

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.

Table 1. Insecticides commonly used on turfgrass for insect control and their effects on wildlife. This information was compiled by extension specialists at Iowa State University.

Chemical name	Some trade names	Chemical group*	Effect on wildlife
Diazinon	Diazinon, Diazol, Gardentox, Spectracide	OP	Very highly toxic to birds and fish; moderately toxic to mammals
Chlorpyrifos	Dursban, Lorsban, Eradex, Killmaster	OP	Highly toxic to birds and fish; moderate to low toxicity to mammals
Carbaryl	Devicarb, Karbaspray, Sevin	C	No observed death in birds and mammals, but some reduced populations; highly toxic to fish
Isophenphos	Oftanol	OP	Highly toxic to birds, moderate to low toxicity to mammals
Trichlorfon	Chlorophos, Dylox, Tugon	OP	Very highly to highly toxic to birds; highly to moderately toxic to mammals; increases the toxicity of Malathion
Ethoprop	Ethoprophos, Mocap, Prophos	OP	Very highly to highly toxic to birds and mammals
Tempo	Cyfluthrin	P	Very highly toxic to fish; low toxicity to birds and mammals
Triumph	Izasophos	OP	Very highly toxic to fish and birds; moderate to low toxicity to mammals

* OP = organophosphate
 C = carbamate
 P = synthetic pyrethroid