Ornamental & Turf Certified Operator Exam Study Guide

Pest Prevention

- Sanitation can prevent pest establishment.
- Roughing (removal of infested/infested) reduces the potential for widespread insect identification or disease infestations.

Early Pest Detection

- During spring and summer, some pest insects reproduce so rapidly that close inspection of plants should be made every other day.
- This may involve only a general inspection of the plants for loss of color, stunting or holes in the leaves.

Insects of Ornamentals

Scales

- Most soft scales attach themselves to the host plant soon after hatching.
- Scales occur on the underside of leaves and can remain undetected until populations become so large that the plant is stunted and weakened.
- Prevention: make frequent inspections.
- Newly hatched scales are easier to control that mature ones

Mealybugs

- Small sucking insects that are pests of annuals and perennials

Aphids

- Soft bodied insects that are pests of annuals and perennials
- Usually attack young tender growth of plant

Whiteflies

- In LA, there are 3 generations of this insect.
- Serious pest of greenhouse and outdoor plantings.

Thrips

- Can be either a flower or foliage feeder depending on the species.
- Heaviest during the spring and summer

Caterpillars

- Can attack trees or flowering plants depending on species.
- Larval stage of moths

Slugs and Snails

- Primarily night feeders
- Occurrence is usually heaviest in dark, damp areas.

Leafminers

- Larvae are tiny yellow maggot
- Adults are small and black and yellow flies
- Larvae /maggot stage feedds creating long, slender winding white mines under the epidermis of leaves.
- There can be several generations in one season.

Spider Mites

- Mites are NOT insects
- Most species have several generations during the year
- Highest populations in the fall and spring.
- Lowest populations are midsummer.

Weeds of Ornamentals

Annuals

Common Purslane (summer)
Redroot pigweed (summer)
Smooth pigweed (summer)
Common lamb's quarters (summer)
Sow thistle (winter)
Crab grass (summer)
Common yellow wood sorrel (summer)**
Black nightshade (summer)
Carpetweed (summer)
Spiny amaranth (summer)

Perennials

Poison ivy
Japanese honeysuckle
Mouse-eared chickweed
Dandelion
Bermuda grass
Johnson grass
Common greenbrier
Blackberry, dewberry bramble
Curly dock
Smooth ground cherry
Broadleaf plantain
Florida betony
Dollarweed
Purslane speedwell
Bittercress

**Common yellow wood sorrel can be a perennial

Spiny amaranth is found in nurseries and holding areas and cultivated fields

General Ornamental Diseases

General Decline

- Used to describe
    - Growth gradually become sparse weak and spindly throughout the plant
    - The older leaves drop prematurely
    - Foliage develops a yellow cast or color

Crown Gall

- Destructive disease of certain shrubs and trees.
- Roses , euonymous and willow are particularly susceptible

Fire Blight

- Most serious on pears, applies, crab apples and hawthorns
- To control, prune all blight twigs and limbs from the affected plant during the winter
- Caused by bacteria that overwinters in cankers on severely blighted trees.
- Bacteria is spread by bees and other polinators

Nematodes: Usually most abundant in coarse-textured (sandy) soil.

Powdery Mildew:

- Most common problem in crape myrtles
- Most abundant in late summer and fall

Rusts

- Rust fungi are obligate parasites, they require a living host (plant) on which to grow to complete their life cycle

Sooty Mold

- Is a fungus that occurs as a dark, sooty coating on the upper surfaces of leaves and stems of plants
- Commonly found on willow, tulip poplar, crape myrtle, gardenia, Ligustrum, holly
- Doesn't not attack the plant, it grows superficially on honeydew
- Interferes with light absorption and air exchange that occurs in leaves
- Cool, humid weather in early spring favors development
- Control is achieved by controlling the infesting insects that are depositing the honeydew

Leaf Spots

- Generally, not fatal to trees and shrubs
- Can cause sever defoliation when weather conditions favor their development
- Use of fungicides is not practical

Specific Ornamental Diseases

Arborvitae: Foliage blight caused by the fungus *Cerospora thijina* is very destructive to arbovitae

Aucuba:

- Anthracnose: dark spots may occur on the leaves or stems
- Azalea leaf galls:
    - causes disfigurement and unsightly appearance, but generally not much damage.
    - But, under humid conditions and without any control measures, infections may become so numerous that the plant is harmed.
- Azalea Petal Blight:
    - Also known as flower blight.
    - Caused by the fungus, *Ovulina azalea*
    - Affects only the floral/blossoms parts of the plant
    - Shortens the life of the flowers by breaking down tissue in the petals.
- Azalea Decline:
    - Azaleas are susceptible to several root rots and soil problems
    - Azaleas are not tolerant in soils with high pH. They prefer acid soils (5.5)

