strategies for the control of onion maggot in New York State, we started experimenting with sugar solutions laced with experimental formulations of insecticides containing *Bacillus thuringiensis israelensis* toxin (Bt) (van der Heide & Eckenrode, 1997). Encouraging laboratory results were repeated in commercial onion fields where onion maggots were released into field cages and treated with Bt bait solutions containing Bt toxin at a rate of 30 lb AI/Acre (480 mg/cage).

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