

UNIVERSITY OF CENTRAL FLORIDA  
LANDSCAPE & NATURAL RESOURCES  
STANDARD OPERATING PROCEDURE

LNR SOP  
601

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Last Modified: 02/2/2016

**Subject: Pesticides Herbicides and Fertilizers**

Approved: Patrick Bohlen

PROCEDURE:

**Pesticides Herbicides and Fertilizers**

INTENDED  
AUDIENCE:

Landscape and Natural Resource (LNR) Spray Technicians with  
Florida State 482 licensure.

PURPOSE:

To document areas with chemical application and to alert  
fellow groundskeepers of treated areas.

**I. Knowledge –**

Pesticide Applicators must have a 482 license and be familiar with the use of cultural, biological, and chemical procedures that are environmentally compatible and economically feasible to reduce pest populations to tolerable levels. In addition, it is essential that Pesticide Applicators are knowledgeable and contribute to the Integrated Pest Management (IPM) plan (See attachments).

**II. Safety**

- a. All Pesticide Applicators must have a 482 license.
- b. Only Authorized Pesticide Applicators or Supervisors should be in the chemical mixing and loading area.
- c. Personal Protective Equipment (PPE) should be worn at all times.
- d. Chemical spills are to be reported to Environmental Health and Safety (EHS) for guidance on clean up procedures.

**III. Proper Outcome**

Turf and beds do not show signs of nutrient stress or disorders, have minimal weeds and pests, and have good fertility.

**IV. Chemical Mixing (General)**

**Note:** Before starting mixing operations, read all instructions regarding product use and wear appropriate PPE.

**Note:** Pesticide Applicators must mix, apply, and clean tanks per label instructions

- a. Fill the sprayer unit tank 1/3 to 1/2 full with clean water.
- b. Mix only the amount of chemical you plan to use immediately.

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- c. Add required quantity of chemical and top with more water.

**WARNING: Never put chemicals in the tank before the water. This action may cause product loss and bodily injury.**

- d. Start the sprayer unit agitator and continue agitating while filling the tank/s (leave enough room in the tank for product rinse water).  
e. Rinse product containers, measuring cups, and mixing equipment immediately after use and dispose of rinse water in sprayer unit tank.

**Note:** When product residue dries it is hard to remove so rinse out containers as soon as possible. Triple rinse liquid product containers and single rinse product bags.

- f. Replace container caps and close bags of any unused product and place in the storage room/area.  
g. Before proceeding to the area to be sprayed, wash gloved hands to remove any chemical product so the gator cart does not become contaminated.

**V. Chemical Mixing (Back Pack Sprayer)**

**Note:** Before starting mixing operations, read all instructions regarding product use and wear appropriate PPE.

**Note:** Pesticide Applicators must mix, apply, and clean tanks per label instructions

- a. Fill the back pack sprayer unit tank 1/3 to 1/2 full with clean water.  
b. Add spray indicator dye.

**Note:** Spray indicators must be used when treating weeds for the following reasons:

Identifies sprayed product to grounds staff and supervisors  
Minimizes/eliminates over spray onto desirable plants in the beds  
Ensures proper coverage of chemical onto weeds or plant material

- c. Mix only the amount of chemical you plan to use immediately.

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- d. Add required quantity of chemical and top with more water (leave enough room in the tank for product rinse water).

**WARNING: Never put chemicals in the tank before the water. This action may cause product loss and bodily injury.**

- e. Rinse product containers, measuring cups, and mixing equipment immediately after use and dispose of rinse water in sprayer unit tank.

**Note:** When product residue dries it is hard to remove so rinse out containers as soon as possible. Triple rinse liquid product containers and single rinse product bags.

- f. Replace container caps and close bags of any unused product and place in the storage room/area.  
g. Before proceeding to the area to be sprayed, wash gloved hands to remove any chemical product so the gator cart does not become contaminated.

**VI. Application Schedules and Product Use**

The table below outlines the schedules for herbicide, fertilizer and pesticide.

**Note:** Turf applications include all irrigated turf. These applications will not be completed around pond buffers and non-irrigated turf such as the frontages.

