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FURMAN UNIVERSITY

IPM Plan for Campus Landscape

Statement of Purpose

The purpose of this integrated pest management (IPM) plan is to guide the use of environmentally sensitive pest management strategies and least-toxic control methods at Furman University to enhance the health and safety of campus landscape users, and protect the environment including water, soil, and biodiversity.

Applicability

This IPM applies to the entire campus landscape (managed and unmanaged) and Swan Lake, with the exception of the golf course.

Goals

The goals of the IPM program at Furman are:

1. Protect human health and environmental health by employing a range of preventative strategies and using least-toxic products for pest control and eradication.
2. Inspect and monitor pest populations to enhance control strategies.
3. Minimize the quantity and toxicity of chemicals used for pest management.
4. Minimize environmental impacts by using species-specific pesticides and targeting application areas carefully.
5. Establish clear criteria for acceptable circumstances in which using a pesticide other than a least-toxic pesticide is necessary; toxic pesticides shall only be used when there is a threat to public health and safety, or to prevent economic or environmental damage, and only after other alternatives have been implemented and are shown to be ineffective.

IPM Response Plan

One of the characteristics of the IPM approach that makes it so effective is that the basic decision-making process is the same for any pest problem in any location. While strategies and specific tactics may change, the steps taken to decide if and when treatment is needed and which methods to use are consistent components of the IPM. The Furman IPM program is built around the following components:

- Monitoring the pest populations and other relevant factors
- Accurate identification of the pest
- Determining injury and action levels that trigger treatments
- Timing treatments to the best advantage
- Spot treating the pest (to minimize human and other non-target organism exposure to pesticides)
- Selecting least disruptive tactics
- Evaluating the effectiveness of treatments to fine tune future actions

Setting Injury and Action Levels

Before any course of action can be determined, it is first important to determine the damage or injury level tolerated before a pest management action is taken. The injury level is the level of damage or the level of pest population that causes unacceptable injury. Once the injury level is determined, an action level is set. In most cases, the injury level will be higher than the action level, meaning that action should occur before the situation progresses the point of unacceptable injury (see Fig. 1). The action level is the level of pest damage or number of pests that triggers treatment to prevent pest numbers from reaching the injury level. However, in certain, well-known and specific circumstances, pre-treatment is necessary to prevent the outbreak of certain pests that would cause a high level of injury and subsequent use of higher quantities and/or increasingly toxic pesticides to control them.

Aesthetic injury applies mainly to the damage of plants. This is injury that affects the appearance without affecting the health of the plant.

Economic injury refers to pest damage that causes monetary loss.

Medical injury relates to human health problems caused by pests.

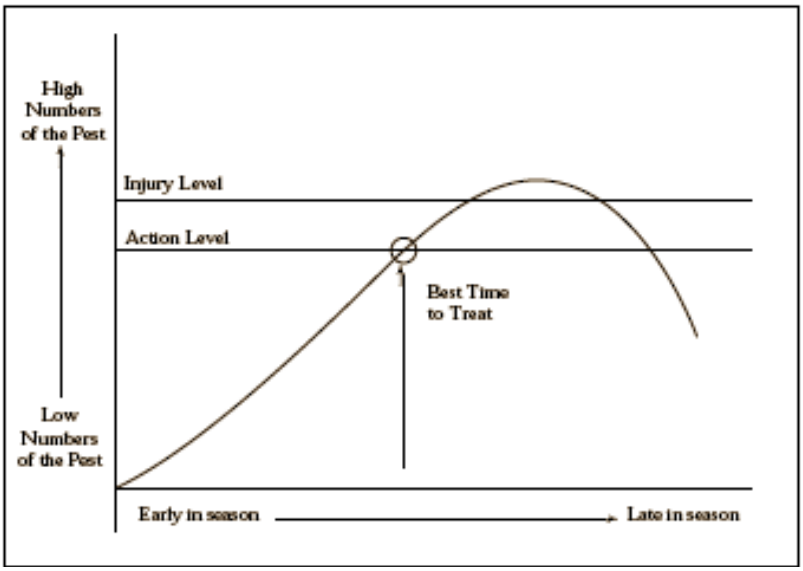

Figure 1. Injury & Action Level

Criteria for Selecting Treatment Strategies

Once the IPM decision making process is in place and monitoring indicates that pest treatment is needed, the choice of specific strategies can be made. Choose strategies that are:

1. Least hazardous to human health
2. Least toxic to non-target organisms other than natural controls
3. Least disruptive of natural controls in landscape situations
4. Most likely to be permanent and prevent recurrence of the pest problem
5. Easiest to carry out safely and effectively
6. Most cost effective in the short and long term
7. Appropriate to the site and maintenance system

Treatment Options

Education. Education is a cost-effective pest management strategy. Information that will help change people's behaviors, including planting pest-resistant landscape plants, will play a part in managing certain pests.

Habitat modification. Pests need food, water and shelter to survive. If the pest manager can eliminate or reduce the resources pests need to flourish, the environment will support fewer pests. Examples of habitat modification include: design or redesign of structures and landscape plantings; improved sanitation; eliminating water sources for pests; and eliminating the pest habitat.

