UNIVERSITY OF FLORIDA | EXTENSION
Institute of Food and Agricultural Sciences
Hendry County Extension • P.O. Box 68 • LaBelle, Florida 33975-0068 • (941) 674-4092

Flatwoods Citrus

Vol. 4, No. 7 July 2001		Mongi Zekri, Multi-County Citrus Agent, SWF

UPCOMING EVENTS

Citrus Expo

Date: August 22-23, 2001, **Location:** Lee Civic Center, Fort Myers
For more information, call Dr. Bob Rouse at 941 658 3400

Annual meeting of the Florida Associations of Extension Professionals (FAEP)

Date: September 10-14, 2001, **Location**: West Palm Beach

Florida Agricultural Conference & Trade Show (FACTS)

Date: October 1-5, 2001, **Location:** Lakeland Center, Lakeland
For more information, call Dr. Ed Stover at 561 468 3922

47th Annual Meeting of the Interamerican Society for Tropical Horticulture

Date: October 1-5, 2001, **Location**: Cuernavaca/Oaxtepec, Morelos, Mexico
For more information, go to www.isth.cjb.net or contact Dr. Richard Campbell, Executive Secretary-Treasurer at Fax: 305 665 8032, E-mail: rcampbell@fairchildgarden.org

Hendry County Extension Ag Tour

Date: December 8, 2001
For more information, call Inez at 863 674 4092

Leaf analysis

Management practices to improve fertilizer efficiency include evaluation of leaf analysis data and selection of fertilizer formulation to match existing conditions. Leaf analysis was demonstrated and proven to be an extremely useful tool for detecting nutritional problems and evaluating fertilizer programs for citrus trees. Leaf analysis integrates all the factors that might influence nutrient availability and uptake. It shows the balance between nutrients and identifies hidden or incipient deficiencies. Leaf samples must be taken at the proper time and in the proper way for the analysis to be meaningful and representative of the block. Therefore, standard procedures for leaf sampling have to be followed because improperly collected leaf samples may provide misleading information about the nutritional status of the trees and the fertilizer programs. Since nutritional levels within the tree and leaves are continually changing, the time for sampling must be selected when leaf nutrient levels are relatively stable and best reflect the nutrient needs of the trees. For mature tree blocks, if leaf samples are taken yearly, the best time would be in July and August to collect 4-6-month-old spring flush leaves.

If taken later in the season, the summer flush would probably be confused with the spring flush. Each leaf sample should consist of 80-100 spring flush leaves taken from non-fruiting twigs of 15-20 uniform trees of the same cultivar and rootstock, and under the same fertilizer program. The best indication of successful fertilizer management practices is having the leaf analysis data within the satisfactory range listed in the Table below. See page 4 for more details on sampling and handling of leaf samples.

Satisfactory range of leaf mineral elements for mature citrus trees

Nitrogen (N)	2.50-2.90 %		Boron (B)	36-120 ppm
Phosphorus (P)	0.12-0.17 %		Zinc (Zn)	25-100 ppm
Potassium (K)	1.20- 1.70 %		Manganese (Mn)	25-100 ppm
Magnesium (Mg)	0.30-0.50 %		Iron (Fe)	60-120 ppm
Calcium (Ca)	3.00-5.00 %		Copper (Cu)	6-16 ppm
Sulfur (S)	0.20-0.40 %		Molybdenum (Mo)	0.1-1.0 ppm
Sodium (Na)	< 0.25 %		Chloride (Cl)	< 0.50 %

Special Thanks to the following sponsors of the Faltwoods Citrus Newsletter for their generous contribution and support. If you would like to be among them, please contact me at 863 674 4092

Susan S. Thayer
Maxijet, Inc.
8400 Lake Trask Rd.
P.O. Box 1849, Dundee, FL 33838
Phone: 800 881 6994
Fax: 800 441 6294

Lonnie Pell
SePRO *Corporation*
600 River Moorings Drive
Merritt Island, FL 32953
Phone: 321 455 9833
Fax: 321 455 1664