**HERBICIDES**

<i>Beds</i>	<i>Turf</i>
<b>Spring (March, May)</b>	
Targeted post-emergent herbicide on weeds.	Broadcast post-emergent mixed with pre-emergent herbicide.
Apply a pre-emergent herbicide and water in to activate (if needed).	March: Apply "complete" granular fertilizer (all species)
Check all plants for mites and insects and spray accordingly.	May: Apply slow release nitrogen and iron fertilizer (all species)
March: Apply granular fertilizer	
<b>SUMMER (June)</b>	
Targeted post-emergent herbicide on weeds.	Targeted post-emergent herbicide on weeds.
Apply a pre-emergent herbicide and water in to activate (if needed).	Broadcast pre-emergent herbicide.

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Check all plants for pest and fungus, and spray accordingly.	Check turf for pest and fungus, and spray accordingly.
	Apply "complete" granular fertilizer (only Bermuda species)
<b>FALL (September)</b>	
Targeted post-emergent herbicide on weeds.	Targeted post-emergent herbicide on weeds.
Apply a pre-emergent herbicide and water in to activate (if needed).	Broadcast pre-emergent herbicide.
Check all plants for pest and fungus, and spray accordingly.	Check turf for pest and fungus, and spray accordingly.
Apply granular fertilizer	Apply "complete" granular fertilizer (all species)
<b>WINTER (December)</b>	
Targeted post-emergent herbicide on weeds.	Targeted post-emergent herbicide on weeds.
Apply a pre-emergent herbicide and water in to activate (if needed).	Broadcast pre-emergent herbicide.
Check all plants for pest and fungus, and spray accordingly.	Check turf for pest and fungus, and spray accordingly.

**FERTILIZER:**

<b>Beds</b>	<b>Turf</b>	<b>Palm Trees</b>
<b>SPRING (March)</b>		
60% Synthetic 10-10-10/minors/40% Non-synthetic Sludge filler (up to 2 pounds/1000 square feet); Bio-fertilizer	70% Synthetic 16-0-8/minors/ 30% Non-synthetic sludge filler/ 0.38% pre-emergent or Bi-Fen (300lbs/acre); Summer Application: Bio-fertilizer	Palm Fertilizer: 8-2-12 + 4% Mg, with micronutrients, Synthetic (0.5 to 1 pound to 1 inch trunk dia.)
<b>SUMMER (June)</b>		
None	Non-synthetic Sludge filler (300lbs/acre) Synthetic /Liquid Fertilizer: 50% SRN 18-3-6/ 6% Fe 3-0-9 + Bio	Palm Fertilizer: 8-2-12 + 4% Mg, with micronutrients, Synthetic (0.5 to 1 pound to 1 inch trunk dia.)

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	(Bermuda; up to 2 gallons/50gal/water)	
<b>FALL (September)</b>		
60% Synthetic 10-10-10/minors/40% Non-synthetic Sludge filler (up to 2 pounds/1000 square feet) Bio-fertilizer	70% Synthetic 16-0-8/minors/ 30% Non-synthetic sludge filler/ 0.38% pre-emergent; or Bi-Fen (250lbs./acre);	Palm Fertilizer: 8-2-12 + 4% Mg, with micronutrients, Synthetic (0.5 to 1 pound to 1 inch trunk dia.)
<b>WINTER (December)</b>		
None	None	None

**PRE-EMERGENT HERBICIDE**

Trade Name	Active Ingredients	Comments
<b>Barricade 65 DG, or Regalkade 0.5G</b>	Prodiamine	Fairly broad spectrum weed control including annual grasses, spurge, chickweed, henbit, oxalis and others. Granule (Regalkade G) is much safer than the spray (Barricade). Only a few bedding plants are on the label.
<b>Pendulum 2G</b>	Pendimethalin	Fairly broad spectrum weed control including annual grasses, spurge, chickweed, henbit, oxalis and others. Granular formulation much safer than spray. Safe on many herbaceous ornamentals.
<b>Surflan, XL</b>	Oryzalin, Oryzalin + Benefin	Broad spectrum weed control. Injurious to many bedding plants. The granular formulation (XL) is much safer than the spray

**POST EMERGENT HERBICIDE**

Trade Name	Active Ingredients	Comments
Fusilade II	Fluazifop-P	This is a post-emergent herbicide for annual grass and perennial weed control.
Lontrel	Clopyralid	This post-emergent herbicide controls certain broadleaf weeds in turf and ornamentals grasses in nurseries and landscapes.

