working threshold because the turf will remain green and appear to be healthy, even with 20 grubs per square foot, as long as it is not severely water stressed. More research is necessary to determine thresholds for water stressed turf.

EUROPEAN CHAFER TEST

(Table 1) A grid of 3 ft x 3 ft plots separated by 1 ft wide buffer strips was established at Blythefield Country Club in Belmont, Michigan. The plots were established on irrigated rough with sandy soil. Each insecticide treatment was replicated six times. Granular insecticides were applied with modified "salt" shakers. Insecticides were mixed with 1500 ml of water and applied at a rate of 137 ml/9ft^2 (175 gal/acre) with single nozzle, hand-held wand CO_2 sprayer from R&D Sprayers. The application was made at 50 psi through an 8003 flat fan nozzle.

Several of the NTN 33893 treatments were applied in June and July prior to egg laying, and the rest of the treatments were applied to second and third instar grubs in August. All treatments were applied between 10:00 AM and 12:30 PM. The entomophagus nematodes from Biosys and the Triumph treatment were applied while the grass was wet with dew, then hand irrigated with ¼" of water applied through a watering can immediately after application. European chafer larvae were counted on September 16 by removing a 14 in x 14 in area from the center of each plot.

All of the insecticide treatments and none of the nematode treatments reduced the number of European chafer larvae compared with the control (Table 1). NTN 33893 applied in June or July as a granular or flowable formulation provided the best control (0.0 to 1.2 grubs per sample). Mocap and Dylox were also very effective (1.0 and 2.2 grubs per sample, respectively) compared with the control treatment (15.8 grubs per sample) but not as effective as when it was applied in June or July. Lesco 19299 and 19312, Sevin 7G, Triumph, and Sevimol also reduced the number of grubs per sample (5.3, 5.5, 7.8, 8.0 and 10.2, respectively) when compared with the control treatment (15.8, Table 1).

ANT TEST

(Table 2) 12 ft x 12 ft plots (144 ft^2) separated by 3 ft buffer strips in a fairway infested with ants at the Ionia Golf Club in Ionia, Michigan were used for this test. Treatments were applied July 25. Each treatment was replicated six times. Plots were sprayed with an R&D hand-held boom sprayer with four 8006 nozzles at 50 psi for 24 s (to give 4 gal/1000 ft^2). Granular products, which had been pre-weighed, were applied evenly throughout the plots with custom-made hand shakers. The fairway was irrigated 3-5 times per week depending on rainfall. Active ant mounds were counted just prior to insecticide treatment and once per week for 5 weeks afterward. Ant mounds were counted from a standing position.

Before insecticides were applied, all treatments had a similar level of ant activity (56-74 mounds per 144 ft^2, Table 2). Dursban 1G, Dursban 4E and Pageant ME20 reduced the number of ant mounds by 88-95% at one wk after treatment. After five weeks, the same treatments still provided ant control, but at a lower level (53-65% reduction). Orthene 5G at 3.0 lb AI, Orthene 5G at 1.0 lb AI and Orthene 76.1 S at 1.0 lb AI reduced ant mounding for 3, 2 and 1 weeks, respectively, after treatment. The greatest level of control for any Orthene treatments was a 64% reduction one week after treatment with Orthene 5G at 3.0 lb AI (Table 2).

CHINCH BUG TEST

(Table 3) A grid of 3 ft x 3 ft plots separated by 2 ft wide buffer strips was set-up in a home lawn with an infestation of chinch bugs in Okemos. Chinch bugs were counted in each plot on July 10 before insecticides were applied. Counts were made by observing each plot for a timed one minute period. The treatments were blocked out based on these counts. Afterward, six replications of each treatment was applied on July 10 between 10:00am and 3:30pm. The temperature when treatments were made was 85° - 90°F with a 0-5 mph wind. Granular products were evenly applied over the plot with hand-held shakers. Liquid products were applied with a single nozzle, hand-held CO_2 sprayer

Table 1. Insecticides tested for control of European chafer grubs at Blythefield Country Club in August and September, 1991.

Treatment	Rate	Date applied	n	Mean number of grubs per 1.4 sq ft
NTN 33893 240F	0.335 lb AI/acre	3 Jun	6	0.0 a
NTN 33893 0.5G	0.25 lb AI/acre	15 Jul	6	0.3 a
NTN 33893 0.5G	0.375 lb AI/acre	15 Jul	6	0.5 a
NTN 33893 0.5G	0.375 lb AI/acre	3 Jun	6	0.5 a
Mocap 10G	5.0 lb AI/acre	18 Aug	6	1.0 ab
NTN 33893 0.5G	0.25 lb AI/acre	3 Jun	6	1.2 abc
Dylox 6.2G	8.0 lb AI/acre	18 Aug	6	2.2 abc
NTN 33893 0.5G	0.375 lb AI/acre	18 Aug	6	3.8 abcd
NTN 33893 0.5G	0.25 lb AI/acre	18 Aug	6	5.0 bcd
Lesco 019299	4.0 lb AI/acre	18 Aug	6	5.3 bcd
Lesco 019312	4.0 lb AI/acre	18 Aug	6	5.5 cd
Sevin 7G	8.0 lb AI/acre	18 Aug	6	7.8 de
Triumph & 1/4" Irrigation	1.5 lb AI/acre	18 Aug	6	8.0 de
Sevimol 4SC	8.0 lb AI/acre	18 Aug	6	10.2 e
Control for chemicals		--	6	15.8 f
Biosys #2	5.0 million flowable	18 Aug	6	12.7 a
Biosys #27	15.0 million flowable	18 Aug	6	17.3 a
Control for nematodes		--	6	17.8 a

Treatments followed by the same letter are not significantly different (P = 0.05, Tukey's HSD)