Boxwood

- Boxwood Decline
    - Due to a variety of factors that reduce the vigor of the plant
    - Not well adapted to soils with heavy organic matter
    - *Phytophthora* root rot is characterized by a loss of lusted and color change in foliage from dark to light

Camellia

- Camellia Canker or Dieback
    - Most serious of pests for *C. japonica* and *C. sasanqua*
    - Caused by the fungus, *Glomerella igulata*
    - Can cause losses in grafted plants as well as established plantings
    - High humidity and high nitrogen favor development
    - Fungus must have wound of some type to enter the plant
    - Leaf scars are most important infection point
    - Injury can be caused by mowers, rodents, yard tools, grafting
    - High humidity and high nitrogen favor disease development
    - Disease can occur at any age
    - First symptom noticed is wilting of leaves on young twigs
        - As leaves wilt, they turn dull green and then brown while still attached to stem
        - Bark of affected twigs become dark brown
- Camellia Flower or (Petal) Blight
    - Affects only the flowers
    - Infection can occur anytime after petals begin to show color
    - Conditions are most favorable for infection from mid-January on
- Camellia Leaf Gall
    - Caused by fungus, *Exobasidium camellia*

    - Most common in *C. japonica* and *C. sasanqua*
    - Causes little damage to overall health

Cedars (Junipers)

- Cedar-Apple Rust
    - Spores are contained in an orange, gelatinous material exuding from the galls on cedar trees
- Phomopsis Blight

Crape Myrtle

- Most common problem is powdery mildew
- Common on new growth or pruned spouts

Dogwood

- Spot Anthracnose
    - Most serious problem in dogwood
    - Caused by fungus, *Elsinoe corni*
    - Causes spotting of the flowers, leaves, stems and fruit
    - Spots appear as circular to angular dark purple areas

Gardenia

- Sooty Mold: Often coated with the black sooty fungus that grows on the secretions of the white fly insect

Pyracantha

- Fire Blight: well adapted to LA conditions and has relatively few diseases, but fire blight is the most common

Roses

- Black Spot
- Stem Cankers
- Powdery Mildew
    - Serious disease of roses because of high humidity present during the growing season
    - Disease is more severe on roses than many other plants because of young leaves and buds are affected.

Turf Insects

Chinch Bugs

- From study guide booklet, know:
    - Importance and Type of Injury
    - Life History, Appearance, and Habits
    - Hibernation temperatures
    - Primarily pests of St. Augustine grass
    - Egg laying begins in early spring

Sod Web Worm

- From study guide booklet, know:

    - Importance and Type of Injury
    - Life History, Appearance, and Habits

Armyworms

- From study guide booklet, know:
    - Importance and Type of Injury
    - Life History, Appearance, and Habits
- No lawn is immune to armyworm attack
- Lay eggs in clusters on foliage of plants
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Turfgrass Weeds

Annuals

Chickweed (winter)
Sow thistle (winter)
Carolina geranium (winter annual or biennial)
Crab grass (summer)
Goosegrass (summer)
Annual bluegrass (winter)
Henbit (winter)
Chamberbitter (summer)
Purslane (summer)
Spurge (summer)

Perennials

Torpedograss
Dallis grass
Dandelion
Dichondra
Foxtail (summer annual or perennial)
Smut grass
Wild garlic
Broadleaf plantain
Purple nutsedge
Purple cudweed (biennial)
Spurweed
Clovers
Lespedeza
Virginia buttonweed

Wild garlic: plants develop from basal bulb
Spiny amaranth: common in nurseries and holding areas
Crabgrass spreads by rooting at the lower nodes
Dicondra forms mats in lawns and gardens
Spurge is prostrate growing weed

Turf Diseases

Brown Patch

- Caused by the fungus, *Rhizoctonia solani*
- Occurs in late spring or early fall
- St. Augustine grass is damaged by brown patch more than Bermuda grass or zoysia
- Disease development occurs most rapidly between 75°F and 85°F

Gray Leaf Spot

- Causes irregular brown to gray spots on leaf blades of St. Augustine grass

- Develops rapidly with abundant moisture and warm weather
- Noticed first in shaded areas that remain damp for extended periods
- Areas of heavy disease development, grass may have burned or scorched appearance resulting in death or spotting of leaf blades
- Lesions also occur on stems and spikes of affected plants
- Severity is enhanced by excessive Nitrogen fertilizer on some St. Augustine species
- Newly sprigged or rapidly growing grass is more susceptible than well-established grass
- Control:
    - avoid excessive Nitrogen fertilization
    - water during the day so foliage won't remain wet over night
    - turf fungicides control it effectively when applied at 10-day intervals during periods favorable for infection.

