

REPORT TO THE NEW YORK STATE CABBAGE RESEARCH ADVISORY
COMMITTEE AND RESEARCH ASSOCIATION, Dec. 1997

PROJECT TITLE: USE OF A FUNGUS, *BEAUVERIA BASSIANA*, FOR CONTROL OF INSECTS ON
CABBAGE, 1997

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During 1997 we continued evaluating *B. bassiana* (Bb) for control of insects affecting cabbage. Our work can be broken down into 2 sections:

Field trials for Caterpillars, Aphids, Flea Beetles and Thrips. We conducted a large field trial to evaluate Bb during a full field season. The treatments consisted of 3 rates of a commercial formulation of Bb, Javelin, Ambush and untreated controls. Throughout the season we evaluated populations of caterpillars and at the midpoint of the season and at the end of the season we evaluated damage to the plants. All analyses are not yet complete but from our preliminary evaluations we see that Bb had some strengths and weaknesses in controlling the complex of insects affecting cabbage. Bb did an adequate job of controlling diamondback moth and imported cabbageworm, but we had substantial populations of flea beetles and aphids during the season and these insects caused a marked reduction in head weight at the end of the season. We therefore would not recommend that these two insects be on the label of this product if it becomes registered in NY. The standard that we chose for controlling the complex of insects through the season (permethrin) did well for most of the season, but control appeared to break down at the end of the season. This appears to have been due to insecticide resistance. When resistance to permethrin did occur, then Bb did appear to work comparatively better. Therefore, we believe there may be a niche for this product, but growers will have to be aware of its limitations.

Lab trials for Cabbage Maggot. In preliminary bioassays, adult cabbage maggots were exposed to dry conidia of isolates of *Beauveria bassiana*, *Metarhizium anisopliae* or *Paecilomyces fumosoroseus*. The flies were exposed to the fungi by placing 5 flies in a centrifuge tube containing conidia scraped directly from culture plates, then released into small screened plastic cages. Mortality was assessed after 48, 120 and 160h. A *B. bassiana* isolate (P89 from *Musca domestica*) caused the highest mortality after 48h. It was also the only isolate that gave 100% mortality and 100% infection. Isolate L90 (*B. bassiana*) and one *M. anisopliae* isolate (ARS 2521) also caused fatal infection in more than 50% of the flies.

In further experiments, flies were exposed to a dry powder formulation containing *B. bassiana* by placing the flies in a small container with Mycotrol®, a commercial formulation of *B. bassiana*, on the bottom. The flies were removed to small screened cages containing untreated flies. This experiment confirmed the ability of flies to pass inoculum to other flies. In a similar experiment, one treated fly was placed in each cage with one untreated fly. When each fly died, one untreated fly was added to each cage after the dead fly was removed. This study showed that fly to fly transfer of fatal doses of inoculum was possible for a chain of at least six flies. Further studies are being conducted to develop a system where flies attracted to a trap will be inoculated with the fungus and spread it to a field population.

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