Mike Raines
Griffin LLC
13171 Lake Meadow Drive
Fort Myers, FL 33913
Phone: 941 274 3102
Fax: 941 274 6663

Jerry Southwell
Hydro Agri
574 Green Ash Lane
Wauchula, FL 33873
Phone: 941 773 0154
Fax: 941 773 5088

Jack Zorn
Florida Favorite Fertilizer
P.O. Box 1466
Moore Haven, FL 33471

Robert M. Bancroft
Citrus Hedging, Inc.
P.O. Box 1366
LaBelle, FL 33975
Phone: 863 675 2190
Fax: 863 675 2104

FARM CREDIT
SOUTHWEST FLORIDA
330 N. Brevard Ave.
Arcadia, FL 34266
Phone: 800 307 5677
Fax: 941 494 6460

Rachel Martin
***AVENTIS* CropScience**
Phone & Fax: 941 415 6987
Mobile: 941 707 1198

E-mail:
rachel.martin@aventis.com

Bobbitt Jenkins
BASF Corporation
11100 Lakeland Circle
Fort Myers, FL 33913
Phone: 941 561 2812
Fax: 941 561 6985
Mobile: 941 707 1603 AGNET #6652

SAMPLING TECHNIQUES FOR LEAVES

▲Immature leaves should be avoided because of their rapidly changing composition.

▲Trees at the edge of the block and at the end of rows should not be sampled because they may be coated with soil particles and dust or have other problems.

▲Do not include diseased, insect damaged, or dead leaves in a sample. Use good judgment.

▲Select only one leaf from a shoot and remove it with its petiole (leaf stem).

DIAGNOSING GROWTH DISORDERS

▲Collect samples from both affected trees as well as normal trees.

▲Trees selected for sampling should be at a similar stage of development and age.

▲Avoid dead or severely damaged leaves.

▲Whenever possible, confine the sampling area to trees in close proximity to each other.

HANDLING OF LEAF SAMPLES

▲Samples should be collected in paper bags, protected from heat (stored in portable ice chests), and placed in a refrigerator for overnight storage if they cannot be washed and oven dried the same day of collection.

▲For macronutrient analysis, leaves usually do not need to be washed. Leaves should be dried in a ventilated oven at 60-70 ^{o}C.

PREPARATION FOR ANALYSIS

▲Leaves that have been recently sprayed with micronutrients for fungicidal (Cu) or nutritional (Mn, Zn) purposes should not be analyzed for those micronutrients.

▲For accurate Fe and B or other micronutrient determination, samples would require hand washing, which is best done when leaves are still in a fresh condition.

▲For micronutrients determination, the leaves should be washed with a detergent and rinsed with tap water, then rinsed in diluted hydrochloric acid (5%) solution and finally rinsed 3 times with distilled water. It is difficult to remove all surface residue even with the acid rinse, but this procedure removes substantially most of it.

Soil analysis

Soil analysis is an important method for gaining basic information regarding the chemical status of soils. It is useful in formulating and improving a fertilizer program. Soil tests are mainly important for pH, cation exchange capacity (CEC), phosphorus, calcium, magnesium, and copper. Soil tests for the relatively mobile and readily leached elements such as N and K in Florida soils are of no value. Soil analysis is particularly useful when conducted over several years so that trends can be seen, solid information can be gathered, and proper adjustment of fertilizer programs can be achieved. Procedures for proper sampling, preparation and analysis have become standardized for meaningful comparisons and interpretations. If soil samples are collected once a year, the best time would be at the end of the summer rainy season and prior to fall fertilization, usually during September and October. However, soil sampling may be conducted at the same time as leaf sampling (July-September) to save time and reduce cost. Each soil sample should consist of 15-20 soil cores taken at the dripline of 15-20 trees within the area wetted by the irrigation system to a depth of 6 inches. The area sampled should be uniform in terms of soil and tree characteristics and correspond to the area from which the leaf sample was taken. To draw accurate conclusions from soil tests, consistency in soil analysis in adopting the same methodology and extracting solution is very important.

