

Citrus Nutrition Management Program

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UF/IFAS Citrus Research and Education Center

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Program Rationale

- Good nutrition practices can help HLB-affected trees
- No one size fits all!
- HLB-affected trees respond to intensive fertilizer management
 - Healthy trees could withstand stress better but HLB-affected trees decline faster with any stress
- HLB-affected trees benefit from spoon-feeding
- Regular nutrient sampling helps in assessing trees nutritional needs
- With regular sampling, the fertilizer program can be tweaked to ensure that trees demands are being met

Program Purpose

- Good fertilizer program can be effective in managing HLB-affected trees
- Provide a resource to commercial citrus growers
- Assist in developing a customized nutrition management program



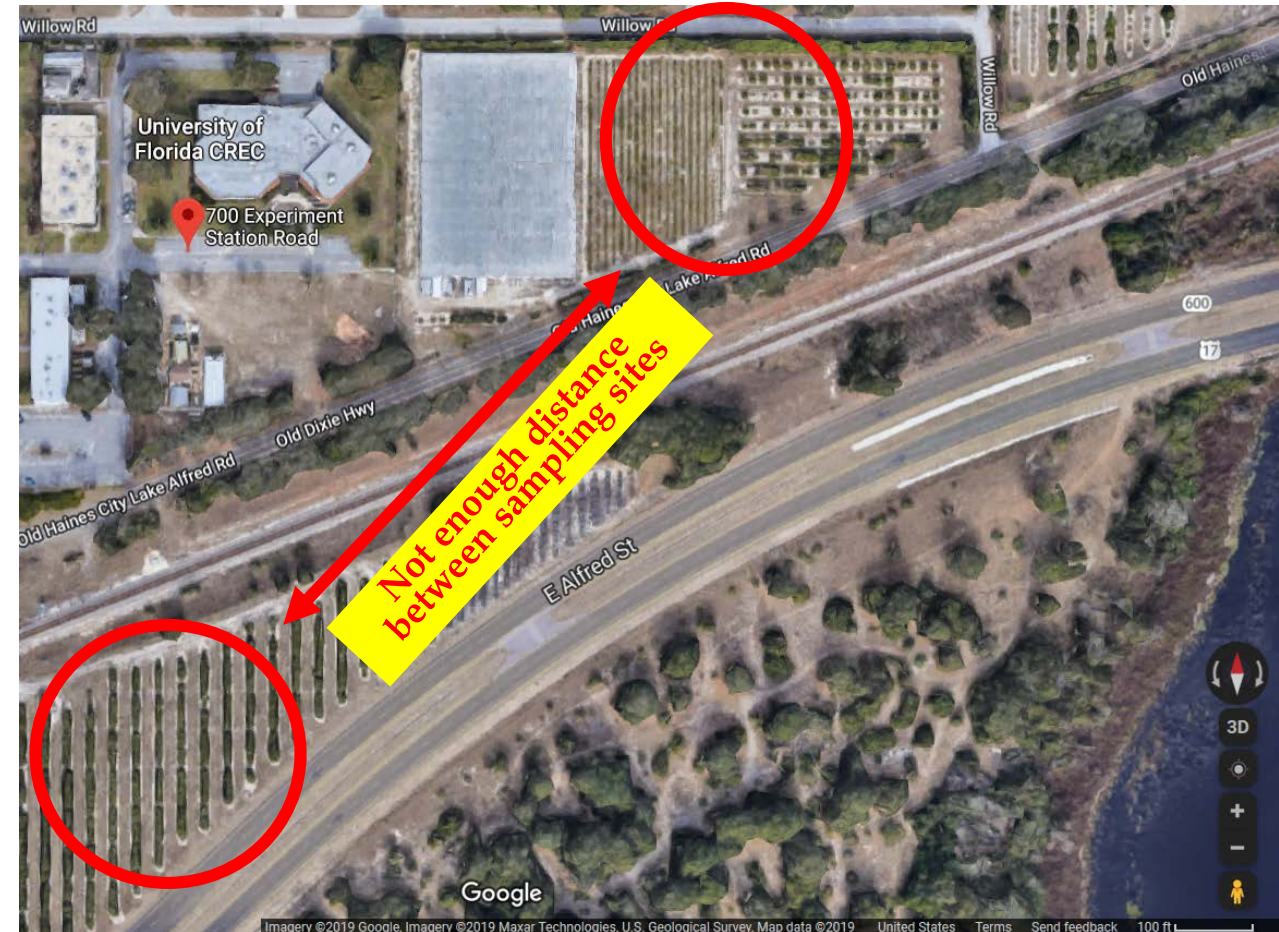
Requirements

- Commercial citrus grower
- Must have a minimum of 5 acres
- Grove must be located in Florida
- Sample collection must come from the same grove for the entire duration of the program
- One box per person



