



IPM Scouting for Golf Courses

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Integrated pest management (IPM) is a decision-making process. IPM programs use all appropriate and economical strategies to manage pests with the least disruption to the environment. Turfgrass IPM involves solid agronomic practices, monitoring, identifying pests, determining threshold levels, selecting management tactics and evaluating results. Establishing a pest management program requires an understanding of the growth habits and cultural requirements of turfgrass; knowledge of the biology, behavior, life history and type of damage caused by potential pests; and information regarding the time of year, growth stage of the turfgrass and environmental conditions conducive to the development of pest damage. Turfgrass managers must integrate cultural activities with insect, weed and disease management strategies.

Good agronomic practices and monitoring must be the foundation of any true IPM approach to managing pests. Monitoring is a systematic method of inspecting turfgrass for pests and cultural problems. The primary goal of monitoring - scouting - is to locate, identify, rank and record pest infestations and their impact on turfgrass health. Scouting on a regular basis provides timely information on pest density and activity, and turfgrass tolerance. Pest management decisions, timing and control actions are supplemented by the scouting data collected. Continuous monitoring is the best method for checking the effectiveness of control strategies.

When Should Scouting Begin?

NOW. No matter if it's April, August, or if it's winter and you are reading this report because you missed this stop at the MSU field day, it is always a worthwhile time to scout. Scouting typically begins at the start of the growing season although useful information about your site can be gathered and evaluated year 'round.

An effective scouting program requires a commitment to "*Just do it.*" Monitoring is most likely to be accomplished if a person(s) is designated and trained to scout the golf course on a regular basis. Monitoring should be the paramount job of the scout. A scout's responsibilities include, but are not limited to, the following:

- 1) Monitoring the turfgrass for insects, plant diseases and weed infestations on a regular basis. Cultural concerns may also be documented.
- 2) Recording the findings on field data sheets.
- 3) Diagnosing problems and rating severity based on diagnosis, priority of the site, and turf value.
- 4) Assessing the efficacy of pest control measures.
- 5) Reporting the findings to decision makers.

Scouting

To provide the scout with insight into site specific conditions, the season starts with an in-depth interview and tour of the golf course with the golf course superintendent. Discussing and focusing on the course in sections, for example one hole at a time, is helpful for gathering and categorizing information.

Subdividing each hole into pest management units (PMU) such as tees, fairways, greens and rough helps to prioritize and record the cultural and pest management activities that are devoted to each of these unique areas. Useful information that needs to be shared with the scout includes:

- Determining the predominant turfgrass species on tees, greens, fairways and roughs.
- Previous insect, disease and weed infestations and locations.
- Management strategies for controlling the above.
- Cultural practices, i.e., fertility, irrigation, use of wetting agents, topdressing, etc.
- Soil types and depths, especially on greens and tees.
- Cultural problems, i.e., drainage, air circulation, root competition, compaction, other.

Scouting should be done routinely throughout the season, at least once per week. At certain times of the season, it may be best to scout two, three or more times per week. Monitoring data can be used to limit pesticide applications only to those areas where pests are currently active. A communication system between the scout and the superintendent must be established. Much of the communication is written. Keeping scouting summaries in a notebook located in a central and convenient spot works well.

Tools. Scouts should have most, if not all, of the following items with them or they should be readily accessible: pen, clipboard and field sheets for recording observations, 10X hand lens, soil probe, knife, cup cutter, collection vials, freezer strength plastic bags for samples, disclosing solution, reference materials, sunscreen and an open mind.

Procedures. During the weekly scouting event, the tees and greens are walked in a pattern so that the entire area is examined. This may be a zigzag or a circular pattern. A golf cart is driven down the fairway in a zigzag pattern. The scout gets off the cart when a problem is observed and closer examination is required. Conditions noted include dryness, color, thatch, lesions, wilting, excessive water, fungal growths, turf species affected, insect, weeds, soil temperatures, etc. All pertinent information is recorded on a weekly field sheet. A sample field sheet is shown in Figure 1. Notes recorded from previous weeks can be easily referenced. This helps document the changes in turf conditions. As you develop your scouting program, focus your attention on the areas of the golf course that perennially suffer specific pest problems. Management efforts often can be concentrated in these indicator areas, thus avoiding broad preventative applications.