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Image

Imazaquin

This product is a pre-emergent or post-emergent herbicide for annual grasses, broadleaf weeds, and sedges.

**INSECTICIDE**

**Sevin 80wsp**

Carbaryl

This broad-spectrum insecticide kills as a contact and stomach poison. Carbaryl is used to manage armyworms, leaf-feeding beetles, caterpillars, centipedes, cutworms, loopers, millipedes, pillbugs and sowbugs.

**Safari 20 Sg**

Dinotefuran

Safari Insecticide, a super-systemic insecticide with quick uptake and knockdown, controls a broad spectrum of ferocious and invasive pests.

**Orthene Turf& Ornamental**

Acephate

organophosphate: It is labeled for many insects in greenhouses and nurseries, including fire ants

**Tempo Sc Ultra**

Cyfluthrin

pyrethroid ester: This is broadly labeled for insects in greenhouses, nurseries, and landscapes.

**FUNGICIDE**

Daconil Ultrex

Chlorothalonil

This fungicide controls powdery mildew, black spot, and rust, to name a few. Great for use on ornamentals, fruits, and vegetables.

Fore or Protect,  
Pentathlon

Mancozeb

This fungicide is widely used in the ornamental industry. It is labeled for use on numerous crops and pathogen species.

Heritage

Azoxystrobin

This product is labeled for greenhouse, nursery, and landscape for downy mildew, fungal leaf spots, powdery mildew, root rots, and rust control on annual, perennial,

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bedding, and flowering potted plants as well  
as woody ornamentals.

**VII. After Spraying Operations**

- a. Clean out spray unit tank per label instructions.
- b. Return spray unit to storage area.

## **Landscape & Natural Resources**

### **Integrated Pest Management Committee**

***Members: Alaina Bernard, Sam Stanchina, Jimmy DeJesus, Tim Haduch, Ramon Donis, Mark LaHive, Tom Conlon, Ray Jarrett, Dan George***

#### **1. What is IPM?**

*IPM focuses on long-term prevention of pests or their damage by managing the ecosystem*

*Addressing environmental factors that affect the pest and its ability to thrive – create conditions that are unfavorable*

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

The IPM approach can be applied to both agricultural and non-agricultural settings, such as the home, garden, and workplace. IPM takes advantage of all appropriate pest management options including, but not limited to, the judicious use of pesticides. In contrast, *organic* food production applies many of the same concepts as IPM but limits the use of pesticides to those that are produced from natural sources, as opposed to synthetic chemicals.

#### **2. How do IPM programs work?**

IPM is not a single pest control method but, rather, a series of pest management evaluations, decisions and controls. In practicing IPM, growers who are aware of the potential for pest infestation follow a four-tiered approach. The four steps include:

- **Set Action Thresholds (When do we Act?)**

Before taking any pest control action, IPM first sets an action threshold, a point at which pest populations or environmental conditions indicate that pest control action must be taken. Sighting a single pest does not always mean control is needed. The level at which pests will either become an economic threat is critical to guide future pest control decisions.

- **Monitor and Identify Pests**

Not all insects, weeds, and other living organisms require control. Many organisms are innocuous, and some are even beneficial. IPM programs 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. Tracking success of treatments are a component of monitoring as well.

- **Prevention**

As a first line of pest control, IPM programs work to manage the crop, lawn, or indoor space to prevent pests from becoming a threat. In an agricultural crop, this may mean using cultural methods, such as rotating between different crops, selecting pest-resistant varieties, and planting pest-free rootstock. These control methods can be very effective and cost-efficient and present little to no risk to people or the environment.

- **Control**

Once monitoring, identification, and action thresholds indicate that pest control is required, and preventive methods are no longer effective or available, IPM programs then evaluate the proper control method both for effectiveness and risk. Effective, less *risky* pest controls are 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 spraying of non-specific pesticides is a last resort.