Special Thanks to these sponsors of the Flatwoods Citrus Newsletter for their generous contribution and support. If you would like to be among them, please contact me at Phone 863 674 4092, Fax: 863 674 4636, or maz@gnv.ifas.ufl.edu

Donna Muir Strickland
MONSANTO
P.O. Box 1723
LaBelle, FL 33975
Phone: 863 675 4250
Fax: 863 674 0282

John W. Coley
Irrigation maintenance,
Spot herbiciding,
Young tree care,
& Tree planting services
Phone: 941 290 9373

Wayne Simmons
SIMMONS CITRUS NURSERY
1600 Hwy 29 South
LaBelle, FL 33935
Phone: 863 675 4319
Fax: 863 675 6963

Ed Early
DU PONT Ag. Products
5100 S. Cleveland Ave., Suite 318-368
Fort Myers, FL 33907
Phone: 941 332 1467
Fax: 941 332 1707

Robert F. Gregg
SYNGENTA
11051 Championship Drive
Fort Myers, FL 33913
Phone: 941 561 8568
Fax: 941 561 8569

FIRST BANK
P.O. Box 697
LaBelle, FL 33975
Phone: 863 675 4242
Fax: 863 675 1099
Moore Haven: 863 946 1515

AIRWORK
Aerial Spraying
Fixed Wing & Helicopter
P.O. Box 5100
Immokalee, FL 34143
Phone: 941 657 3217
Fax: 941 657 5558

Soil pH

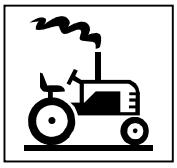
The optimum soil pH range for citrus trees is between 6 and 7. Trifoliate hybrid rootstocks such as citrumelos and citranges do better at the low end of this pH range. For sandy soils, one ton of liming material such as dolomite will generally raise the soil pH by about one unit. Liming is economically sound and essential for profitable crop production. Soil pH must be monitored every year through soil testing because development of soil acidity is a continuous process that requires repeated applications of liming materials. Always test your soil before liming. Do not assume that lime is needed. Certain soils in southwest Florida already contain excess lime. Such soils will typically have pHs between 7 and 8.

When soil pH is high because of naturally occurring lime such as limestone, marl, and seashells, there is no practical, economical way of lowering the soil pH. Under these conditions, tolerant rootstocks to high pH soils should be selected to reduce nutritional disorders and deficiency problems. Sulfur added to soil can reduce the soil pH through the help of bacteria which transform elemental sulfur to sulfuric acid. However, the soil pH can return to its original value as soon as sulfuric acid is used up.

Benefits of liming to correct soil acidity

--Increased nutrient availability
--Improved fertilizer use efficiency
--Increased soil microbial activity
--Higher nitrogen fixation by legumes
--Reduced toxicity of copper
--Provision of additional amounts of calcium and magnesium
--Improved soil physical conditions
--Increased cation exchange capacity
--Improved herbicide activity
--Increased growth and crop yield

The Eleventh Annual Farm Safety Day held on Saturday 2 June 2001 was a big success.



Over the past few years, The Farm Safety Day has been proven to be a very effective way in providing an educational opportunity for farm equipment operators and workers.

Certificates of appreciation were sent to the
2001 Farm Safety Day Sponsors

Mark Colbert, A. Duda & Sons, Inc. ($200.00)

W. Bernard Lester, Alico, Inc. ($200.00)

Jack Paul, Bob Paul, Inc. ($100.00)

Certificates of appreciation were also sent to the
2001 Farm Safety Day Speakers

Dr. Paul Midney, Collier Health Services, Immokalee
Addy Chadid, Jack M. Berry, Inc., LaBelle
Cesar Asuaje, UF - IFAS Palm Beach County Extension Office
Ofelia Dimas, Bethune Education Center, Immokalee

Congratulations to the winners of the 2001 equipment operators contest and to their respective companies!

1st place: **Crawford Floyd**, Wheeler Farms
2nd place: **Jose Hernandex**, David C. Brown Farms
3rd Place: **Reynaldo Cantu**, Six L's

Trophies were given to the winners. Engraved plaques were given to their respective companies. The big trophy will stay for one year at the company that has the 1st place winner.