Requirements-Multiple Representatives

- Multiple representatives from the same company
 - One box per person, but each box must be a separate grove site
 - Three box limit per company
- Preferred locations be in different counties; if not, must be 10-15 miles apart
- Not a continuous block or adjacent block
- Boxes will be numbered for each location based on information provided on form, please **do not** mix samples
 - *Consistency is key to creating the individualized nutrient management program for each site.*



By having distance between the grove sampling sites, it will show the effectiveness of the program.

How does the program work?

- Collaboration between growers and UF
- Program operates from October 2019- November 2020
- Lab services are provided at no charge to the grower
- Only cost for the grower is the shipping cost
 - Samples may be dropped off in person to the lab, however, still use the labeled envelopes
 - Central Florida Soil Laboratory, Bartow



How does the program work?




- Growers
 - Growers receive a nutrition box kit with a unique identifying number
 - Growers will collect samples and mail to lab
- UF
 - Will receive results from lab
 - Twice a month UF faculty and Extension agents will meet to make recommendations
 - Will send results and recommendation to grower for the next quarter
 - Will send collection sample reminders every 3 months



Getting Started

- Complete form
 - Contact information must be grower or grove manager
- Receive box with your unique ID number
- Within the next week, you will receive an email confirming your participation in the program



UF IFAS Extension UNIVERSITY of FLORIDA			Citrus Nutrition Management Program		
Grower/Grove Manager Contact Information					
First Name			Last Name		
Mailing Address					
City		State		Zip Code	
Phone Number			Email		
Company			Please do not write here.		
Nutrient Sampling Site					
Grove Size (please circle one)		5-10 acres		11-20 acres	
Scion/Variety			Rootstock		
Tree Age			Grove Location (Florida County)		
Which photo below best describes your grove tree health? Please circle only one.					
					
Would you like to receive the All In for Citrus monthly newsletter via email? <input type="checkbox"/> Yes <input type="checkbox"/> No					

Grove Selection

- Uniform scion/rootstock
- Bearing age trees, preferred
- Don't select severely declined trees



Mild; PAR: 151



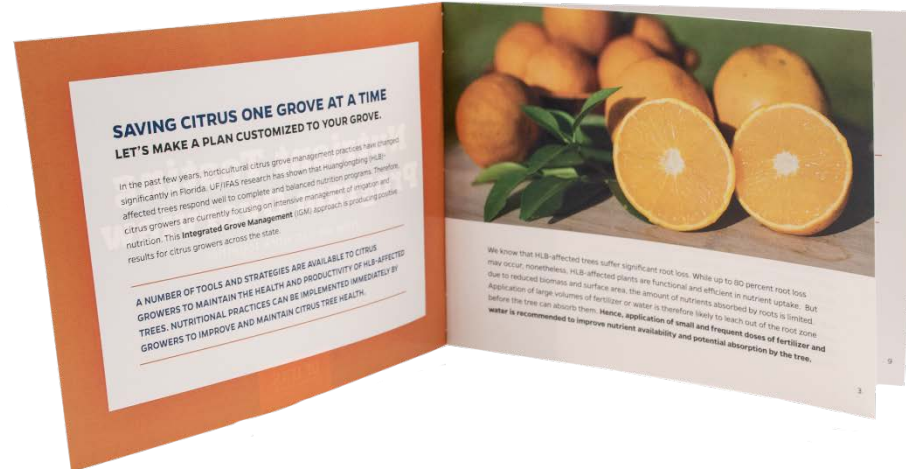
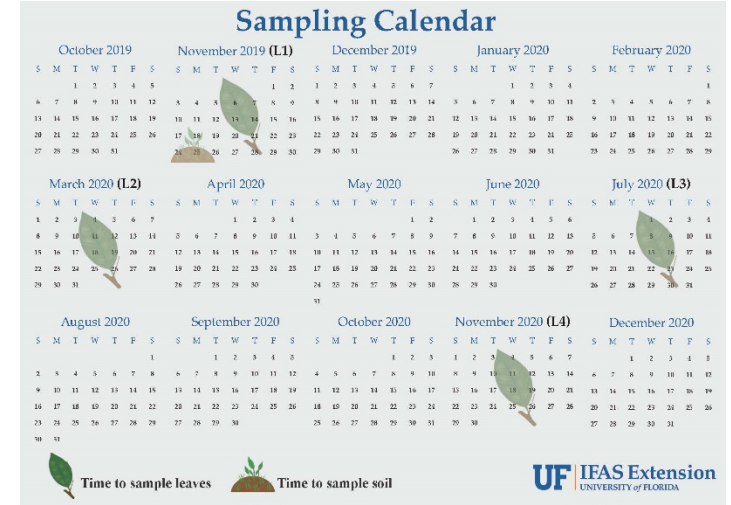
Moderate; PAR: 313



