

## Ornamental & Turf Pest Control 3A Study Guide

This study guide is intended to serve as an outline of the knowledge base covered by the Ornamental & Turf Pest Control 3A Exam. If you don't understand a statement, refer to the New Mexico Ornamental & Turf Pesticide Applicator Training Manual and the National Pesticide Applicator Certification Core Manual for more information. This exam consists of 50 multiple choice questions taken from the manual. Topics include:

1. General Ornamental & Turf Knowledge
2. Pest Management
3. Pest Characteristics
4. Pesticide Application
5. Formulas/Equations

### 1. General Ornamental & Turf Knowledge

- a. Integrated Pest Management (IPM) combines appropriate pest control tactics into a single plan to reduce pests and their damage to an appropriate level. Producing healthy plants that resist pests would be part of an IPM program.
- b. To reduce the development of pesticide resistance you should use pesticides less often.
- c. Indicator plants are typically the first plants to be affected by a pesticide.
- d. Drift from an application of pesticides may contaminate nearby plants, streams or turf.
- e. Pesticides in the soil are eventually broken down by bacteria and fungi.
- f. An emulsifiable concentrate (EC) is the formulation most likely to burn plants.
- g. Complete metamorphosis is the most common type of development among turf grass pests.
- h. Complete metamorphosis of an insect is characterized by four distinct stages of development.
- i. Most turf diseases are caused by fungi and bacteria.
- j. Soil moisture, sunlight and soil fertility are all components of the disease pyramid.
- k. Environmental factors that may affect turf grass health include air flow and temperature, soil drainage and soil compaction.
- l. A hand lens is useful for identifying insects. A 5-10 power magnification level is recommended when choosing and using a hand lens.
- m. Thatch is the layer of living and dead plant stems, leaves and roots that develops between the soil surface and the green vegetation.
- n. Low pH and poorly drained soils contribute to excessive thatch.
- o. Use less fertilizer and aerate soil to prevent excessive thatch.
- p. Most turf areas need about 1 inch of water per week.
- q. To reduce disease and promote healthy turf, you should water thoroughly when you first see signs of wilt.
- r. The microorganisms that cause disease are called pathogens.
- s. Bacteria are one-celled, microscopic organisms that cause shoot blights and galls.
- t. Fungi are responsible for most plant disease in landscapes.

- u. Viruses are pathogens that are too small to see even with a microscope.

## 2. Pest Management

- a. The goal of pest management is not to eliminate every pest, but to keep damage at an acceptable level.
- b. Bait traps, light traps and pheromone traps all help in monitoring sod webworm populations.
- c. Keeping thatch below ½ inch thick reduces winter shelter for many pests, allows the soil surface to dry out and allows the movement of pesticides through the soil to come into contact with the target pest.
- d. Milky spore disease (*Bacillus popilliae*) is only effective against Japanese beetle grubs.
- e. A non-chemical control for fire ants is frequent mowing.
- f. Insecticidal soaps are effective for control of aphids, mites and white flies.
- g. Insect growth regulators prevent pests from hatching or molting properly.
- h. An advantage of using a systemic fungicide for turf disease management is that it translocates to protect newly formed tissue.
- i. To reduce Pythium blight, provide good surface and subsurface drainage.
- j. Good turf management includes correct water and fertilizing, proper mowing and thatch removal, and proper site preparation.
- k. You should aerate the soil if compact soil is a problem.
- l. Prevention is the most important and often the only effective method of disease control.
- m. Broad spectrum fungicides work against a wide variety of fungal pathogens.
- n. Protectant fungicides are also called contact fungicides.
- o. Systemic fungicides can prevent development of the disease at the site of uptake and in other regions of the plant.
- p. Most systemic fungicides are only moved upward in the xylem.
- q. Systemic fungicides may control fungi that have already entered the plant.
- r. Protectant fungicides tend to make it more difficult for the fungi to develop resistance.
- s. Systemic insecticides are most effective on insects which have piecing-sucking mouth parts.
- t. Pheromones, miticides, pyrethroids, herbicides, rodenticides, avicides, and ovicides are all pesticides.
- u. Biological agents for controlling pests include predaceous insects, parasitic insects and microorganisms.
- v. Phytotoxicity is an undesirable plant injury and may be caused by insecticides, fungicides or improper fertilization.
- w. The excessive use of nitrogen often leads to lush plants that are susceptible to disease.
- x. The most important factor in preventing lawn disease is proper management of fertilizer and water.

## 3. Pest Characteristics

- a. A mature fire ant queen can lay up to 800 eggs per day.

- b. Red fire ant mating flights are most common in spring and fall in the afternoon after a rainy period.
- c. Spider mites have piercing mouthparts.
- d. Fall webworms have chewing mouthparts.
- e. Japanese beetles have one generation each year.
- f. Foliar parasitic nematodes cause leaf discoloration and infested leaves to drop off.
- g. Insects have three pairs of legs.
- h. Insects have three body segments.
- i. Insects are most vulnerable and easiest to control in the larval or nymphal stages.

#### **4. Pesticide Application**

- a. If the re-entry period is not listed on the label you should make sure the treated area is dry before allowing re-entry.
- b. Tank mixing is combining two or more pesticides or a pesticide and a fertilizer together in a spray tank. Tank mixing is legal unless prohibited by the Directions for Use section of the labels.
- c. For your application records, keeping a map of the spray site is often helpful.
- d. Keeping records helps you comply with pesticide regulations and helps you to know whether or not a treatment was effective.
- e. When you decrease the speed of your application equipment by half, the application rate of your boom sprayer will double.
- f. When calibrating your spray equipment you should only have water in the tank.
- g. You should check the calibration of your sprayer whenever changing pesticides.
- h. When treating small trees, shrubs or ornamentals, you generally calibrate your equipment by volume.
- i. When using a boom sprayer, the height of the nozzle above the ground determines the swath width or the effective spray area per nozzle.
- j. A spreader sticker/wetting agent may need to be added to a tank mix when making a pesticide application to waxy or hairy leaves.
- k. One of the principal differences between an emulsifiable concentrate (EC) and a wettable powder (WP) is that constant agitation is necessary to keep WPs suspended.

#### **5. Formulas/Equations**

- a. Be able to determine the amount of granular insecticide needed to treat a given acreage assuming a given label rate in pounds per square foot.
- b. Be able to determine the amount of fungicide in ounces needed to treat a given area when given a label rate in ounces per square foot.
- c. Be able to determine the total spray solution needed to treat a given area when your sprayer is calibrated to deliver a given amount of gallons per square foot.