

This discrepancy between a small need for insecticides and the large use of insecticides (over 12 million dollars of product per year) points to the need for an educational program in turfgrass integrated pest management (IPM) where thresholds and alternatives are discussed. The undesirable effects of insecticides may outweigh the benefits in many cases. This means that most of the insecticides applied to Michigan turf may be unnecessary.

IMPACT OF INSECTICIDES

- Effect on wildlife
- Exposure to people and pets
- Risk to applicator
- Runoff to streams and ponds
- Risk of groundwater contamination
- Destruction of predators and parasites
- Suppression of decomposers (thatch)

Just one effect alone, the suppression of decomposers, and the resulting build-up in thatch may be a good reason to avoid unnecessary insecticide applications. However, other reasons are important too even though the effects may be difficult to see. The impact of insecticides on wildlife is an important consideration. Almost every insecticide used on turf has an impact on wildlife (Table 2). What is needed at this time is an IPM approach to turf management that stresses growing healthy turf that is capable of compensating for insect injury. One important aspect of an IPM program is correctly diagnosing turf problems and assessing the potential for damage. Thresholds are used as guidelines for decision making. For example if more than 20 chinch bugs are found in two minutes of searching some damage may occur to those parts of the lawn. Unfortunately, the concept of thresholds is complicated by the vast differences in turf maintenance practices. Highly maintained turf has a great ability to recover from insect injury, while low maintenance turf may not recover as well. Research has demonstrated that irrigated turf can withstand a greater number of grubs per square foot than non-irrigated turf. The suggested threshold for Japanese beetle grubs for irrigated turf is about 30 per square foot while the threshold for non-irrigated turf is 10-15 per square foot. The different thresholds are necessary because grub injured turf is much more susceptible to water stress. One way of thinking about grub injury to turf is to compare it with new sod. New sod is similar to turf heavily injured by grubs. It will not show symptoms of stress if it receives daily irrigation. The same type of response can be expected from grub injured turf.

1990 Entomology Research

One of the greatest needs at this time is better threshold information for use in turf IPM. In 1990, we initiated a project designed to define thresholds for grub injury to turf and how these thresholds are effected by irrigation practices. Part of the confusion for turf managers is that root-pruning injury may not be expressed as visible symptoms. The blades may remain green and apparently healthy even when the root system has been seriously injured by grubs. In our experiment we placed 0, 10, 20, 30, 40 or 50 grubs per square foot into bluegrass sod grown in rooting boxes at the Hancock Turf Research Center. The turf was allowed to establish for 6 weeks before grubs were added in September. The rooting boxes were pulled up in early November and the damage to turf roots quantified by measuring root strength.

In initial tests this year the rooting boxes worked well as a method of evaluating root damaged caused by grubs. A strong negative correlation was found between the number of grubs per square foot and root strength. (Figure 1B). Preliminary results suggest that grub damage to irrigated turf is not visible unless the grub infestation exceeds 30 per square foot (Figure 1B). However, injury could be expressed as patches of brown or dead turf if the turf is water stressed. No correlation was found between percent brown or dead turf and the number of grubs per square foot (Figure 1A). This is expected for irrigated turf and supports the initial hypothesis that some kind of root strength parameter is needed to evaluate grub injury.

ANT CONTROL IN TURFGRASS: 12' x 12' plots (144 ft²) with 3' buffer strips were established in a heavily infested fairway at the Ionia Country Club in Ionia. Treatments were applied on 15 Aug. Each treatment was replicated 6 times. Plots were sprayed with a R&D hand-held boom sprayer with four 8003 nozzles at 50 psi for 66.4 s (to give 4 gal/1000 ft²). Granular products were applied with custom-made hand shakers designed to require 3-4 trips over the entire plot area to evenly apply the amount of pre-weighed product. Ant mounds were counted just prior to insecticide treatment and once per wk for 5 wks afterwards. Ant mounds were counted if they could be seen while standing upright.

At 3 and 4 wks after treatment, only Triumph 4E significantly reduced ant mounding in comparison with the control. At 1 and 2 wks after treatment all insecticide products reduced mounding except for Pageant DF. None of the products tested were effective 5 wks after application. (Table 3)

Figures 1 A, B. The relationship of grubs per square foot of turf to visual ratings (A) and actual turf injury as measured by pounds of pull necessary to lift rooting boxes (B).

