EMORY UNIVERSITY

Exterior Services,
Facilities Management,Campus Services

Emory University's Integrated Pest Management Principles

The foundation of any IPM strategy is prevention. Whenever possible, landscapes including turf and ornamental plantings can be planned by selecting plant species or varieties that are least likely to serve as a pest host or harbor site. Once established, plants should be cared for to reduce or eliminate any stress, to allow for vigorous and healthy plant growth.

IPM practices -cultural, mechanical, biological and chemical - are the methods used to execute an IPM Strategy. The practices are based on a series of concepts, one of which is pest identification. A "pest" is an insect, plant disease, weed or other organism that hinders or constrains plant health or becomes an annoyance to people.

Cultural Practices

At Emory, plant selections are made primarily from an established plant palette that consists of species and cultivars chosen for their resistance to disease and lack of insect problems. Once a given species or cultivar is selected for a particular planting site, the conditions of the site are observed and evaluated to verify the plant will thrive in the chosen location. Planting a native plant in a microclimate different than its native habitat can create disease and insect problems not commonly found on that particular plant. Choosing an optimum planting site that replicates a plants natural habitat is crucial in preventing insect or disease problems.

Healthy thriving plants are best able to resist disease and are better suited to survive moderate insect populations; stressed and declining plants and trees are often the target of damaging insects and diseases. Initial planting of landscape material puts a certain amount of stress on a plant. Newly planted landscapes are monitored closely for any insect or disease activity as often insects or disease could have been transported with the plant from the nursery prior to planting. Care is taken to insure that the newly planted landscapes have sufficient soil moisture, light, air circulation, and nutrition for the plants to thrive. Wood boring insects typically attack declining trees and often, death of the tree can occur within weeks of an infestation. Trees on campus are routinely inspected. Any trees showing a decline in health are prescribed root therapy involving aeration, fertilization, and inoculation of the root zone with beneficial mycorrhizae. If a tree is infested with boring insects it may be necessary to spray trunks of nearby susceptible trees with an insecticide targeted for that specific boring insect.

Mechanical Practices

There are certain mechanical practices that are incorporated in Emory landscape maintenance to help minimize insect and disease occurrence.

Mower blades are kept sharp to help turf grass resist disease. Turf grass that is mowed with dull blades will have frayed leaf tip edges that create an entry way for turf disease organisms.

Certain annual and perennial species are regularly 'deadheaded"(removal of spent flowers) to reduce the incidence of disease occurring on the decaying spent flower.

Woody ornamentals such as Azaleas are pruned to allow adequate air circulation. Soil borne diseases can develop within the roots of plants without adequate air circulation.

Trees are inspected frequently to detect dead or decaying limbs or wounds on the limbs and trunks. Any wound on the cambium layer and outer bark of a tree can be an entry point for insects and disease organisms.

Biological Practices

Most all pests have natural enemies. It is beneficial to know and be able to recognize pest natural enemies for biological control. Insects are important food for many amphibians, birds, mammals, and reptiles. Many beetles, true bugs, flies, and lacewings are predators of various pest mites and insects. Most spiders feed entirely on insects. Lady bugs control aphids and mites and many bird species feed on grubs living in the soil supporting many turf grasses.

Pathogens are microorganisms including certain bacteria, fungi, nematodes, protozoa, and viruses that can infect and kill the host. Populations of some aphids, caterpillars, mites, and other invertebrates are sometimes drastically reduced by naturally occurring pathogens, usually under conditions such as prolonged high humidity or dense pest populations. In addition to naturally occurring disease outbreaks, some beneficial pathogens are commercially available as biological or microbial pesticides. One such pathogen is Bacillus thuringiensis or Bt. Bacillus thuringiensis spores are non-toxic to fish and mammals but kill many types of damaging insect larvae such as the cabbage lopper.

Chemical Practices

Before any decision is made to use a pesticide to control an insect or disease problem several factors need to be considered.

First and foremost, will the insect population or disease kill the plant or severely damage the plant?

Is this the right plant for this particular site? Can the plant be removed and replaced with a species that will be more resistant to insects or diseases in this particular location.

If determined that the plant is one that will continue to grow on this particular site then make a positive identification of the insect or the plant disease. Once the insect or causal organism is identified then determine what measures will be used to eliminate or control the insect population or incidence of disease to a tolerable level. Alternatives to chemical insecticides or fungicides are used when available. For example, horticultural oils that are non-toxic can be an effective control measure for scale insect populations.

If it is determined to be absolutely necessary to apply an insecticide or fungicide then identify the insecticide or fungicide that has the least harmful effects on other insects, plants, and animals but yet will provide an acceptable level of control of the target pest. Careful consideration is given to how the active ingredient is degraded in the environment. We want to choose pesticides that do not readily become water soluble and we choose pesticides that break down rapidly in the environment. Many pesticides breakdown rapidly when exposed to sunlight and warm temperatures.

Once a product is chosen for a given application, care is taken by the certified applicator to apply the product according to the product label. Additional consideration is given to determine the best time to apply the product to limit the chance of contact with people or animals. The air temperature must be within an acceptable range as some active ingredients could volatize under high temperatures causing damage to nearby healthy plant materials. Wind direction and speed must be considered before any liquid spraying can be conducted as the spray may drift onto healthy plants or even drift to an area where animals and people may be present.

In general, the best time to apply liquid products is early mornings on cool days with little or no wind.

A complete list of the products Emory may use on campus is kept in the Grounds Department and meticulous records are kept of all applications made on campus. All areas where an application has been made must be “posted” to inform people of the application that has occurred in the previous 24 hours.