<u>Fading-Out and Melting-Out</u>

- problem in lawns where grass thins and become unsightly
- develops rapidly during the summer
- Turf fungi can be cultured from stolons of diseased grass, but reproducing healthy grass is difficult.
    - These fungi cause fading-out on grass weakened by other disease-causing organisms, insect pests or nematodes.

<u>Dollar Spot</u>

- Caused by the fungus, *Sclerotinia homeocarpa*
- Bermuda grass, zoysia and bahiagrass are most severely affected grasses in the South
- Optimum temperatures for development between 70°F and 80°F
- Dollar spot fungus survives unfavorable growing conditions as black sclerotia which appear as paper-thin flakes
    - Sclerotia consist of compact masses of mycelium with a specialized outer coat.
    - Germinate by resuming mycelial growth
    - When maintained with adequate Nitrogen, less dollar spot occurs and recovery is more rapid.

<u>Pythium Blight</u>

- Develops during periods of warm, wet weather
- Only attacks when humidity is high
- Affected spots occur in groups that form streaks
- May be confused with dollar spot, but Pythium blight is more of a red color in the early stages
- Affected blades turn black and become matted together with a greasy appearance
- Young plants in newly seeded areas, may collapse and die, leaving dead spots
- Heavily fertilized rye grass is often attacked

<u>Thatch Build-Up</u>

- Accumulations of fallen clippings and dead leaves (thatch), provide favorable environment for micro-organism buildup

- Regular mowings that remove only short clippings that dehydrate quickly do not contribute to thatch build-up

Fairy Rings

- Mushrooms in lawn/turf that appear in a circle or semicircle
- Mushroom producing fungi develop on organic matter in the soil and produce fruiting structure on the outer limits of the colony, causing circular effect
- Grass is often greener inside the ring because of available nutrients released by decomposition
- Control is not necessary
    - Condition is usually temporary
    - Difficult to get fungicides to the mushroom producing fungi

Slime Molds

- Fungi that develop mostly during warm, moist weather
- Most common slime mold, *Physarum cinereum*
    - Found on turfgrass
    - Occurs as dark gray to black crust like material
- Derive nourishment from decaying organic matter
- Under certain conditions, they move upward on sticks, stones, grass blades, etc to produce spores
- They do not feed on green places
- Cause no damage other than shading
- Remove from lawn by apply water under pressure or by brushing off with a broom

Rust

- Most damaging during mild, warm weather
- Plants have a chlorotic appearance and stands may be thin
- Zoysia and over-seeded ryegrasses are more affected than St. Augustine grass or Bermuda grass

Nematodes

- Nematodes
    - are tiny roundworms
    - approximately 1/50 of an inch long
    - have spear-like structure in the mouth that punctures plant cells and consumes cell sap
    - injury not only removes cell contents but opens up points of entry for other organisms that infect or devitalize roots.
- Injury appear as areas of low fertility even when fertilizers have been applied
- Nematodes feeding on roots reduce the plant's ability to absorb water and nutrients
- They are rarely completely eliminated from soil, but populations can be reduced to allow for normal plant growth
- Good cultural and fertilization practices may help to overcome injury

Iron Chlorosis

- Results from iron deficiency in soil
- Iron may not be available because of an alkaline soil reaction

- Corrected by applying iron sulfate
- Symptoms include yellowing of foliage and/or green and yellow streaking. In extreme conditions, leaves are solid yellow.

Potential Phytotoxicity

- Pesticide damage to plants
- Results in abnormal growth, leaf drop, and discolored, curled and spotted leaves
- If severe, the plant will die
- Often mimics such things as insect damage, plant disease and response to poor growing conditions (insufficient moisture, improper fertilization)
- Plant damage more likely to occur with the use of herbicides

Drift Problems

- Plants with varying susceptibilities to pesticide damage that grow close together require that applicators working in ornamentals and turfgrasses be especially aware of drift problems

Persistence

- Persistent pesticides are those that stay in the environment for relatively long periods of time
- Directly related to the makeup of the chemical, rate of application, soil type/texture, temperature, moisture conditions
- Herbicides used for pre-emergent weed control in turf usually persist for 60-90 days
- Herbicides used for post-emergent weed control can last for 1-2 days to 3-4 weeks depending on the specific herbicide

Minimize Pesticide Hazards to the Environment

- Read and understand the entire section (page 16 of LSU AgCenter study manual)