# **Academic Campus Integrated Pest Management Program**

Integrated Pest Management (IPM) is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices. Our Academic Campus IPM program uses current, comprehensive information on the life cycles of pests and their interaction with the environment. This information, in combination with available pest control methods, will be used to manage pest damage by the most economical means, and with the least possible hazard to people, property, and the environment.

# How does our IPM program work?

IPM is not a single pest control method but, rather, a series of pest management evaluations, decisions and controls. In practicing IPM, we will follow a four-tiered approach. The four steps include:

# Set Action Thresholds

Before taking any pest control action, our IPM program first sets an action threshold, a point at which pest populations or environmental conditions indicate that pest control action must be taken. These thresholds could differ by location, Arboretum and outlying areas compared to main campus. Some threshold examples below:

* + Grubs in turfgrass 5-10 per square feet before treatment
  + Disease: Campus- no chemical treatment but change cultural practices
  + Weeds: Campus Turf area no more than 5% turf area

# Monitor and Identify Pests

Not all insects, weeds, and other living organisms require control. Our IPM program will work to monitor for pests and identify them accurately, so that appropriate control decisions can be made in conjunction with action thresholds. This monitoring and identification removes the possibility that pesticides will be used when they are not really needed or that the wrong kind of pesticide will be used.

Objectives of a monitoring program are as follows:

* Determine the extent and nature of any turf or plant damage.
* Determine the presence and population of pests.
* Establish ambient environmental conditions (e.g. temperature, sunlight, humidity and precipitation) and the associated impacts on pests.
* Identify the growth stage of the pest and its susceptibility to treatment.
* Identify the current life or growth stage of the pest's host (if applicable) and its conditions.
* Identify the presence, identity and population levels of beneficial insects, wildlife and birds.
* Maintenance of good records is an important component of a monitoring program. Specific information to be recorded will include:
* The name of the pest.
* Where it was encountered.
* The amount of damage.
* Date of occurrence.
* Weather conditions present.
* Control measures used.

# **Prevention**

As a first line of pest control, the IPM program will work to prevent pests from becoming a threat.

Cultural methods

Cultural methods, are essentially preventative measures which block or reduce the extent of pest problems and focus on turf health. These control methods can be very effective and cost-efficient and present little to no risk to people or the environment.

Examples of cultural methods are as follows:

* Aeration, topdressing, topdressing, thatch removal, and overseeding to promote a healthy turfgrass environment.
* Hand-pull or spot treat weeds growing in small patches
* Select native or pest-resistant trees, shrubs, and ornamentals in landscape beds. 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 and provide good drainage;
* 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;
* Minimize shade in areas susceptible to disease;
* Till exposed soil to kill growing weeds;
* Prevent the spread of disease and weeds by equipment;
* Use traps or repeated flooding of burrows to control gophers and ground squirrels;
* Use tree guards to control damage by rabbits and porcupines;
* Use mechanical methods for removing vegetation, taking care to remove roots and plant debris,

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.

# Control

Once monitoring, identification, and action thresholds indicate that pest control is required, and preventive methods are no longer effective or available, the IPM program then evaluates the proper control method both for effectiveness and risk.

Effective, less risky pest controls will be chosen first, including highly targeted chemicals, such as pheromones to disrupt pest mating, or mechanical control, such as trapping or weeding. If further monitoring, identifications and action thresholds indicate that less risky controls are not working, then additional pest control methods would be employed, such as targeted spraying of pesticides. Broadcast spreading of non-specific or non-selective pesticides is a last resort.

## Physical Controls

* If preventative measures fail to prevent pest problems, a second strategy is to use mechanical trapping devices, natural predators including various insects and birds, insect growth regulators, pheromones or other mating disruption substances. Some pests can often be removed by hand, or by using a strong jet of water, other physical practices, including pruning, raking, and regular mulching also help. Using physical controls will mean taking a more active role in pest management, without spending time and money on pesticide treatments that may harm the environment.

## Horticultural Controls

* Horticultural practices such as pruning, mulching, planting pest-resistant trees and shrubs, composting decayed plant material and using it to improve soil quality also help control pest populations safely and effectively while protecting the environment from chemical overuse.

## Biological Controls

* Biological controls is another safe way to manage pests without the use of chemicals. The most common natural enemies include predators, parasites, and pathogens. Predators, including various insects, birds, bats and moles help consume and eliminate large numbers of pests. Ladybugs, for example, help control aphids.

## Chemical Controls

* Chemical pesticides are the last resort, used only when alternative controls have been exhausted. With IPM, we will use the least toxic pesticides only when a pest is actively causing serious damage. We will not spray on a calendar basis.

# Pest prevention

Pest prevention is a fundamental IPM concept. Prevention involves removing the conditions that might attract a pest or disease or provide it with the food and environment it needs to thrive. Some plants need full sun, some do better in shade. Some grow best in sandy soils, others in clay or wetlands. Some need a lot of fertilizer, others very little. Nothing does well surrounded by weeds that compete for light, fertility and water and often harbor insects and diseases.

When selecting annuals, perennials, shrubs or trees we will make sure the soil and light conditions support the particular plant's needs. Strong healthy vegetation is much less susceptible to attacks by insects or disease. Monitoring flowers, vegetables and landscape plantings for damage every week during the growing season will help reduce pesticide use.

With frequent monitoring, we are more likely to spot the problem before it has a chance to get too far. If we do identify a particular insect or disease, we will first consider the level of damage, and then determine the best approach.