Severe; PAR: 410

What's in the box?

- Nutrient Testing Program Overview
- Sampling Calendar
- Resources



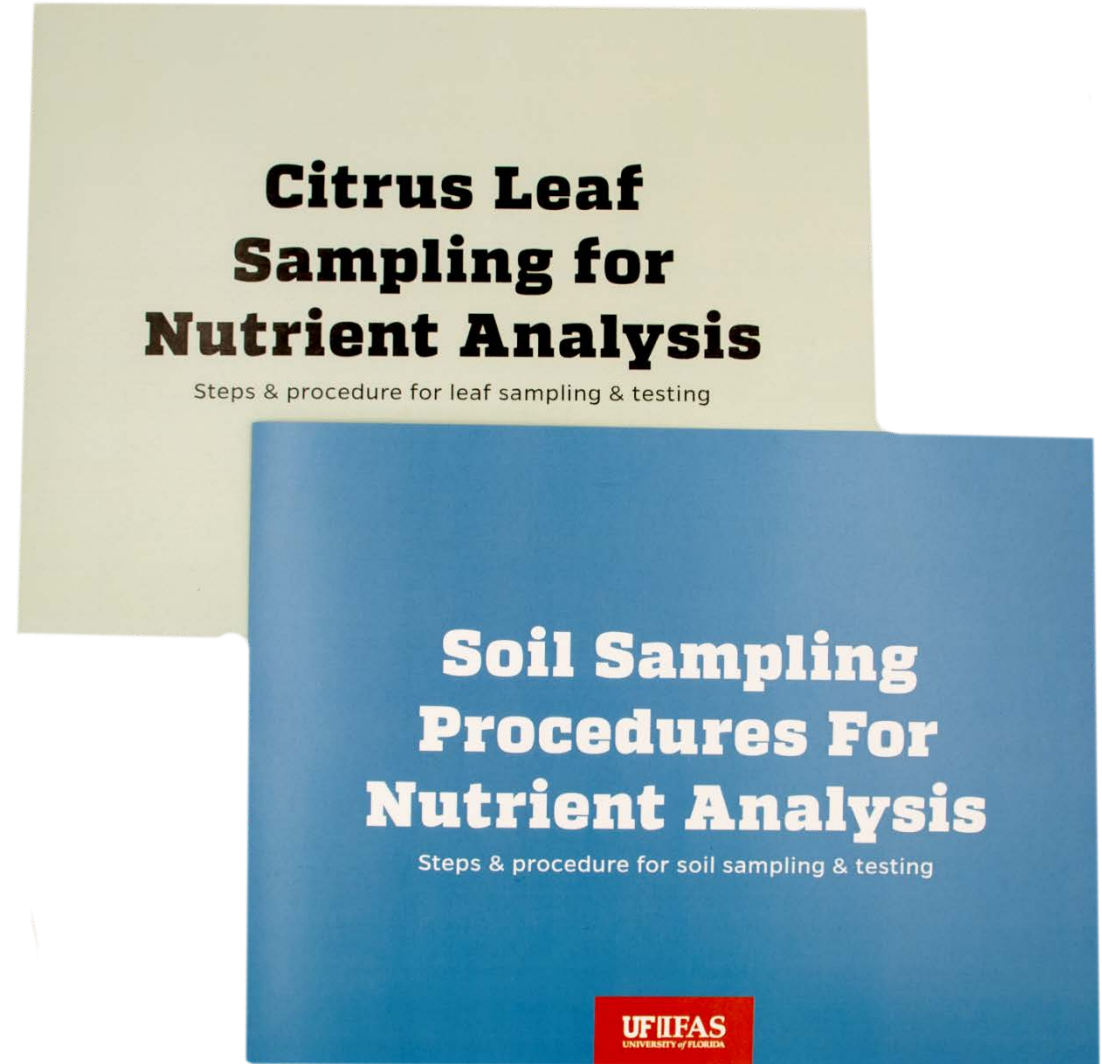
What's in the box?

