

Final Project Report to the NYS IPM Program, Agricultural IPM 2000-2001

Title: Enhancing the Efficacy of *Beauveria bassiana* for Bedding Plant Insect Pests

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Type of grant: Research and Development Proposal-New, Ornamentals
Biological control and pest biology

Project locations: Greenhouse collaborators were located in Ontario, Onondaga, and Erie Counties

Abstract:

Growers frequently request help in the development of biorational IPM programs for bedding plants, especially vegetable transplants and herbs. Before Cornell Cooperative Extension Educators can recommend insect-killing fungi such as *Beauveria bassiana* for bedding plant protection we must first demonstrate efficacy and show how the products fit into an IPM strategy. In this trial, growers applied Botanigard (*B. bassiana*), Botanigard + Azatin, and Azatin alone to vegetable and flower bedding plants, and herbs to attempt to see whether the insect growth regulator Azatin would increase the ability of the beneficial fungus to parasitize aphids. Few pesticides are labeled for vegetable bedding plants in greenhouses, yet customers want to buy pest-free plants for their gardens. Due to circumstances beyond our control, this field research did not yield any data for comparison of the treatments.

Background and Justification:

The pest management problems for bedding plant growers are complex: several plant species are likely to be grown in any one house during bedding plant season; pest resistance to pesticides is a concern; extended re-entry intervals assigned to pesticides makes it difficult to care for greenhouse plants. These difficulties are dramatically increased for pests on tomato, pepper, or herbs because few products are labeled for use on these food crops. Aphids are especially problematic on edibles because they reproduce so quickly and greenhouse-grown tomato and pepper plants are sensitive to the phytotoxicity of soaps and oils, the standard treatments used on these crops. We fear that non-labeled products are being used on edible bedding plants.

Insect-killing fungi have been tested for management of thrips, aphids, and whiteflies on a number of greenhouse ornamentals in research greenhouses. These research trials began with very high aphid populations on the plants and met with varying degrees of success. We intend to start our trials earlier, as soon as aphids begin to appear on the greenhouse crops and *before* the populations are established and growing. We will monitor plants for all insect pests until sold.

Objectives:

- 1) Set up a *Beauveria* trial at three commercial greenhouse operations, in Ontario, Onondaga and Erie Counties
- 2) Monitor insect populations and *Beauveria*-killed insects on the treated plants, especially aphids; identify the pests present on different bedding plants in the trial
- 3) Assess the success of the various pest management treatments during the season, adapting as necessary according to the pest pressures to maintain crop quality
- 4) Evaluate the project in terms of cost effectiveness and Cooperative Extension recommendations

Procedures:

- 1) Four separate greenhouses are available for this project in Geneva. One will contain 500 flats of tomato bedding plants, one peppers and herbs, and two others assorted annuals.

Treatments:

- insecticide control (Azatin+ Avid on flowering annuals, not edible plants)
- BotaniGard WP
- BotaniGard WP + Azatin
- Azatin alone

At Vollmers, there were three greenhouses and three treatments. In Erie County, Wendell Ireland continued to use Botanigard as usual, but there was no scouting to take data for a comparison.

- 2) The greenhouses were monitored intensively using yellow sticky cards and whole plant scouting to assess pest population and mortality levels. Besides weekly visits by the PI or regular scout (20% time for 6 weeks), visits by Michael Brownbridge increased the level of observation.
- 3) We were not able to compare the success of the various treatments, however we noted that the weekly sprays did not cause any phytotoxicity.
- 4) The biorational approach was very successful in Erie County at the greenhouse where Botanigard is routinely used. Because it is so busy during spring, the grower did not want to conduct a trial in the greenhouse. At two sites, we did not see any aphids. At one site it was necessary to spray with Marathon to clean up the plants for sale.

Results and Discussion:

The interactions with Michael Brownbridge were very useful. The growers appreciated our interactions with them, especially when the scouting results facilitated timely management of the aphid population for a quality crop.

At all three sites we were not able to complete the research. At one site, as soon as the sides of the greenhouse were rolled up for cooling, aphids blew in and reproduced on peppers. Because it was time for the plants to be sold to, they were cleaned up with a Marathon spray application. At a second site, there were no aphids to treat on the vegetable transplants and herbs during the bedding plant growing season. We located a summer crop at a third site, chrysanthemum, and conducted the trial there, but again there were no aphids to treat. The summer of 2001 was drier than normal and that may have influenced the aphid population. We will ask the growers whether they would like to run the trial again in 2002.