

## IPM Resources Available Through GCSAA

### Introduction

Integrated Pest Management (IPM) is a system that enables a golf course superintendent to identify what areas of the golf course are under the most stress and determine whether that stress will result in an increase in pest activity or damage. IPM could also be described as Intelligent Plant Management.

GCSAA is committed to helping every superintendent develop a site-specific IPM plan for his or her facility. This document briefly lists some of the key points of IPM and catalogs some of the resources GCSAA has compiled to help familiarize a superintendent with IPM and help him or her put together an IPM plan.

### Best Management Practices (state-specific)

GCSAA lead an initiative that created “Best Management Practices” (or BMPs) for each of the 50 states. These comprehensive documents discuss many aspects of golf course design and maintenance (including water quality management and monitoring, cultural practices, nutrient management, pesticide management, and protecting pollinators). They also include a separate chapter on Integrated Pest Management that focuses on regionally-specific issues. Visit [gcsaa.org/bmp](http://gcsaa.org/bmp) for more information.

### Golf Course IPM Resources

There are several “fact sheets” at [gcsaa.org/ipm](http://gcsaa.org/ipm) that describe different aspects of IPM in some detail. Review those documents to get a better understanding of the kinds of things that are involved in creating an IPM plan. See:

- *What is IPM?*
- *The importance of site assessment in developing an IPM plan*
- *Establishing tolerance levels (“action thresholds”)*

### Stress management

IPM involves identifying what the primary stressors are on your golf course and working to minimize those stresses. Some stresses may be related to agronomic conditions, while others may be caused by various living organism (e.g., insect pests, pathogens, or weeds). Turf usually can handle one or two stresses, but begins to suffer when several stresses are present at the same time. So if you are dealing with drought and high temperatures, a relatively low population of insects may cause more damage than you would observe if you had adequate soil moisture and more seasonable temperatures. In essence, IPM comes down to stress management. *Golf Course Management* and the *USGA Green Section Record* have provided many articles over the years discussing various aspects of agronomic stress e.g., (soil moisture extremes, effect of soil type on turf vigor, selecting the “best” turf species or cultivar for your conditions, and much more).

### Scouting for pests

If the turf is already under agronomic stress (e.g., air or soil temperature, soil moisture, low mowing heights, low fertility, compaction, or shade), it is less able to tolerate activity from pests such as insects, pathogens, or weeds. It is important to know what pests are most likely to be present in your region, and know how to look for them. *Golf Course Management* and the *USGA*

*Green Section Record* have provided many articles over the years discussing many of the more common pests and offering insights on ways to manage them.

### **Optimize management options**

An IPM plan considers the full gamut of management options when pest control is needed. The goal is to maintain turf so that pest populations remain below the tolerance level. Options include adjusting cultural strategies using biological control agents, or using pesticides if needed. Ordinarily pesticides are used as a “last resort” in an IPM plan, but because tolerance levels (especially on putting greens) are often very low, the margin for “error” is very small in many golf course settings. Therefore, pesticides often are used to manage pest populations on golf courses.

**Cultural strategies** may be available to put the turf at an advantage or put the pest at a disadvantage. An example would be withholding irrigation during the time when invasive crane flies are laying eggs, because wet soils increase the survival of the eggs and the larvae. Several articles have been written in *Golf Course Management* and the *USGA Green Section Record* in recent years discussing various aspects of agronomic stress.

Some insect populations can be reduced by applying **biological control** agents. These agents often are more specific and/or less toxic than synthetic pesticides, and so are less detrimental to the environment. For that reason, they are often considered as a key part of an IPM plan. However, there are some drawbacks to using biological control agents, and there are many pests for which there are no biological control options available. More detailed information is available for those who are interested in using beneficial nematodes or bacteria to control insect pests.

**Pesticides** are part of an IPM plan, but it generally is understood that the superintendent will try to use a pesticide that minimizes disruption to the environment whenever possible. This means you may select a pesticide that is not as persistent, is less soluble, or is less toxic to vertebrates than another pesticide (assuming the two pesticides are equally effective against the pest). Several fact sheets have been created on [gcsaa.org/ipm](http://gcsaa.org/ipm) to provide information on selecting pesticides.

### **Evaluation/record keeping**

Another important aspect of IPM is evaluating the steps you took. Did your effort to reduce a pest population work? If so, what went well and what would to change next time? If it didn't work very well, what do you think went wrong? Keeping these records can help you learn from your mistakes and make better decisions the next year.

### **Communication**

It is very important to communicate with your golfers / members, greens committee, owner, or club president when you begin to develop an IPM plan. Let them know what you are trying to do, and try to explain some of the key concepts of IPM. Assure them that IPM is essentially a decision-making process that will help you to make informed decisions about many aspects of course maintenance.

