

1990 Entomology Research Report

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Turf Insects 1990 Adequate rain throughout the season allowed turf to quickly recover from insect injury. The number of reports of extensive injury from turf insects was down this year compared with previous years. This supports the idea that well managed turf in Michigan does not suffer from insect attack and does not need preventive insecticide applications. Some observations and trends for specific pests are listed below.

Golf Courses

Japanese Beetle	Increased activity at some golf courses in southeast and southcentral Michigan. Damage from skunks searching for grubs was common.
European chafer	Continues to be a problem for some golf courses in Detroit and Grand Rapids area. This grub has spread to some new golf course locations in Oakland County.
Turfgrass Ataenius	Continues to be a problem for about one in five golf courses throughout Michigan. In some places extensive root damage in early July caused mowers to skid on hillsides.
Cutworms	A common midsummer problem on golf course tees and greens throughout the state.
Ants	Mostly a problem on tees and greens of golf courses with sandy soil. In some locations mounding was a problem on fairways.

Home Lawns

Chinch Bugs	Damage from chinch bugs was reduced in 1990 compared with 1988 and 1989. Chinch bug populations crashed in some areas because of Beuveria activity (a fungal pathogen of chinch bugs).
Bluegrass billbug	As in past years a small amount of billbug damage could be found nearly everywhere, but large patches of dead grass were uncommon.
Japanese beetle	Spread to new areas in Wayne and Oakland counties. More problems from Japanese beetle grubs were reported this year than in previous years.
European Chafer	Continues to spread among home lawns in the Detroit and Grand Rapids areas.

Recent Studies

- Perennial ryegrass resistance to chinch bugs USDA Beltsville. Endophyte based resistance causes ryegrass cultivars to vary from susceptible to resistant. Pennant, Regal, Citation II and Repell are among the most resistant cultivars.
- A microsporidium infection of Japanese beetle. Connecticut Ag. Exp. Station. Increased levels of infection of Japanese beetle by Ovavesicular popillae and Bacillus popillae coincided with Japanese beetle population decline.
- Billbug turf pests. Rutgers University. There are at least 4 species of billbugs in Michigan. Billbugs probably cause more damage than is realized. Turf resistance is important.
- Effect of pesticides on earthworms. University of Kentucky. One application of benomyl suppresses earthworms 60-99%, lasting 20 weeks. Diazinon, isofenfos, trichlorfon, chlorpyrifos and isazofos also cause earthworm mortality. Use of these pesticides causes an increase in thatch.
- Effect of isofenfos on beneficials. Ohio State University. Populations of springtails (Collembola) and rove beetles (Staphylinidae) were suppressed for 40 weeks. These are decomposers and predators.

The last two studies provide evidence that insecticides are destructive to beneficial insects and earthworms, and may contribute to thatch build-up. It is becoming increasingly clear that we should not use insecticides on turf unless insect pests are causing an unacceptable amount of damage.

After insect injury is correctly diagnosed, spot treatments of insecticide can be applied to infested areas rather than a general application to the entire lawn.

Recent studies suggest that insecticides are rarely needed on cool season turfgrass, yet Michigan residents continue to apply a large amount of insecticides (Table 1).

Table 1. INSECTICIDE USE ON MICHIGAN TURF*

Site	Cost of insecticide products applied in 1988 (not including labor)
Home lawns	\$8,631,000.00
Lawn care companies	3,118,000.00
Golf courses	829,000.00
Hospitals	135,000.00
Schools	104,000.00
Parks	75,000.00

*1988 statewide survey by Trendfacts Research and MTF.

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.