Cornell research covers natural/organic bases

Tests suggest chemicals and biologicals may be used together for insect control.

ITHACA, N.Y.—Cornell University researchers who have intensified their biological and organic turf care tests report positive findings from projects begun in 1992.

While some tests suggest biological controls may outperform chemicals in some instances, they also offer hope that chemicals and alternative products can be used in tandem for turf care.

> Preliminary studies show that combinations of fungal pathogens and traditional insecticides might increase grub mortality.

Insect control. In tests using biologically based control agents for scarab grub control in turfgrass, 14 isolates—fungal pathogens of soil insects—were tested against Japanese beetle grubs.

According to Dr. Michael Villani, of the Geneva, N.Y. experiment station, two of the isolates are currently being considered for commercial use. The other 12 were chosen because they were taken from scarab grubs around the world.

Villani: Soil temperature and moisture important.

Villani reports that some isolates were more dependable than others throughout the course of the study, due to a variety of environmental conditions found in city golf courses, mostly combinations of soil temperature and moisture.

"Fungal pathogens don't like free water," says Villani, "and the spores don't survive as well, and don't adhere to the grub as it moves through the soil."

Preliminary studies also showed that combinations of fungal pathogens and traditional insecticides might increase grub mortality and reduce the lag time common for many insecticides in soil.

Villani reports that fungal pathogens were added to composts used for top dressing greens, with encouraging results. Testing in this area continues.

Ideal conditions. As with any chemical control products, environmental conditions must be suited for maximum biological insect control. Villani's studies suggest that under certain environmental conditions—primarily related to soil moisture and temperature—commercially available entomopathic nematodes may outperform standard turfgrass insecticides for grub control.

Disease control. Plant pathologists Dr. Eric Nelson and Cheryl Craft are currently studying biological control strategies with compost-based organic fertilizers. According to Nelson, research conducted in 1992 centered on evaluating composts in the field for disease suppresion, developing laboratory assays to assess microbial activity and biomass and recover isolates of bacteria, fungi and actinomycetes from suppressive composts.

Nelson says data was collected for the suppression of dollar spot with various composts. Snow mold suppression tests are ongoing.

"We hope to understand how disease-suppressive properties of composts might be predicted," says Nelson.

Organic greens. "As peat becomes more difficult to mine, alternative organica sources will likely become common in putting green rootzone mixes," says Dr. Norm Hummel of the university's floriculture and ornamental horticulture departments.

Hummel: Composts may work in golf course greens.

Hummel, Nelson and research associate Mary Thurn made a two-year evaluation of four organic sources in sand-based rootzones for disease suppression, physical stability, and nitrogen mineralization.

In this experiment, they tried to determine the effect of compost on Pythium root rot and the impact of phosphorus on disease severity.

In field trials, a municipal sewage sludge compost, a brewery waste compost and reed sedge peat provided significantly better disease control than either the sand control or a seaweed product. Control was generally better than 80 percent.

Nelson: Compost extracts suppress *Pythium spp.*

In another study, physical properties of laboratory-packed samples were compared to undisturbed field cores taken one after establishment, to determine if measurements taken on laboratory-packed samples could be used to predict physical properties in the field.

Test results suggest that composts may be useful as organic amendments for sand-based rootzones.

For more details of the Cornell research, contact Dr. Hummel, 20 Plant Science Building, Cornell University, Ithaca, NY 14853.