- Four brown paper bags for leaf sample (L1, L2, L3, L4)
- Four shipping envelopes for leaf samples
- Zip top bag for soil collection (S)
- Shipping box for soil sample



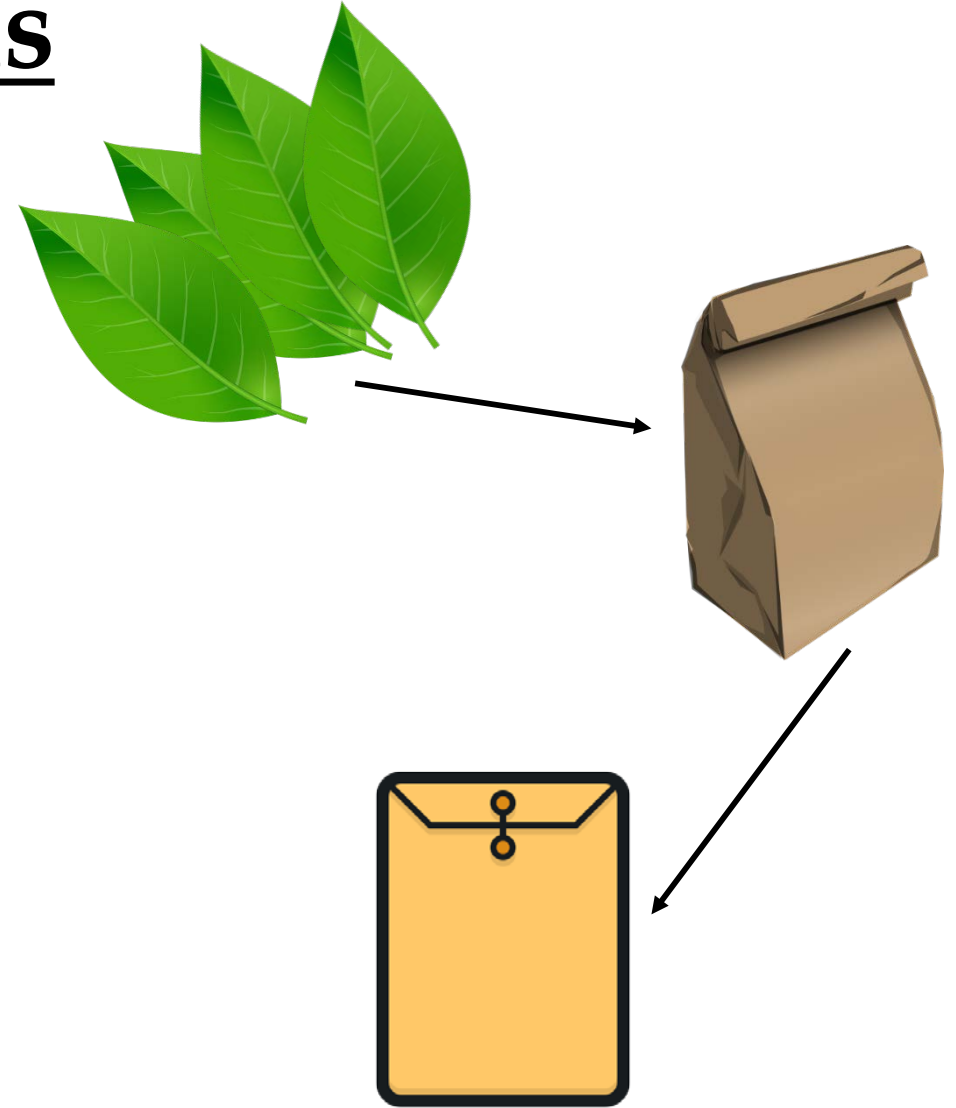
What's in the box?

