

# Soil and leaf tissue analysis and other resources to assist you develop your plant nutrition program.

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# Usefulness of leaf tissue testing

- Necessary to formulate an “efficient” fertilizer program.
- This snapshot of plant nutrient status is a diagnostic tool that allows you to determine a nutritional program to maximize yield and fruit quality.
- Diagnostic sampling-used when a nutritional problem is suspected / to confirm nature of visible symptoms or detect symptomless conditions .
- Predictive sampling- evaluates the effectiveness of fertilizer program for current year and data is used to adjust for subsequent year.

# Nutrient composition of leaves is dynamic...

- Soil moisture.
- Native soil.
- Fertilizer practices.
- Leaf age.
- Variety.
- Cultural practices (weed control, pruning).

# Recommended procedure for collecting samples for nutrient analysis in groves

- Collect a representative sample of at least 15 to 20 trees.
- Trees should be of same age, variety, growing in relatively same uniform soil of similar fertility.
- Leaves from the middle of the current or latest flush. Collect both leaf and petiole.
- Collect at total of 60 to 100 leaves (about 10 leaves per tree) from non-fruiting shoots spaced around the tree. Do not pick more than 2 leaves from any one shoot.
- Leaves at edge of grove/field may be coated with soil particles/dust and should be avoided.
- Avoid collecting diseased or insect damaged leaves.

# When should I collect a sample in avocado?

- Sample mid-shoot leaves of most recent flush in September/October when leaves are 5 to 7 months old.
- Avoid sampling recently pruned trees (sample before pruning in fall).
- Take leaves from a 3 to 7 ft height from all sides of the tree.
- Confine individual leaf samples to one cultivar.
- Confine individual leaf samples to one soil type.
- Confine individual leaf samples to trees under similar cultural practices.

# Collecting samples for nutrient analysis in vegetables

- A proper leaf sample should consist of about 60 to 100 individual leaves.
- Sample should not contain any root or stem material.
- The same leaf (i.e., physiological age and position) should be removed from each sampled plant.
- For sweet corn or onions, the leaf is removed just above the attachment point to the stalk or bulb.
- For compound leaves (carrots, peas, tomatoes, etc.), the whole leaf includes the main petiole, all the leaflets and their petioles.
- Plants damaged by pests, diseases, or chemicals should be avoided.

# Collecting samples for nutrient analysis in vegetables continued...

- Individual plants, even side-by-side, may have a considerably different nutrient status. Therefore, by sampling a sufficiently large number of plants, the error due to this variability can be minimized.
- For a nutrient deficiency diagnosis, one composite tissue sample should be collected from the area exhibiting the disorder and a second sample from otherwise "normal" plants for comparison.

# Sample preparation

- Rinse fresh leaves thoroughly with distilled or deionized water.
- Unless leaves are washed the analysis will report what is in on the leaves and NOT what is in them.
- If testing for micronutrients wash leaves with a weak detergent solution and rinse thoroughly with DI water.

# Plant tissue sample

-Place washed leaves in clean paper bag and dry at room temperature or send immediately to lab.

-Never send fresh samples in plastic bags.

-Be sure to label bags with Sample id #.

-Include name of grower, block/field, host plant, variety, history.



A brown paper bag with a label form. The form has five rows of text with horizontal lines for writing:

- NAME OF GROWER \_\_\_\_\_
- ADDRESS \_\_\_\_\_
- TYPE OF FRUIT \_\_\_\_\_
- VARIETY \_\_\_\_\_ AGE \_\_\_\_\_
- SAMPLE IDENTIFICATION NUMBER \_\_\_\_\_

# Laboratories for soil and plant tissue testing

## *A & L Laboratory*

1301 Copans Rd  
Pompano Beach, FL 33064  
(954) 972-3255

<http://al-labs-plains.com>

-drop off at Atlantic Fertilizer

## *Thornton Labs*

1145 E. Cass St.  
Tampa, FL 33602  
(813) 223-9702

<http://www.thorntonlab.com>

## *UF/ IFAS ESTL*

P.O. Box 110740  
Gainesville, FL 32611

(352) 392-1950 Ext. 221

<http://soilslab.ifas.ufl.edu/>

## *ABC Research Corp.*

3437 S.W. 24<sup>th</sup> St.  
Gainesville, FL 32605

(352) 372-0436

<http://abcr.com/>

# Submitting insect and disease samples

- Plant Diagnostic Clinic is located at TREC. Visit them at <http://trec.ifas.ufl.edu/> or call (305) 246- 7001 ext. 270
- Services include analysis of plant material for bacterial, fungal, viral, and nematode pathogens as well as the identification of insect pests.
- The Clinic promotes a "Test, Don't Guess" attitude. Knowing the causal agent prior to taking action allows for more efficient use and selection of control methods.
- The cost is 20.00.

# Properly collecting a plant sample for disease or insect diagnosis

- Collect whole plant from root to stem.
- Dig the plant out of the soil as opposed to pulling it out of the ground. Pathogens structures on roots are delicate.
- If possible collect more than one plant. Including healthy plants with your sample can make diagnosis easier.
- Collect plants that show a range of symptoms.
- Keep collected plants as fresh as possible.
- Keep foliage from becoming contaminated with soil. Microorganisms can colonize plant material.