Control Options: Biological, Cultural (reduce pest establishment, etc.), Physical/Mechanical (hand weeding, mulch, barriers), and Chemical

## **What is a pest?**

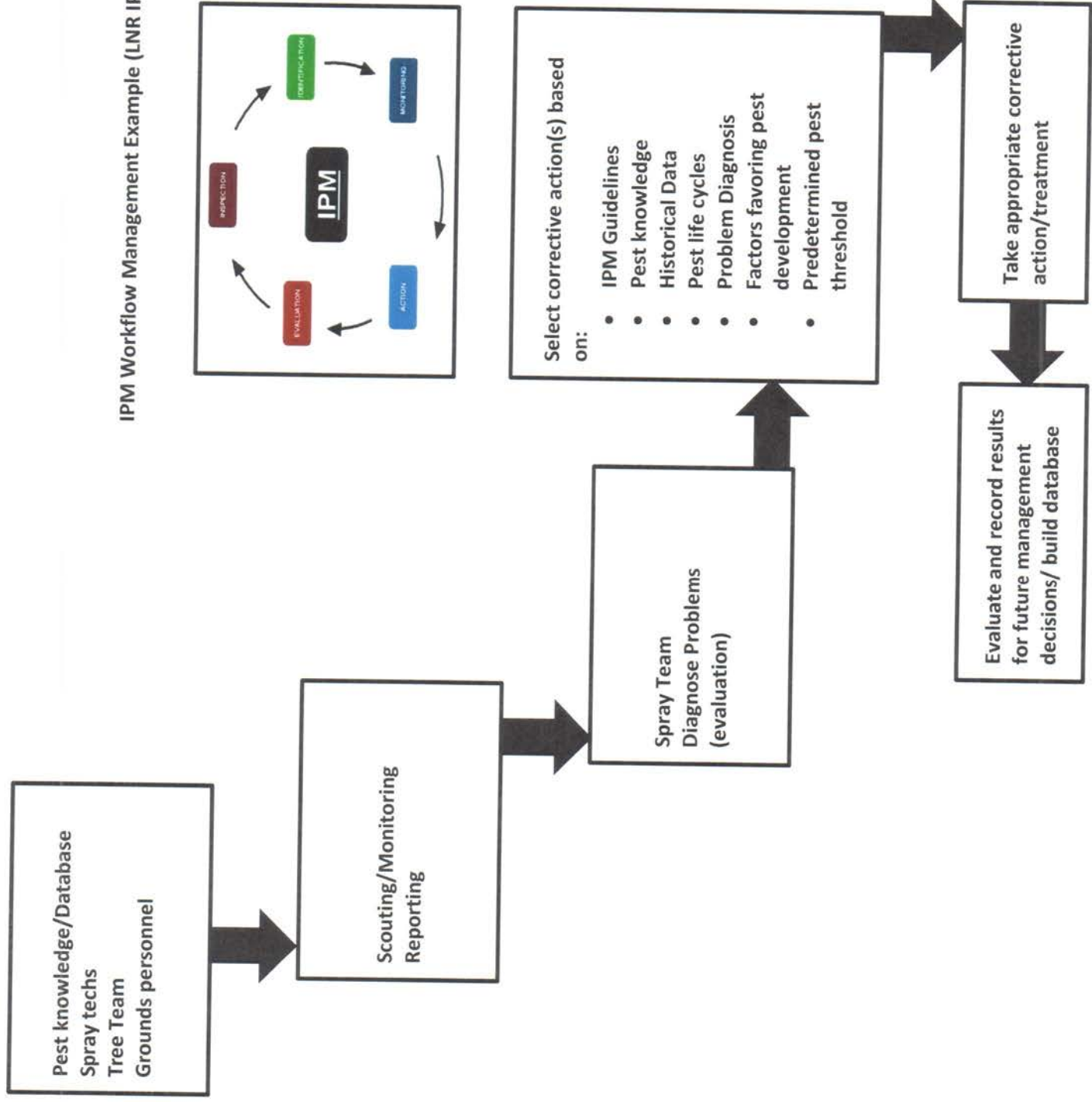
*Pests are organisms that damage or interfere with desirable plants or aesthetics, or impact human or ecosystem health.*

*Identification of biological factors contributing to infestations are necessary for IPM success.*

## **Our goals & thoughts:**

- Action Thresholds (2 meetings)
  - Identify pest on campus and acceptable limitations

