"Integrated Pest Management Overview"

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After the adoption of the School Integrated Pest Management Act by the State of New Jersey in December 2002, many questions have been raised concerning the definition of integrated pest management (IPM) and the specific practices and pest control measures that constitute an IPM program.

What is IPM?

Numerous University fact sheets and textbooks have been devoted to defining IPM and instructing sports field managers how to implement an IPM program. There are several common themes that are consistent throughout these numerous resources.

First, IPM attempts to reduce the risk that pest control strategies may have on the environment and people by incorporating all suitable techniques to maintain pests within acceptable limits. Several such techniques include pest scouting, monitoring and record keeping. Making an effort to carefully and routinely scout, monitor, and create records of areas where pest populations have been historically problematic will allow sports field managers to limit the implementation of pest control measures to only those specific problem areas and not to those areas where pests are not a problem.

Secondly, IPM *does not* entail the elimination of pesticide use. A successful IPM program will limit the amount of pesticides applied by using pesticides in a more efficient manner. While scouting, monitoring, and record keeping can help achieve this goal, the implementation of cultural practices that promote healthy turf can also reduce the amount of pesticides needed to solve pest problems. Simple changes in irrigation scheduling, fertilization, and mowing frequency and height can help reduce the incidences of pests and the need for pesticides applications, which consume human and financial resources.

IPM for athletic fields

Given the inherent functional use of athletic fields, and in many cases, the overuse of these fields leading to poor turf quality, some sports turf managers may view IPM programs and subsequent reduced pesticide use as unrealistic and unattainable goals. However, if implemented properly, IPM methods can potentially enhance turfgrass quality and improve sports turf playability.

Scouting, monitoring, and record keeping

The process of scouting and monitoring can take-on many forms for a sports turf manager. For example, yearly soil testing can be conducted on fields that are intensively maintained and are highly visible. While frequent soil testing is always a good idea, fields that are deemed to be less of a priority may only need to be tested every three years. Correct decisions can be made with regard to lime applications and specific nutrient requirements based on the results of soil tests. Note: A soil test will provide information pertaining to levels of macronutrients in soils including phosphorous, potassium, magnesium, and calcium and several micronutrients. However, the soil test will not provide information on existing nitrogen levels.

Understanding the lifecycles of various pests (and being able to correctly identify those pests) can help sports field managers predict when to begin monitoring for specific pests. Crabgrass is a summer annual weed and serves as an example of a pest which conforms to a yearly lifecycle. As a summer annual, crabgrass will germinate in the spring (South Jersey: after April 10; Central and North Jersey: after April 20) and will set seed in summer and die in the fall from early frosts. Sports field managers should note heavy crabgrass populations in the fall and recognize that these fields will likely need to be treated with a preemergence herbicide the next spring if crabgrass control is a goal.

Conversely, in situations where a preemergence product has not been applied in the spring, and there is no presence of crabgrass throughout the summer and fall months, one could conclude that there is no significant crabgrass seed bank associated with the site. As an appropriate IPM strategy in this situation, a sports field manager might consider avoiding a preemergence application to the field in the next year. If crabgrass does become a problem later in the year, a postemergence crabgrass herbicide may need to be applied.

As part of record keeping, sports field managers will find it useful to create maps or devise a numbering scheme to delineate between multiple fields. Updating these records and reviewing previous records throughout the season will make it easier to anticipate future pest problems.

For white grub control in sports turf, scouting, monitoring and record keeping can determine whether or not to apply an insecticide.

Continued on next page.....

Continued from page 4 "IPM".....

The label for the grub control product Merit® suggests basing application decisions on "historical monitoring of the site, previous records or experiences, and current season adult trapping or other methods."
Optimal grub control by the product results when the insecticide is applied prior to egg hatch. Thus, the monitoring of adult insect activity can play a key role as to if and when the chemical control is applied.

Cultural practices affecting pest populations

Turfgrass weed scientists will often say, "The best defense against weeds is a vigorous stand of turfgrass." Achieving an actively growing, healthy turfgrass stand is highly dependent upon employing proper cultural practices.

One of the most frequent cultural practices associated with sports field management (and seemingly the most mundane) is mowing. Simple changes in mowing height and frequency can impact the encroachment of weeds and insects.

A general mowing guide for moderately to intensively maintained turfgrass (such as athletic field turf) is to remove no more than 1/3 of the vertical shoot growth per mowing. Known as the "1/3rd Rule," this guide is widely accepted among sports field managers and researchers. Studies indicate that infrequently mowed turf is less dense than frequently mowed turf, allowing for "voids" in the turfgrass stand and potential sites for weed encroachment. Mowing frequency may need to increase in actively growing turf to adhere to the 1/3rd rule. IPM suggests that a turfgrass stand free of broadleaf weeds and crabgrass will not necessitate that application of postemergence herbicides for the control of those weeds.

Turfgrass species and cultivars within that species have a mowing height tolerance range that provides a satisfactory turf. When turfgrasses are mowed below their tolerance range (scalping), particularly during times of stress, turfgrass stands will tend to thin, and thus provide entrances for weeds to encroach.

When turfgrasses (particularly Kentucky bluegrasses) are mowed above their tolerance level, in combination with excessive water and fertilization, plant biomass production can exceed decomposition resulting in thatch – a layer of organic residue located immediately above the soil surface. An excessive amount of thatch (1/2 inch) can serve as a habitat for insects that feed on turf such as chinch bugs and white grubs. When chemical control of insects is necessary, thatch can bind insecticides and thus reduce their efficacy.

IPM resources

Rutgers Cooperative Extension has a number of IPM resources published on its website at: www.pestmanagement.rutgers.edu. For those sports field managers working at schools, there are links available on the website detailing the School IPM Act and a summation of the key requirements of the Act. There are also IPM Report Cards available for downloading that are meant to act as self-assessment guides for school grounds and sports field managers to determine if their current management regimes fall under an "IPM" plan. While the Report Cards are not hard-and-fast rules that require regulatory compliance, they do provide some useful ideas to implement in an IPM program at a given facility. ▲

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