- Citrus Leaf Sampling for Nutrient Analysis
- Soil Sampling Procedures for Nutrient Analysis



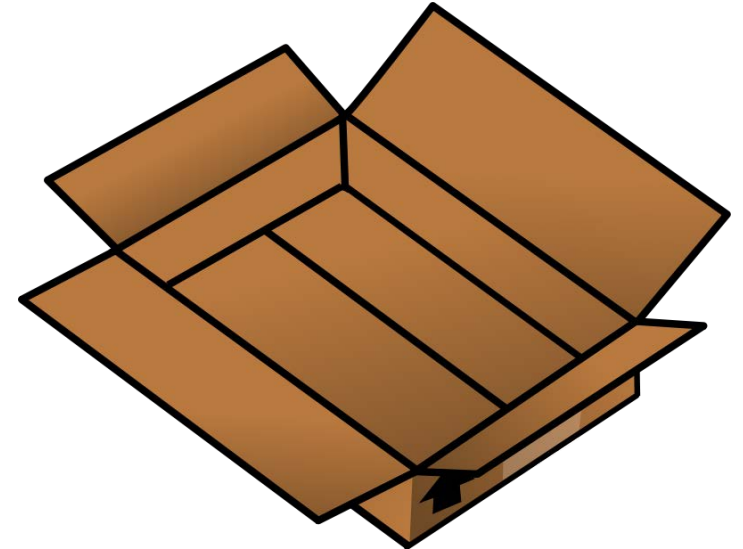
Leaf Sampling Instructions

- Place leaves into brown paper bag
 - L1: November 2019
 - L2: March 2020
 - L3: July 2020
 - L4: November 2020
- Insert brown paper bag into pre-addressed padded envelope
- Mail package as soon as possible



Soil Sampling Instructions

- Place soil into clear zip top bag
 - S: November 2019
- Insert zip top bag into pre-addressed box
- Mail package as soon as possible



Results

- Results will be sent via email
 - citrusnutrition@ifas.ufl.edu

LEAF ANALYSIS										
	N	P	K	Mg	Ca	B	Zn	Mn	Fe	Cu
	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm
Lab Results	1.93	0.13	1.35	0.23	2.92	51.52	50.54	54.14	49.92	10.41

SOIL ANALYSIS												
	P	K	Mg	Ca	S	B	Zn	Mn	Fe	Cu	CEC	pH
	lbs/A	lbs/A	lbs/A	lbs/A	lbs/A	lbs/A	lbs/A	lbs/A	lbs/A	lbs/A	meq/100g	
Lab Results	83	72	423	1910	72	0.48	19.82	7	17	10.59	7.42	7

Recommendation for next quarter per acre	N	P	K	Mg	Ca	B	Zn	Mn	Fe	Cu
	Add 50lb/acre	no change	Add 50lb/acre	Add 10lb/acre	Add 20lb/acre	Add 1/3lb per acre	Add 3 lb/acre	Add 3 lb/acre	Add 1.5 lb/acre	no change

Goal

- Goal is to have all nutrient levels within the suggested range

Guidelines for interpretation of orange tree leaf analysis based on 4 to 6-month-old spring flush leaves from non-fruiting twigs (Koo et al., 1984)							
Element	Unit of Measure	Deficient	Low	Optimum	High	Excess	Suggested Range for HLB ³
N	%	<2.2	2.2 - 2.4	2.5 - 2.7	2.8 - 3.0	>3.0	2.6-2.9
P	%	<0.09	0.09 - 0.11	0.12 - 0.16	0.17 - 0.30	>0.30	0.14-0.23
K	%	<0.7	0.7 - 1.1	1.2 - 1.7	1.8 - 2.4	>2.4	1.45 - 2.10
Ca	%	<1.5	1.5 - 2.9	3.0 - 4.9	5.0 - 7.0	>7.0	3.5 - 6.00
Mg	%	<0.20	0.20 - 0.29	0.30 - 0.49	0.50 - 0.70	>0.70	0.35 - 0.60
Mn	mg/kg or ppm	<18	18 - 24	25 - 100	101 - 300	>300	50 - 150
Zn	mg/kg or ppm	<18	18 - 24	25 - 100	101 - 300	>300	50 - 150
Cu	mg/kg or ppm	<3	3 - 4	5 - 16	17 - 20	>20	10 - 18
Fe	mg/kg or ppm	<35	35 - 59	60 - 120	121 - 200	>200	90 - 160
B	mg/kg or ppm	<20	20 - 35	36 - 100	101 - 200	>200	68 - 150

These are suggestions for HLB-affected trees based on the field observations, these ranges have not been scientifically proven yet.

