



CGSA Policy Paper Concerning the Use of IPM to Manage Golf Courses

Golf course management involves the provision of golf course conditions that are consistent from hole to hole on any given golf course. These conditions are achieved and maintained through the implementation of an Integrated Pest Management Plan. Integrated Pest Management (IPM) is a decision-making process that uses all necessary techniques to suppress pests effectively, economically and in an environmentally sound manner. Within the IPM framework or toolbox are a number of options from which the superintendent may choose when managing the golf course property.

Integrated Pest Management (IPM) is an approach for planning and managing a site to minimize pest problems and to assist in decision-making about when and how to intervene when pest problems occur. It is a sustainable approach, combining biological, cultural, physical, and chemical methods to manage pests so that the benefits of pest control and turf health are maximized and the health and environmental risks are minimized. A key initiative in IPM is to take action against pests only when their numbers or effects warrant it, rather than as a routine measure. IPM extends far beyond the use of pest control products, whether chemical or “alternative,” and can include a wide variety of prevention and treatment techniques. IPM reduces reliance on pesticides as the sole approach to pest management. IPM is a system designed to keep pest damage within acceptable levels. For a golf course, acceptable levels can be defined as the number of pests or the amount of damage by pests, beyond which the aesthetics of the course and the playability of the turfgrass are compromised. It should be emphasized that IPM is not pesticide free turfgrass management. IPM should however result in more efficient use of pesticides.

The CGSA supports the following protocols and practices related to integrated pest management:

- Through regular monitoring and record keeping, identify the pest problem, analyze the conditions causing it, and determine the damage threshold level below which the pest can be tolerated.
- Devise ways to change conditions to prevent or discourage recurrence of the problem. Examples include: utilizing improved (e.g., drought resistant, pest resistant) turfgrass varieties, modifying microclimate conditions, or changing cultural practice management programs.
- If damage thresholds are met, select the appropriate control strategies to suppress the pest populations with minimal environmental impact and to avoid surpassing threshold limits. Control measures include biological, cultural, physical, mechanical, and chemical methods. Biological control methods must be environmentally sound and should be properly screened and tested before implementation.
- Non-chemical and biological control measures should focus on practices such as the introduction of natural pest enemies (e.g., parasites and predators), utilizing syringing techniques, improving air movement, soil aeration techniques, and mechanical traps.

The CGSA also supports the following five steps to the implementation of an IPM program for a golf course:

1. The collection and understanding of course conditions and characteristics. This includes the collection of information on existing course conditions which could impact the ability of turfgrass to withstand pest infestation. This includes the collection of information on:
 - Inventory of turfgrass types throughout the course;



- Amount of shade present;
 - Density of ornamental plantings or other barriers which may restrict air movement;
 - Soil fertility;
 - Site drainage;
 - Current cultural practices (e.g. mowing, fertilization, irrigation, pesticide application, aeration, etc.) and;
 - Any other site conditions which could limit turf vigour, or promote the presence of a specific pest.
2. The surveying of pests at the golf course on an annual basis and keeping historical records. This component involves determining the identity, location and populations of the following pests:
- Weeds
 - Insects
 - Undesirable animals(eg: rodents)
 - Diseases

It may be necessary to retain the services of a biologist to assist with the identification of specific pests.

3. Defining pest response thresholds. Pest response thresholds are the levels of pest infestation (i.e. disease, insect or weed) which can be tolerated relative to course aesthetics and playability. Threshold levels can be very general (e.g. spraying for dandelions when they become noticeable visually), or quite specific (e.g. insecticide applications based on actual counts of insects).
4. Monitoring provides the information required to make decisions on pest management measures. Objectives of a monitoring program are as follows:
1. Determine the extent and nature of any turfgrass damage.
 2. Determine the presence and population of pests.
 3. Establish ambient environmental conditions (e.g. temperature, sunlight, humidity and precipitation) and the associated impacts on pests.
 4. Identify the growth stage of the pest and its susceptibility to treatment.
 5. Identify the current life or growth stage of the pest's host (if applicable) and its conditions.
 6. Identify the presence, identity and population levels of beneficial insects, wildlife and birds.

Specific monitoring techniques are dependent on the type of pest, and the budget and resources available to the superintendent. The most common technique is frequent visual inspections and the monitoring of environmental conditions by the superintendent. Other techniques include setting traps for insects and retaining biologists to carry out independent reviews and inspections.

Maintenance of good records is an important component of a monitoring program. Specific information to be recorded will include:



1. The name of the pest.
 2. Where it was encountered.
 3. The amount of damage.
 4. Date of occurrence.
 5. Weather conditions present.
 6. Control measures used.
5. Developing and implementing pest control strategies can involve either cultural or non-cultural methods. Cultural methods are essentially preventative measures which block or reduce the extent of pest problems and focus on turf health. Examples of cultural methods are as follows:
- Select turfgrass cultivars adapted to local climatic conditions;
 - Conserve native grass species or establish diverse grass species where possible;
 - Incorporate organic amendments (such as peat moss, compost or straw) in areas where organic content of the soil is low to improve water and nutrient-holding capacity, enhance drainage and promote aeration;
 - Aerate compacted soil;
 - Provide good drainage;
 - Use fencing to prevent injury over the winter;
 - Place protective covers on greens and tees over the winter, if deemed necessary;
 - Raise mowing height and reduce mowing frequency;
 - Mow with sharp blades;
 - Return grass clippings to grass areas, wherever possible;
 - Use high quality seed stock / varieties that are disease-free and disease-resistant;
 - Manage soil fertility, weed control and irrigation to help maintain a strong, healthy grass stand and increase disease resistance;
 - Schedule early-morning irrigation in areas that are susceptible to disease;
 - Thin tree stands on the windward sides of greens and tee boxes to promote adequate air circulation;
 - Minimize shade in areas susceptible to disease;
 - Avoid putting green slopes with a northern aspect, if possible;
 - Spread dark organic material on greens and tees to accelerate snow melt, but avoid substances that could generate toxic runoff or sedimentation;
 - Use snow blowing equipment and snow fencing to distribute snow evenly;
 - Till exposed soil at new courses or new areas within existing courses to kill growing weeds;
 - Prevent the spread of disease and weeds by equipment;
 - Hand-pull or spot treat weeds growing in small patches;
 - Select native or pest-resistant trees, shrubs, and ornamentals;



- Use traps or repeated flooding of burrows to control gophers and ground squirrels;
- Use tree guards to control damage by rabbits and porcupines;
- Use traps to control beavers, or remove their dams and lodges;
- Focus on the early recovery of turfgrass areas affected by mice;
- Aerate ponds;
- Use mechanical methods for removing vegetation, taking care to remove roots and plant debris, and;
- Control aquatic vegetation.

Non-cultural methods utilize either biological controls or pesticides for pest control. Biological controls involve the use of specific organisms (e.g., weed-eating fish, snails, etc.) to control the pests. Other control organisms include bacteria, predatory insects, bats and birds. Given that the use of biological controls is relatively new, combined with the potential adverse consequences of introducing new species into the local environment, you should consult with a biologist prior to implementing any of these control options.

In addition to the above steps in the implementation of a golf course IPM program, the CGSA supports the use of federally registered pest control products identified for use on golf courses, if and when they are to be used as part of an IPM program.

These protocols, implementation steps, and pesticide use guidelines are all integral parts of a successful IPM initiative at any golf property.