Bagged turf clippings can amount to another 0.5 to 3 tons per acre per year of organic matter on a dry basis. Recent research from the University of Connecticut suggests that leaving the clippings where they fall can improve the quality of turf and even suppress certain turf diseases.

Removing clippings every time turf is mowed diminishes the soil's ability to maintain a proper level of organic matter. This practice can also remove as much as 80 pounds of nitrogen, 20 pounds of phosphate and 60 pounds of potash from every acre of soil annually. A significant amount of secondary and trace elements are removed as well.

Organic matter content can be measured by most soil testing labs using the same samples submitting for nutrient analysis. The results of the test are usually expressed as a percent of soil content. Five percent is an ideal level but is not always practical to obtain. Under certain conditions, building organic matter levels to 5 percent might be impossible (e.g., in tropical soils).

Figure 2 shows that as the average annual temperature increases, the average level of soil organic matter decreases. This is not a maximum value that can exist in any given environment, but suggests that maintaining organic matter will become more difficult (not impossible) as we move closer to the equator.

Any attempts towards improving organic matter levels will usually cause an improvement in overall soil conditions and a significant reduction in the number of problems a land manager might encounter.

Paul Sachs is founder and president of North Country Organics, a Vermont-based manufacturer and supplier of natural fertilizers, soil amendments and environmentally compatible pest controls since 1983. His book, Edaphos: Dynamics of a Natural Soil System, *examines ways in which Sachs believes human beings are linked to the ecosystem, and how that link determines the future of civilization. To order* Edaphos, *call (802) 222-4277.*

Nematodes work against mole crickets at Florida resort town

PALM COAST, Fla.—Parasitic nematodes are being used in the fight against mole crickets at the Florida comunity of Palm Coast.

According to BioControl, Inc., mole crickets are the worst of the pests plaguing Florida turf professionals. The mole cricket causes an estimated $60 million in damages each year.

BioControl says it is the exclusive distributor of the nematodesolution. The spray consists of water and nematodes. The microscopic worms live at least 13 weeks in search of a host mole cricket.

> Researchers say the nematodes will live at least 13 weeks as they search for mole crickets.

"We are pleased to be a part of a very active movement toward environmentally integrated pest management," says Brigid Braun, superintendent at Matanzas Woods Golf Course in Palm Coast, where the nematode application was made on April 20. "We'll probably never be copletely free of pesticides, but biological control holds a lot of promise."

University of Florida entomologist Dr. Grover Smart developed and successfully field-tested the new species of insect parasites over a seven year time span. The University of Florida received a patent on the species in November of 1992.

BioControl, which has done work in nematode science since 1991, is the exclusive licensee of the University's nematode patent.

Callum Macgregor, president of BioControl, says the company has treated 65 golf courses and a dozen cattle pastures and several county school systems

"We expect to complete around 200 applications by the end of 1993," says Macgregor.

Bioturf News reported in July of the fight against the mole cricket. At the time, about five percent of Florida's 1200 golf courses were experimenting with nematode control. It is predicted that as many as 60 percent of the state's golf courses will be using some form of biological control in 10 years.

Nema-whats?

Nematodes are tiny roundworms that live in moist habitats.

Nematodes have diverse habits. Many are scavengers; some feed on fungus. Many are plant-parasitic and others parasitize various types of animals. Approximately 20 families of nematodes have insect-parasitic species. Nematodes can attack species within most orders of insects.

These nematodes search out insects, parasitize them, and then reproduce, resulting in more parasitic nematodes that will kill any additional insects they encounter.

Most insect-parasitic nematodes are harmless to other animals and do not attack plants.

Because of their small size and hidden nature, the benefits of naturally occuriring insect-parasitic nematodes are not always well understood.

Their benefit in the natural control of plant pests is greatest in areas of continuous moisture rather than in more arid areas.

Even in moist situations, however, they may not be abundant enough to provide significant pest suppression without other control augmentation.

EVENTS

December

12-15: American Entomological Society of America annual meeting, in the Indianapolis convention center.

Program includes information on advances in monitoring turf insects; using pheromones to manage turf insects; the host-plant resistance tactic, genetics and endophytes; and a look at the efficacy of milky spore.

New ways to use IPM technology will also be explained.