# Disease or insect sample collection suggestions

- Do not mix different samples in the same submission bag. Moisture from root samples will contribute to the decay of foliage samples if they are mixed together.
- All samples must be accompanied with a completed Plant Clinic Diagnostic Form. These are available at all county Extension offices or on-line.
- Complete a separate form for each sample and plant problem.
- Remember to note most recent pesticide history on the Plant Diagnostic Form.

# Submitting a disease or insect sample



Institute of Food and Agricultural Sciences  
Tropical Research and Education Center  
Florida Extension Plant Diagnostic Clinic

**\$20.00  
PER SAMPLE**

## Plant Diagnostic Form (3 Steps)

FILL IN ALL 3 STEPS and SUBMIT ORIGINAL COPY WITH SPECIMEN

### STEP 1: YOUR CONTACT INFORMATION - Please Print Clearly

Today's Date: \_\_\_\_\_

Name: \_\_\_\_\_ Company: \_\_\_\_\_

Address: \_\_\_\_\_ City/Zip: \_\_\_\_\_

County: \_\_\_\_\_ Phone(s): \_\_\_\_\_ Cell: \_\_\_\_\_ Fax: \_\_\_\_\_

Email: \_\_\_\_\_

In addition to submitter send results to:

Name: \_\_\_\_\_ Company: \_\_\_\_\_

Address: \_\_\_\_\_ City/Zip: \_\_\_\_\_

County: \_\_\_\_\_ Phone(s): \_\_\_\_\_ Cell: \_\_\_\_\_ Fax: \_\_\_\_\_

Email: \_\_\_\_\_

Circle one of the following: Commercial Grower    Consultant    Research    Home Grower

### STEP 2: GENERAL HOST PLANT & SYMPTOM INFORMATION - Please Print Clearly

Host Plant: \_\_\_\_\_ Cultivar: \_\_\_\_\_

General Plant Appearance:  wilted  spotted  yellowed  abnormal growth  stunted  mosaic  
 other: \_\_\_\_\_

Part(s) of Plant Affected and Symptom(s) Expressed

<input type="checkbox"/> Roots	<input type="checkbox"/> Trunk	<input type="checkbox"/> Stem	<input type="checkbox"/> Branch	<input type="checkbox"/> Leaves	<input type="checkbox"/> Flowers	<input type="checkbox"/> Fruit
<input type="checkbox"/> apparently normal	<input type="checkbox"/> galls/swelling	<input type="checkbox"/> galls/swelling	<input type="checkbox"/> galls/swelling	<input type="checkbox"/> spotted	<input type="checkbox"/> spotted	<input type="checkbox"/> spotted
<input type="checkbox"/> poor growth	<input type="checkbox"/> cankers	<input type="checkbox"/> cankers	<input type="checkbox"/> cankers	<input type="checkbox"/> blighted	<input type="checkbox"/> blighted	<input type="checkbox"/> blighted
<input type="checkbox"/> discolored	<input type="checkbox"/> discolored int.	<input type="checkbox"/> discolored int.	<input type="checkbox"/> discolored int.	<input type="checkbox"/> yellowed	<input type="checkbox"/> discolored	<input type="checkbox"/> discolored
<input type="checkbox"/> rotted	<input type="checkbox"/> dieback	<input type="checkbox"/> dieback	<input type="checkbox"/> dieback	<input type="checkbox"/> mosaic	<input type="checkbox"/> rotted	<input type="checkbox"/> rotted
<input type="checkbox"/> stubby	<input type="checkbox"/> rotted	<input type="checkbox"/> rotted	<input type="checkbox"/> rotted	<input type="checkbox"/> wilted	<input type="checkbox"/> mosaic	<input type="checkbox"/> mosaic
<input type="checkbox"/> galls/swelling	<input type="checkbox"/> abnormal pattern	<input type="checkbox"/> abnormal pattern	<input type="checkbox"/> abnormal pattern	<input type="checkbox"/> galls/swelling	<input type="checkbox"/> distorted	<input type="checkbox"/> distorted
<input type="checkbox"/> other	or number	or number	or number	<input type="checkbox"/> rotted	<input type="checkbox"/> other	<input type="checkbox"/> other
	<input type="checkbox"/> wilted	<input type="checkbox"/> wilted	<input type="checkbox"/> wilted	<input type="checkbox"/> other		
	<input type="checkbox"/> other	<input type="checkbox"/> other	<input type="checkbox"/> other			

Other: \_\_\_\_\_

### STEP 3: PLANT PRODUCTION & HISTORY OF PROBLEM - Please Print Clearly

Type of Planting:  Field  Interior  Forest  Garden  Grove/Orchard  Landscape  Nursery  Greenhouse

Symptom(s) Prevalence:  Entire Planting  Localized Area  Scattered Area

Symptom(s) Appeared (In Past):  Days \_\_\_\_\_  Weeks \_\_\_\_\_  Months \_\_\_\_\_

Recently Applied Chemicals: Fertilizer: \_\_\_\_\_

Pesticide: \_\_\_\_\_

# UF Distance Diagnostic and Identification System

<http://www.ddis.ifas.ufl.edu/ddisx/home.jsp>

The web-based **D**istance **D**iagnostic and **I**dentification **S**ystem (DDIS) for Extension was developed jointly by extension agents, specialists and the faculty of UF/IFAS Information Technology.

DDIS provides a collaboration and communication tool for first detectors, extension specialists and diagnosticians to share information on plant insects and diseases.

The system uses field data and digital media as tools for enhancement of diagnosis of plant disease, insect, weed, invasive species, plant management, physiology, and nutrient problems.