IPM Workflow Management Example (LNR IPM Committee)



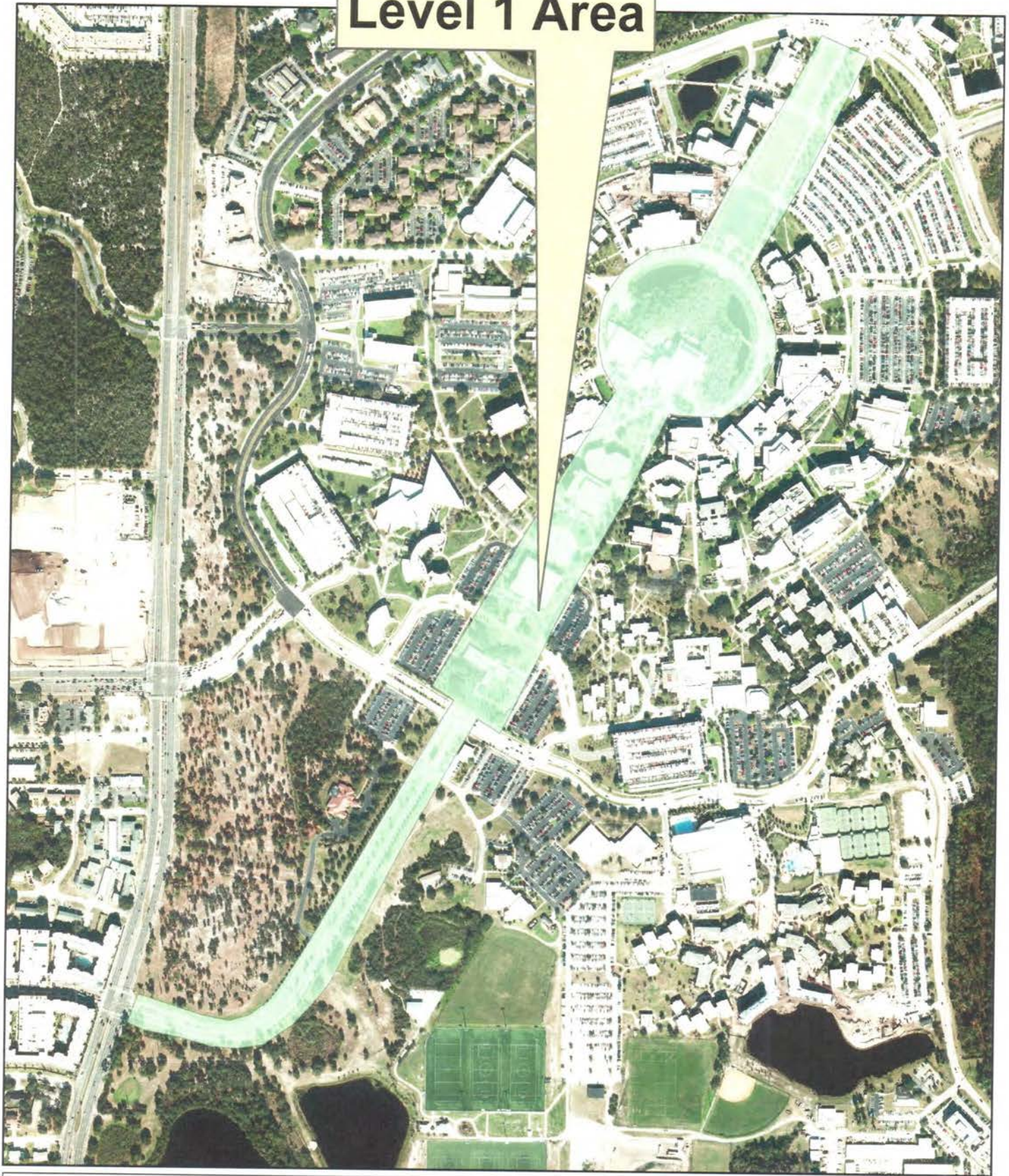
# Plant Material Inspection Sheet

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## Plant Material Inspection Sheet

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# Level 1 Area



0 0.05 0.1 0.2 0.3 0.4 Miles

