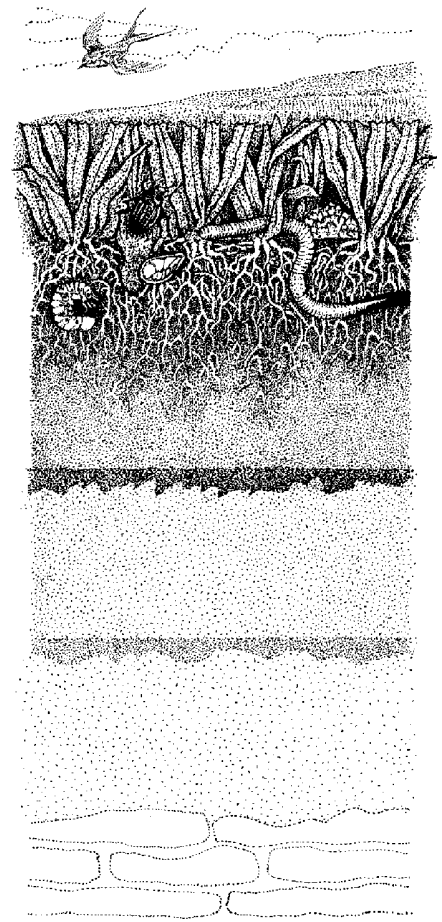


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Biorational Control Agents for Japanese Beetle Management

The development of specialty pest management products often takes a back seat to products that targeted pests of crops such as field corn, soybeans and cotton. Products that were not effective against one or more insect pests on these major commodities had little chance to be tested against insects particular to turfgrass. Although the crop protection industry has focused greater attention on so-called specialty markets such as turfgrass, funding from New York State Turfgrass Association (NYSTA), NYS IPM, and TriState Turfgrass Research Foundation was essential for providing a nonbiased evaluation of these products. Following is a brief review of some of these products together with the results of representative laboratory and field studies conducted by my research team over the past several years. It is important to remember that these studies were conducted under ideal conditions with regards to proper timing, equipment calibration, quality of control agent, and proper environmental conditions. ■

Bacillus thuringiensis

Bacillus thuringiensis (Bt) is a soil living bacterium common in nature that was first discovered in Japan in 1901. There are over 30 subspecies and varieties of Bt. This family of bacteria produces a toxic protein crystal that is active against a fairly narrow group of insect species. Certain Bt products have been used to control insects for many years. Various strains have been identified with activity against cater-

pillars, fly larvae, and beetle larvae. Current commercial Bt varieties include *Bt kurstaki* and *Bt aizawai* (caterpillars), *Bt israelensis* (mosquitoes), and *Bt tenbrionis* (potato beetles).

Because Bt bacteria can be produced in great quantities using artificial media, there is great interest in the commercialization of this bacteria for insect control. The bacteria normally do not reproduce in the insect host, persist

This Times

1. *Biorational Control Agents for Japanese Beetles*
2. *Short Cutts*
 - Rossi Arrives
 - Neal Departs
 - You Win!
3. *Field Diagnostic Workshop*
8. *A Look Back at IPM Programs in 1995*
10. *Enhancing Biological Disease Control with Composts*
16. *The 1995 Drought and Weed Control in 1996*

continued on page 4