Weeds. A detailed weed map is created in the spring and may be updated in early summer and again in early fall. A generic map can be used, but an actual map of the golf hole is more useful. Weeds that appear on the tees and greens are usually noted in the weekly report, too. Record the species, where they occur, and the density of the infestation.

Insects. Successful management of most turf insects depends on early detection. Among the more common symptoms of insect-damaged turf are a general thinning of the grass, spongy areas, irregular brown patches and/or plants that easily break away at soil level. Confirming that insects are causing the problem may be difficult, however, because many of the symptoms described above could be caused by other factors such as heat or drought stress, gasoline or hydraulic fluid, fertilizers, herbicides or insecticides, or scalping during mowing operations. If the problem is insect-related, a close visual inspection of the damaged area should reveal either the presence of the pest or indirect evidence that an insect infestation was present. Quantify the number of insects or damage per square foot, the insect species and its developmental stage (instar, pupae, adult). Specific sampling techniques and thresholds can be used for certain insects such as cutworms, white grubs and chinch bugs. A few of these techniques are described below:

Flotation can be used for chinch bug detection. In areas where you suspect an infestation, insert a metal cylinder (preferably 8-9" diameter) into the ground (1-2"). A coffee can with both ends cut out works well. Fill the cylinder with water and watch for chinch bugs floating to the surface in about 5-15 minutes. A damage threshold may be reached when 20 chinch bugs per 9" cylinder are present.

Disclosing solution. By mixing 1-2 tablespoons of liquid soap in a gallon of water and pouring it over 1 square yard of turf, you can irritate many soil inhabiting insects causing them to come to the surface for you to

count. Webworms, cutworms, armyworms and beetles are among those that become irritated and will surface within 5 minutes. A threshold of 15 caterpillars per square yard can be used as a damage threshold for webworms.

Cup cutter sampling works well for scouting for white grubs. A standard gold course cup cutter removes 4" soil cores that can be quickly inspected for grubs and then replaced. General grub thresholds can be found in Table 1.

Table 1. General Grub Thresholds.

	<u>Per square foot</u>	<u>Per 4" cup cutter core</u>
<i>Aphodius</i>	50+	5-8
<i>Ataenius</i>	50+	5-8
European chafer	5-7	any
Japanese beetle	8-10	any

Disease: Weather reports and disease prediction models are helpful for alerting the scout to conditions conducive to disease development. Diagnostic kits can help confirm identification of disease organisms when symptoms are present. Confirmation with a diagnostic lab is valuable for treating the disease correctly. Awareness and monitoring of 'hot spots' helps to be prepared for future outbreaks. Quantify areas affected, identify the disease (if possible) and rank its severity (low, medium, high) and whether it is active or inactive.

If possible, it is beneficial to revisit problem areas between weekly scouting and determine whether the problem is increasing or decreasing. If any pest control actions have been taken (i.e., pesticide application) check for efficacy.

Records Scouting activities are useless unless they are recorded. The superintendent should keep detailed records of all cultural and chemical management practices and make them available to the scout. This will help assess current turf problems and aid in future decisions. In turn, the scout must provide the superintendent with a summary of all pertinent information. Summaries usually are not as detailed as the scout's field sheets. A summary sheet is shown in Figure 2.

Why Scout and Keep Records? A structures monitoring program serves as a foundation for an integrated turfgrass management program. While instituting a monitoring program may not always reduce chemical applications, it will assure more judicious use of pesticides. The efficacy of chemical controls is documented and will become a reliable source of information needed to make future purchasing decisions. Several years

of compiled data will suggest pest threshold numbers specific to your site conditions, which will further improve future control decisions. Biorational pesticides targeted at the pest as it exists at your site, can reduce the negative impacts on beneficial organisms. Furthermore, tracking all your inputs and how cultural/mechanical practices influence turf health and vigor can help fine tune your management activities.

Finally, adopting a monitoring program as the base of an IPM program will improve your image as a professional and demonstrate your genuine concern for the environment.

REFERENCES:

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