Physical controls. Methods of physical control (or direct removal of pests from an environment) include trapping and removing pests by hand.

Biological controls. A biological control uses a pest's natural enemies to attack and control the pest. Biological control strategies include conservation (conserving the biological control application), augmentation (artificially increasing the number of biological controls in a given area) and importation (importing foreign controls).

Least toxic chemical controls. Least toxic pesticides are those with all or most of the following characteristics: they are effective against the target pest, have a low acute and chronic toxicity to mammals, biodegrade rapidly, kill a narrow range of target pests and have little or no impact on non-target organisms. These include materials such as the following:

- Pheromones and other attractants
- Insect growth regulators
- Repellents
- Desiccating dusts
- Pesticidal soaps and oils
- Some botanical pesticides

The following criteria should be used when selecting a pesticide:

- Safety
- Species specificity
- Effectiveness
- Endurance
- Speed
- Repellency
- Cost

Pesticide Label and Categories

Furman's pesticide classification system is based on the Environmental Protection Agency (EPA) Pesticide Label and Toxicity Categories. A key function of the pesticide product label is to manage the potential risks from pesticides. EPA requires extensive scientific data on the potential health and environmental effects of a pesticide before granting a registration, which is a license to market that product in the United States. EPA evaluates the data and ensures that the label translates the results of those evaluations into a set of conditions, directions, and precautions that define who may use a pesticide, as well as where, how, how much, and how often it may be used. Toxicity Categories are based on five types of acute exposure as specified in Figure 2, below.

Hazard Indicators	I	II	III	IV
Oral LD_{50}	Up to and including 50 mg/kg	>50 thru 500 mg/kg	>500 thru 5,000 mg/kg	>5,000 mg/kg
Dermal LD_{50}	Up to and including 200 mg/kg	>200 thru 2000 mg/kg	>2000 thru 20,000 mg/kg	>20,000 mg/kg
Inhalation LC_{50}	Up to and including 0.2 mg/liter	>0.2 thru 2 mg/liter	>2 thru 20 mg/liter	>20 mg/liter
Eye irritation	Corrosive; corneal opacity not reversible within 7 days	Corneal opacity reversible within 7 days; irritation persisting for 7 days	No corneal opacity; irritation reversible within 7 days	No irritation
Skin irritation	Corrosive	Severe irritation at 72 hours	Moderate irritation at 72 hours	Mild or slight irritation at 72 hours

Figure 2. Acute Toxicity Categories. US EPA Label Review Manual Chapter 7: Precautionary Statements

The following signal words are used to indicate the Toxicity Category:

Toxicity Category I: "Danger"
Toxicity Category II: "Warning"
Toxicity Category III: "Caution"
Toxicity Category IV: No signal word required.

Record Keeping

Monitoring the effectiveness of the IPM plan over time requires diligent tracking of several items: pest populations and locations; management strategies employed; quantities and types of chemicals and products used; and the outcome of pest management activities. The pest control applicator, with support from the Superintendent of Grounds and the University, is responsible for maintaining records that include the information below. See the appendix for the Pesticide Application Record form that shall be used at Furman to standardize all record keeping activities.

1. Target pest
2. Prevention and other non-chemical methods of control used
3. Type and quantity of pesticide used
4. Location of the pesticide application
5. Date of pesticide application
6. Name of the pesticide applicator
7. Application equipment used
8. Summary of results

General Preventative Practices

General preventative practices are simple landscaping procedures that eliminate sources of food, water and shelter that attract pests to the building grounds. Furman shall use the following methods as the first and primary means for controlling pests and preventing outbreaks:

1. Use mulch and other landscaping best practices to promote soil and plant health.
2. Use weed-free soil amendments.
3. Maintain and plan landscape features to eliminate safe havens for pests and rodents.
4. Clean up plant debris, especially from fruit-bearing trees.
5. Remove invasive plants that are known to harbor or provide food for pests.
6. Habitat modification including design or redesign of structures and landscape plantings; improved sanitation; eliminating water sources for pests; and eliminating the pest habitat.

Responsible Parties

Superintendent of Grounds and Sports Turf is responsible for overseeing the implementation of the IPM plan and ensuring compliance.

All pest control vendors contracted to work at Furman are responsible for adhering to this policy.

All pesticide storage, transportation, and application will be conducted in accordance with the requirement of the Federal Insecticide, Fungicide, and Rodenticide Act (7 United States Code136 et seq.), Environmental Protection Agency regulations in 40 CFR, Occupational Safety and Health Administration regulations, Furman policies and procedures, and local ordinances.

APPENDIX: Pesticide Application Record

Pesticide Application Record for ____
(farm unit, business name, etc.)

Year:______ Date: Mo/Da Time:*	Crop and Target Pest	Location*	Pre-application action(s)	Wind Speed/ Direction / Temp.	Active Ingredient* ___________ Brand or Product Name	EPA Registration Number*	# of Units or Acres	Total Amount of Product (oz., lb., pt., qt., gal indicator)	Applicator Information	Restricted Re-entry Interval* Duration (HOURS)	Expiration (Mo/Da/Time)	Summary of Results