Table 1. Survival of Japanese beetle grubs and plant parasitic nematodes in experimental plots four weeks after applying Heterorhabditis (HP-88) and Neoaplectana (NCA11) nematodes. Data in table are expressed as the mean of 3 replications per treatment.

Treatment	Initial number of grubs per ft^2	Final number of grubs per ft^2	Plant parasitic nematodes (stunt) per 50 cc soil
Daily irrigation + nematode treatment (HP88 + NCAII)	26	6.7	40
Daily irrigation + nematode treatment (HP88 + NCAII)	0	0	55
Daily irrigation control	0	0	117
80% PAN + nematode treatment (HP88 + NCAII)	26	2.7	47
80% PAN + nematode treatment (HP88 + NCAII)	0	0	38
80% PAN control	0	0	85
No irrigation + nematode treatment (HP88 + NCAII)	26	12.0	81
No irrigation + nematode treatment (HP88 + NCAII)	0	0	77
No irrigation control	0	0	39

Japanese beetle insecticide test

A grid of 3' x 3' plots separated by 1'-wide buffer strips was established in irrigated rough adjacent to a fairway at Rochester Golf Club in Rochester, Michigan. Six replications of 19 insecticide treatments were applied on September 15, 1988. Liquid products were applied with an R&D sprayer at 40 psi with an 80° LF3 nozzle. Insecticides were mixed in water and applied at a rate of 136 ml per 9.0 ft^2 (175 gal/A). Granular insecticides were applied with a hand shaker. Temperature at application time was 65°F with partly cloudy skies. The experiment was evaluated 22 days later (10-7-88) by digging 0.75 ft^2 sections from the center of each plot and examining thatch and soil for live grubs. This test was on Kentucky bluegrass with 1/4"-thick thatch layer and sandy loam soil.

All insecticide treatments except RH5849 at 0.5 and 1.0 lb ai/A, Diazinon Ag 500, and AC 299 486 at 7.0 and 5.0 lbs ai/A significantly reduced the number of grubs per plot compared to control plots. Diazinon Ag 500 was mistakenly applied at 4.0 oz/1000 ft^2, slightly lower than the recommended rate of 4.6 oz/1000 ft^2. Dylox 5 G and 80 SP, Sevin 4SC, Sevimol and Mocap 5G and 10G were highly effective against Japanese beetle grubs in this test. AC 290 713 and AC 290 230 showed a good rate response with the higher rates (7.0 lb ai/A) providing good control of grubs. RH 5849 worked better at higher application rates with the highest rate (2.0 lbs ai/A) also providing good control of grubs.

Conclusions

- Dylox 5 G, Sevin 4 SC, Sevimol 4 SC, Mocap 5 G, Mocap 10 G, and Dylox 80 SP provided good control.
- Phytotoxicity observed in Mocap treatments, particularly if it is not applied evenly.
- RH 5849, an insect growth regulator (IGR), has excellent potential.
- AC 290713 and AC 290230 have good potential for development into commercial products.
- Add Dylox 5 G to list of best products for grub control: Oftanol, Triumph, Turcam, and Proxol. Also -- Sevin is a good alternative because dermal and oral toxicity is considerably lower than the other products listed.

Japanese Beetle Larval Control
Rochester Golf Club, Rochester, MI
1988

Treatment	Rate (lbs ai/A)	Mean[1] number of grubs per square foot
Dylox 5G	8.0	1.8 a[2]
Sevin 4 SC	8.0	2.0 a
Sevimol 4SC	8.0	2.2 a
Mocap 5G	5.0	2.7 ab
Mocap 10G	5.0	2.9 abc
Dylox 80 SP	8.0	3.1 abc
AC 290 713	7.0	3.5 abc
AC 290 230	7.0	4.0 abc
RH 5849 + Triton	2.0 + 5.6 oz	4.7 abc
AC 290 713	3.0	4.7 abc
AC 290 230	3.0	5.1 abc
AC 290 230	5.0	5.5 abc
AC 290 713	5.0	6.0 abc
RH 5849 + Triton	1.0 + 5.6 oz	6.7 abcd
AC 299 486 3G	5.0	8.0 abcd
RH 5849 + Triton	0.5 + 5.6 oz	8.2 abcd
AC 299 486 3G	7.0	9.3 bcd
Diazinon AG 500	5.5	9.5 cd
Control	---	12.4 d

[1]Mean of six replications.

[2]Treatments followed by the same letter are not significantly different at P = .05, Duncans multiple range test.