Citrus Tristeza

Citrus tristeza virus (CTV) is a well-known citrus virus disease causing tree losses and crop reduction in most citrus-growing areas of the world. Tristeza means sadness in Spanish. CTV was first reported in Florida in the early 1950s, but serious losses were not experienced until the 1980s after the widespread of the sour orange decline strains. In Florida, CTV is known primarily to cause tree decline and stunting on trees budded on sour orange and *Citrus macrophylla* rootstocks. The brown citrus aphid, which is the most efficient vector of CTV, was first detected in Dade and Broward counties in the fall of 1995 and rapidly spread in 1996 throughout the Florida citrus growing areas. About 20% (18 to 20 million trees) of the producing citrus trees are on sour orange rootstock. About 12 years ago, propagation on sour orange rootstock was discontinued in Florida. In southwest Florida, a sharp increase in the decline rate of trees on sour orange rootstock has been experienced since the spring of 1998. The virus is spread by infected trees or budwood and by aphids. Many strains of tristeza exist and vary greatly in the severity of symptoms they produce. Mild strains of CTV produce essentially no noticeable symptoms in their hosts. Severe strains can cause decline on sour orange rootstock. The decline CTV strains block the phloem (conducting tissue located in the bark through which sugars produced in the leaves by photosynthesis are moved to roots) and girdle the tree. Death of the phloem at the bud union results in over-growth of the scion at the bud union, destruction of feeder roots, stunting, leaf chlorosis, wilting, reduced fruit size, poor growth, dieback, and tree death. Declining trees on sour orange rootstock may also exhibit pinhole pitting or honeycombing on the inner face of the bark or brown discoloration at the bud union. The most virulent CTV strains are those causing stem-pitting (deep pits in the wood) in the trunk and branches of scions regardless of rootstock resulting in trees with low vigor and reduced fruit set, size, and quality. For many years, in several parts of the world including Florida, mild-strain cross-protection by deliberately introducing mild strains into a tree in order to protect it from severe strains has been conducted. The results were not consistent. However in certain cases, mild strain cross protection provided some protection against decline on sour orange rootstock and extended the economic life of groves. Inoculation with mild isolates must be done prior to trees being exposed to aphid inoculation with severe isolates. CTV strains causing decline on sour orange rootstock are abundant in Florida. Strains that cause stem pitting have not been reported from commercial citrus in Florida, but there is some evidence that stem pitting strains exist in some old line Meyer lemons and other imported mandarins. Mandarins are considered tolerant to CTV, but mandarins imported from countries where stem pitting is common is the primary source of stem pitting isolates for orange and grapefruit trees. Removal of declining trees on sour orange rootstock and replacement with trees budded on tolerant rootstocks is recommended. Replacement trees must be free of severe strains of CTV.

Tree decline

More about Citrus Tristeza

Citrus tristeza virus (CTV) is the cause of the decline and eventual death of trees on sour orange rootstock. Initially, affected trees have small leaves and twig dieback. Diseased trees often produce a crop of very small fruit. Eventually, large limbs die back and the tree gradually declines. In some cases, trees may suffer from quick decline and wilt and die in a matter of weeks. CTV causes an incompatibility at the budunion, which produces girdling of the tree. Declining trees often show pitting consisting of small holes (honeycombing) on the inside face of a flap of bark of the rootstock removed across the budunion. Quick declined trees may only have a yellow-brown stain at the budunion. Only trees on sour orange rootstock are affected by tristeza decline. Sweet oranges seem to be more affected than grapefruit. Lemons on sour orange rootstock are not affected by tristeza.

Citrus tristeza virus has a wide range of isolates of varying severities. Mild isolates have been widespread in Florida for many years and these have been widely disseminated by aphids and in budwood. Such isolates do not usually cause decline of sweet orange on sour orange rootstock. Over the last 50 years, more severe, decline-inducing isolates have occurred sporadically and caused tree losses in various areas of the state. When propagated on sour orange rootstock, budwood infected with decline-inducing strains often produces stunted trees. The incidence of these isolates has gradually increased, groves on sour are declining rapidly, and many trees on tolerant rootstocks are now infected but show no symptoms.

