

Control of White Grubs with Beneficial Nematodes on School Athletic Fields

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Introduction: White grubs are possibly the most important insect pests of athletic field turf in New York schools. While patchy and sporadic in nature, grubs can cause serious damage to turf, and to the untrained eye, this damage might resemble other cultural or disease problems. White grubs are commonly managed with conventional insecticides, such as chlorpyrifos and carbaryl. As public awareness focuses on the risks associated with pesticides, and chemicals like chlorpyrifos are phased out of use, athletic field managers are forced to seek alternatives. This trend has provided the collaborators with an opportunity to demonstrate the use of beneficial nematodes as an alternative control for white grubs. In addition, proper sampling, monitoring, identification, and use of thresholds are fundamental to best management programs for such pests.

Objectives:

1. To teach proper grub sampling and identification.
2. To instruct practitioners in the use of economic thresholds.
3. To demonstrate the use of beneficial nematodes (*Heterorhabditis bacteriophora*) for control of white grubs.

Results and Conclusions:

Methods: The collaborators began this project later in the season than expected, although weather conditions were still favorable at the outset. Preliminary grub sampling was done at the West Islip School district properties, the original collaborating school. When no grubs were found in any turf sampled in the district, fields at Hauppauge SD were suggested due to heavy infestation. In addition, a small school district in Center Moriches had requested help with grubs. Furthermore, the plan included a full plot and demonstration at Timber Point Golf Course, one of three public courses in Suffolk County slated for pesticide phase-out.

Plots were laid out in three locations: Hauppauge School varsity softball outfield, the Center Moriches administration building front lawn, and a fairway at Timber Point Golf Course. All three locations were sampled for grubs to determine the ideal location for nematode plots. Each site had grubs numbering well over standard thresholds for treatment. Grubs were almost entirely in the third instar.

Plots included two different rates (1 and 2 billion per acre) of the same nematode species (Hb) from two different suppliers, and were arranged in RCBD with water-only

control treatments. Nematodes were applied with $\frac{1}{2}$ " of water and plots were evaluated approximately 2 weeks later for results.

Workshops: One large workshop was conducted at Hauppauge School District for buildings and grounds staff of any school choosing to participate. Announcements were handed out at the Nassau and Suffolk Superintendents of Buildings and Grounds Association meetings. A smaller workshop was conducted at Center Moriches for the staff at that school only. Our golf course workshop was cancelled due to destruction of the plot by grub-seeking crows and busy golf course worker schedules.

The workshops consisted of an explanation and description of the reason for the experiment. We described the biology of the grubs and nematodes, assisted by a visual aid (nematode poster) published by Rutgers University. We then described the plot set up and participants were taught to sample for grubs using a 4" cup-cutter. Thresholds were demonstrated visually, and participants collected grubs for evaluation of the nematode experiment. Results were not as exciting as we had hoped. Only a few nematode-killed grubs were found. However we took the opportunity to teach grub identification and to explain why differences in species matters to a turf manager.

Impact: Although the experiment was not ideal, the interaction with school buildings and grounds staff was very positive. A total of seventeen workers were present at both workshops and all seemed very interested in the hands-on workshop. Many had never looked closely at a grub or thought about looking under the soil's surface to count them. Results from the survey were positive; all respondents were interested in more information or workshops about alternative, non-chemical pest control for athletic fields. Many were motivated to try nematodes because of the new regulations governing notification of pesticide use in schools, but many also said they would try nematodes at home for their grub-infested lawns.