



Turfgrass Integrated Pest Management

Turfgrass Integrated Pest Management (IPM) is not a predetermined set of practices, but is a stepwise process for improving management of pests in turfgrass areas. This process, which is prescriptive to the site and school district, focuses on long-term prevention or suppression of pest problems with minimum impact on human health and the environment.

Implementing an IPM program for school turfgrass areas requires an active, working relationship between the IPM coordinator, school administrators, and those persons responsible for turfgrass care. It also involves developing management actions that are appropriate for the intended function of a given turfgrass area. The question should be asked; are the weed disease and insect problems affecting the function of the specific turf area?

The suggested essential criteria of a turfgrass IPM program for Iowa schools are as follows:

- **MAPPING.** Grounds for each school property should be mapped to depict:
 - Overall grounds (buildings, playgrounds, athletic fields, other turfgrass areas, sidewalks, and parking lots)
 - Athletic fields (football, soccer, baseball, track, practice, etc.)
 - High visibility areas
 - Other areas (open courtyards, special gardens, etc.)

These maps should be drawn to scale and overlaid with an identifying grid.

- **CLASSIFYING.** The school IPM coordinator and administrators should use the maps and classify each turfgrass area into one of following categories according to maintenance level. The IPM program will vary depending on the care desired for each area.
 - Highest care – varsity and practice athletic fields
 - High care – multipurpose fields, playground fields, high-visibility grounds
 - Moderate care – common grounds areas, low use areas
 - Lowest care – utility areas, slopes, ditches; natural areas; fence lines; property lines

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- **SETTING ACTION THRESHOLDS.** Turfgrass maintenance and school personnel need to set action levels for potential pests before sampling begins. This will allow rational, objective decision-making when pests are found on school properties. These thresholds should be set from research-based studies (as available) by university and industry turfgrass specialists. Action thresholds should incorporate factors such as severity of pest problem, impacts on human health and safety, economic considerations, and aesthetics.
- **CUSTOMER INVOLVEMENT.** The school district must agree to actively participate in the turfgrass IPM process. Key items involving the school are following irrigation instructions, proper mowing, and notifying the IPM coordinator of any plant or pest problems.
- **MONITORING AND PEST IDENTIFICATION.** Turfgrass areas should be visually inspected for the presence of pests at appropriate times during the growing season. The number of inspections in the highest-care areas will be more than in lowest-care areas. Methods of sampling for specific turfgrass pests are determined on criteria for each discipline (weed science, plant pathology, entomology); see reference list for details.
 - An initial site inspection should be conducted for each turfgrass area prior to the growing season. Key turfgrass species, key pests, and key locations should be identified on maps. The use of each area and current traffic patterns should also be noted.
 - Initial soil samples should be taken for each area (moderate- and highest-care) before the growing season begins. Samples should be analyzed and interpreted by a laboratory to provide recommendations for fertilizer and soil amendments.
 - A minimum of two additional monitoring service calls should be scheduled over the first year. Three to five inspections are suggested for each subsequent year of service. Monitoring should include a record of plant stress, environmental concerns, customer involvement, turfgrass pest densities, and natural enemies present.
 - Turfgrass maintenance personnel will collect appropriate samples of unknown pests and forward these to a diagnostic laboratory for identification.
- **MANAGEMENT RESPONSE.** Management strategies will be selected based on monitoring results and the nature of the problem. A schedule for school turfgrass maintenance is given in the accompanying table. Management actions could involve one or more strategies including
 - Cultural methods – use of other turfgrass cultivars; overseeding; altering watering, mowing, or fertilizing practices.

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- Physical and mechanical methods – removal of thatch; aeration; individual removal of pests (as practical).
 - Biological controls – use of bacteria, fungi, insects, nematodes, or viruses to control turfgrass pests.
 - Pesticide use – if any insect, disease or weed problems develop or expected to develop that meet or exceed the predetermined action threshold values and nonchemical methods were not effective, pesticides can be used in a judicious manner following label instructions. Pesticides should not be used solely as insurance against possible future turfgrass problems. Preventative pesticide applications should be based on site specific pest problems that have been documented the previous year. White grubs and crabgrass are two major pests in Iowa that are more effectively controlled preventatively, however they can also be controlled by curative methods if needed. A control strategy needs to be defined for these two important pests. Spot treatments should be preferred to broadcast applications whenever possible. All treatments should be made using appropriate drift reduction techniques. Signs must be posted during and following the application as per state law.
- **EVALUATE EFFORTS.** After any type of management strategy, turfgrass areas should be inspected for results at intervals appropriate to the type of strategy. This information should be combined with other monitoring records and observations from school personnel to determine the effectiveness of the effort. After several seasons of a turfgrass IPM program and tracking financial records, the long-term success of the program can be assessed.
 - **RECORD KEEPING.** Compile a site-specific history of monitoring records, pest infestations, management strategies, evaluation records, and feedback from school personnel. These data may be helpful in predicting future pest occurrence, fine-tuning action thresholds, and permit early intervention once pests reach action thresholds. It is important to keep a separate record of all chemical products used on school properties, including pesticides and fertilizers. These records should be kept for at least 3 years and be made accessible to all interested persons.

There are several important sources of information for the turfgrass IPM practitioner. These include the following references:

- Generic Football Field Maintenance Program. Minner D, ISU Horticulture. <http://turfgrass.hort.iastate.edu/extension/football.pdf>
- *Integrated Turfgrass Management for the Northern Great Plains*. 1997. Baxendale F and Gaussoin R. Institute of Agriculture and Natural Resources, University of Nebraska, 236 pages.

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- *Handbook of Turfgrass Insect Pests*. 1995. Brandenburg R and Villani M. The Entomological Society of America, 140 pages.
- Turf cultural management. The IPM Institute of America.
http://www.ipminstitute.org/school_grounds_turf.htm
- Wisconsin's School Integrated Pest Management Manual. 2000. Stier J, Delahut K, Pelliteri P, and Becker B.
<http://ipcm.wisc.edu/programs/school/>
- IPM for Schools: A How-to Manual. 1997. Daar S, Drlik T, Olkowski H, Olkowski W. U.S. Environmental Protection Agency, EPA 909-B-97-001 or
<http://www.epa.gov/region09/toxic/pest/school/>
- University Extension turfgrass specialists (entomology, horticulture, plant pathology, and weed science)
 - Turfgrass maintenance – Dr. David Minner, Horticulture, Iowa State University, 515-294-5726, dminner@iastate.edu
 - Disease concerns – Dr. Mark Gleason, Plant Pathology, Iowa State University, 515-294-0579, mgleason@iastate.edu
 - Insect concerns – Dr. Donald Lewis, Entomology, Iowa State University, 515-294-1104, drlewis@iastate.edu
 - Weed concerns – Dr. Robert Hartzler, Agronomy, Iowa State University, 515-294-1923, Hartzler@iastate.edu