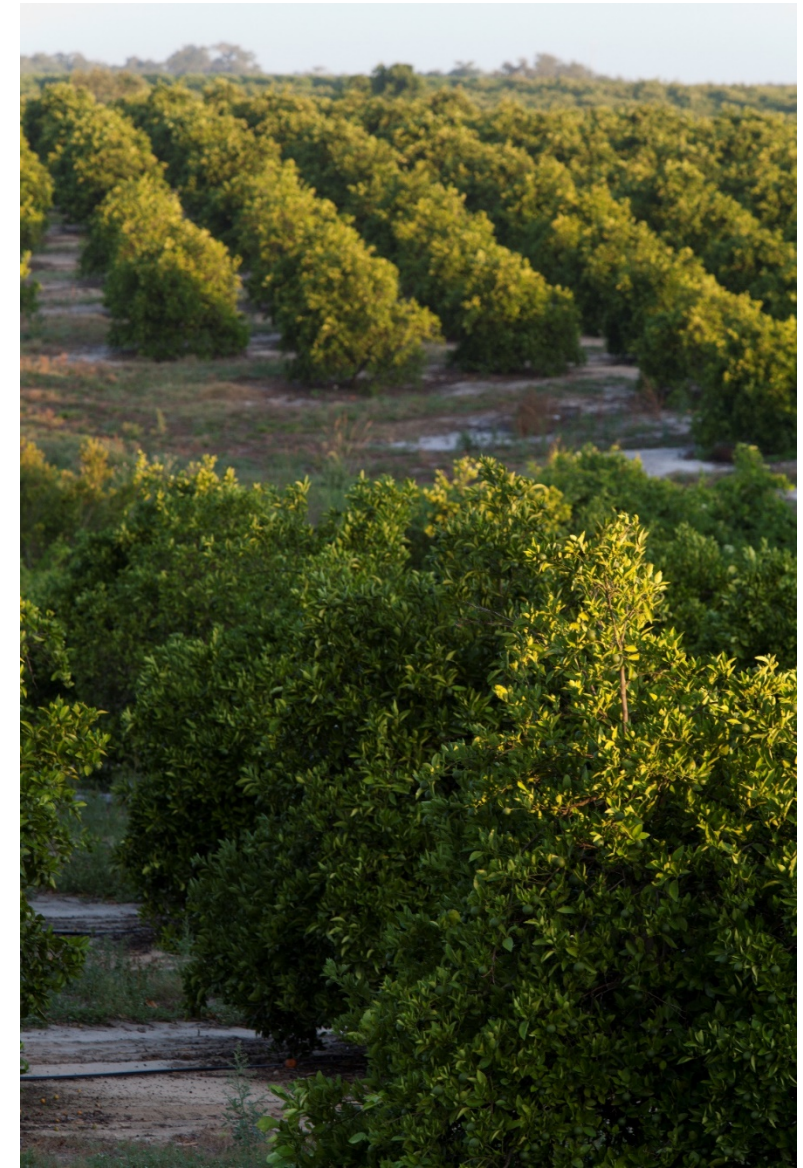
If you have questions about recommendations...

Your extension agent will be the point of contact

- Laurie Hurner lhurner@ufl.edu
- Chris Oswalt wcoswalt@ufl.edu
- Juanita Popenoe jpopenoe@ufl.edu
- Amir Rezazadeh amir2558@ufl.edu
- Matt Smith smith197@ufl.edu
- Mongi Zekri maz@ufl.edu
- citrusnutrition@ifas.ufl.edu

Value of the Program

- Personalized nutrition management plan for one year
- Demonstration of the effectiveness of regular leaf sampling and developing customized fertilizer program
- Intensive nutrient management should improve productivity
- Monetary value = 4 leaf nutrient test and 1 soil nutrient test > \$ 120



Questions and Answers

- Can a consultant or sales rep get a box on behalf of a grower?
 - Yes, but the contact information on the form must be the grower's contact information.
 - Number of boxes are limited; priority given to those who attend meetings
- Who will see my information?
 - The information you provide will be kept confidential within the University of Florida. Any information used to present data research will be anonymous.

Any questions?

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