

BIOTURF NEWS

Bio-Turf: The Basics

Biological alternatives to conventional chemical control products are more than 30 years old, but are only recently attracting mass attention.

EDITOR'S NOTE: Following are excerpts from an article published in LANDSCAPE MANAGEMENT in November, 1989.

Authored by Dr. John Briggs of the Ohio Agricultural Research and Development Center, the article introduces the workings of biological control products. We also believe interest in biological products has increased considerably over the past three years, and offer this review for the newly-curious.

■ **What they are:** Bio-rational agents are biological alternatives to conventional chemical pesticides. They are micro-organisms that attack and cause diseases of insects, mites and certain weeds. Of five principal groups of micro-organisms, bacteria, fungi and nematodes are used in products marketed for landscapers.

How they work: Milky spore products are a good example of how biological control of insects take place. Milky spore products contain the resting spores of the bacteria *Bacillus popilliae*. These spores physically damage the mid-gut growth of the bacteria in the body cavity of beetle grubs, thereby destroying them.

Such products have been on the shelves for about 50 years. Newer formulations are available for control of flies, beetles and moths. Bacteria that attack caterpillars and mosquitoes are also available, and important progress has been made on nematodes that attack immature forms of insects in the soil and on plants.

How bio-herbicides work: The concept behind biological herbicides is basically

Biological research, originally meant to benefit the agricultural sector, is being applied to turf and ornamental protection.

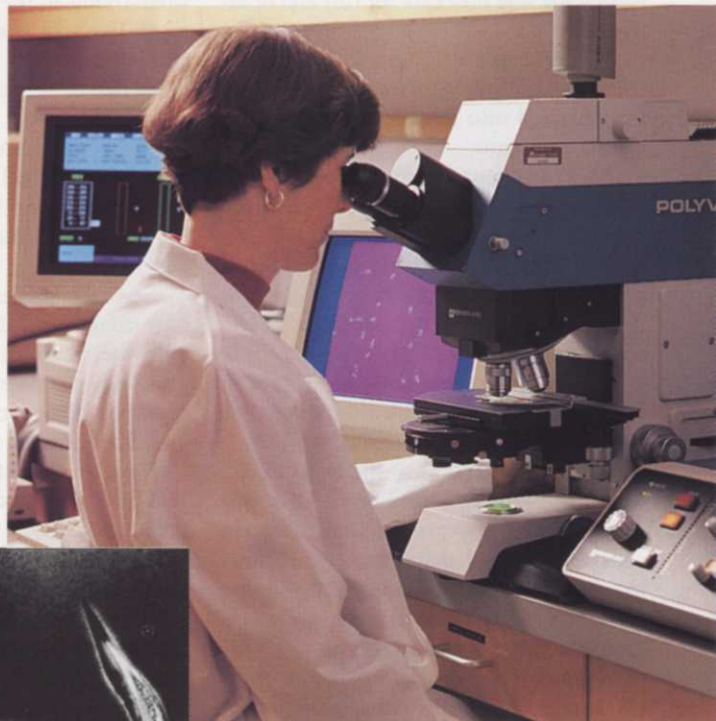
(Photo courtesy of Mycogen.)



the same. In Florida, researchers are looking at specific viruses that infect only aquatic weeds, and Abbott Laboratories has registered a biological herbicide—Devine—for use in certain counties. Landscapers can expect to add bio-rational agents to their weed-control arsenal in the near future.

For the past 30 years, another bacteria, *Bacillus thuringiensis*, (*B.t.*) has been produced and marketed by 20 different companies for managing populations of larval forms of some species of flies, beetles and moths. Several manufacturers in the U.S. have registered formulations of bacteria with the EPA and USDA for landscape use.

Important progress has been made in the production, formulation and market-



Biosys, of Palo Alto, Calif., has perfected fermentation technology to breed trillions of nematodes.

ing of nematodes that attack immature forms of insects in the soil and on plants.

An essential condition for nematode survival is adequate moisture in or on the material inhabited by the immature insect. Moist soil and/or moist plant parts are ideal sites for the activities of *Neoaplectana carpocapsae* nematodes. These nematodes can enter an insect through any body openings, particularly the mouth and spiracle, into the respiratory system.

Nematodes multiply in the body of the attacked insect which, in turn, increases nematode egg production. This action results in a continuous supply of nematodes to control additional generations (if moisture conditions are suitable).

Nematodes respond to the presence of susceptible forms of insects and literally seek out their prey.