

Principles and History of Integrated Turfgrass Pest Management

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The importance of developing efficient and environmentally sound methods for managing turfgrass pests was reemphasized in the late 20th century by concerns about environmental safety, the loss of traditional long-term residual insecticides, and a growing awareness of the problems associated with the overuse of pesticides. Integrated pest management (IPM), or integrated turfgrass management, addressed these concerns while maintaining the aesthetic and utilitarian qualities of the turf. IPM uses all suitable methods and techniques in a compatible manner to maintain pest densities below levels that cause unacceptable damage. Although insects and mites are discussed in this handbook, the same management principles apply to other turf problems such as diseases and weeds.

Historically IPM has been discredited by some people who believe it to be a completely nonpesticidal approach, and others who consider it a cover for using pesticides indiscriminately to do “business as usual.” IPM, when practiced properly, is neither. There is a continuum, and high-level progressive IPM practitioners can greatly minimize or even eliminate the use of traditional pesticides. Another myth is that IPM is step along the way when transitioning to organic. Actually, the principles of IPM underlie all good pest management and should be applied whether one is managing without pesticides or with a full palette of available chemical interventions.

Inherent in the IPM philosophy is the recognition that, for most pests, infestation levels exist that can be tolerated without substantial plant injury. Eradication of pests is not attempted because moderate pest levels help maintain natural enemies, and overuse of chemicals can lead to pesticide resistance and harmful effects on human health and the environment. An overriding objective of IPM is to optimize and diversify pest control strategies. The selection of management strategies varies depending on site requirements, changes as new practices and products become available, site policies, and the preferences of man-

agers and site users.

IPM emphasizes planning ahead to avoid or minimize future pest problems. Decisions made during the establishment and maintenance of a turf area can substantially influence pest development. Among these key decisions are selection of turfgrass species and cultivar, weed and disease control strategies, irrigation, fertilization, thatch management, and other cultural practices that affect the health and vigor of the turfgrass. As a general rule, stressed or poorly maintained turf exhibits pest damage sooner than healthy turf and is slower to recover after insect or mite injury.

Despite appropriate measures to avoid or reduce insect problems, pest populations may increase under certain conditions. When using IPM, control measures including conventional pesticides are usually used only when pest numbers reach or threaten to reach predetermined levels (treatment thresholds). These thresholds are flexible guidelines that are defined in terms of the level of insect abundance or damage that can be tolerated before taking action. They are based on several variables including pest species, abundance, and life stage; variety, vigor, and value of the turfgrass; relative effectiveness and cost of control measures; and time of year. Treatment thresholds are not hard rules that apply to every situation; but when used conscientiously, they should help turfgrass managers make effective pest management decisions.

Occasionally, a turfgrass manager may decide to treat preventively. This is still considered good IPM if historical records suggest that a specific site or area is likely to be infested and damaged under the current or expected weather conditions, and if a preventive treatment would be more effective and/or less harmful to the environment than a curative treatment.

Implementing an IPM Program for Turfgrass Insects

Establishing a pest management program requires a sound understanding of the growth habits and cultural requirements of the turfgrass; knowledge of the biology, behavior, life history, and type of damage caused by potential pests; and information about the time of year, growth stage of the turfgrass, and environmental conditions under which pest damage is most likely to occur. Accurate pest identification is also essential. Managers must become familiar with the pest species that occur in their area. Knowledge of pests' life cycles and a familiarity of local landscape and environmental conditions generate an awareness of what pests may be present or threatening at