In some countries, CTV isolates occur that also cause stem-pitting in citrus scions regardless of the rootstock used. Grooves and pits appear in the wood of the trunk, branches, and twigs. Externally, branches may be twisted, ropy, and twigs may become brittle. Trees affected by stem-pitting grow poorly and have low yields and small fruit. Limes and grapefruit are most commonly affected by stem-pitting, but sweet oranges may be affected. Tangerines are generally tolerant. Isolates which cause decline of sweet orange on sour orange may also cause stem-pitting, but many decline isolates produce no stem-pitting in grapefruit or oranges. Again, stem-pitting has not been found in commercial citrus in Florida to date.

Currently, all budwood used for propagation must be free of MCA-13 positive strains. However, MCA-13 positive strains are spreading rapidly in the state, and it may not be possible to continue using field-produced budwood. The key to preventing problems with stem-pitting in Florida is to avoid propagation of stem-pitting isolates.

Unfortunately, there is no single, accurate, rapid procedure to distinguish stem-pitting isolates from other strains. An ELISA procedure has recently been developed to detect sweet orange - stem-pitting isolates, but it does not detect isolates causing stem-pitting on grapefruit. Molecular techniques are being developed for detection of stem-pitting isolates, but currently the only means to detect stem-pitting isolates is by graft inoculation of grapefruit and sweet orange seedlings, which requires 12-15 months.

Tristeza virus is transmitted by aphids in a semi-persistent manner. The aphid can acquire the virus within minutes of feeding on an infected plant and transmit it to healthy plants within minutes after beginning to feed. Aphids lose the ability to transmit the virus within 24-48 hours after leaving an infected plant.

Toxoptera citricida, the brown citrus aphid, which first appeared in Florida in 1995, is the most efficient vector of the virus. *Aphis gossypii*, the cotton or melon aphid, is a less efficient but effective vector. *Aphis spiraecola*, the green citrus or spirea aphid, and *Toxoptera aurantii* are relatively inefficient. The establishment of *Toxoptera citricida* in Florida has resulted in more rapid spread of decline-inducing isolates of tristeza.

Recommendations

Once tristeza-affected trees on sour orange rootstock begin to decline, there is no treatment that will reverse the decline or prevent multiplication of the virus. Generally, individual diseased trees should be replaced with certified trees on tolerant rootstocks as the yields of affected trees decline to uneconomical levels. However, if blocks on sour orange rootstock are planted on inappropriate row spacing, are not properly bedded, or are in need of drainage or other structural work, or the scion variety is not the preferred one, it may be desirable to replace the entire block.

Cross protection, the inoculation of trees with mild strains to protect them from the effects of severe strains, has been effective at extending the economic production against grapefruit stem-pitting strains in South Africa, Australia, and against pitting of sweet orange in Brazil. Cross protection against tristeza decline on sour orange rootstock in Florida is not widely used.

*****Please find enclosed information and an application form concerning Gulf Citrus Growers Association Scholarship Foundation, Inc. Pass the information to who you think he/she meets the criteria and is interested in getting a scholarship.

*****Please also find enclosed, from Ron Muraro, the summary pages for the 2000-01 comparative citrus budgets and the summary of the 2001 citrus caretaker survey.

Gulf Citrus Growers Association (GCGA)

GCGA is a trade association representing citrus growers in southwest Florida (Charlotte, Collier, Glades, Hendry and Lee Counties). Gulf Citrus addresses key issue of economic importance to the sustainable growth and development of the citrus industry of southwest Florida. These issues include land and water use, environmental regulation, farm worker relations, transportation, domestic and international trade and marketing programs. The association is supported by volunteer grower membership and participation and by support from allied trades, agribusiness and associate members. If you are not a member, you need to join GCGA. Call 863 675 2180.

Ron Hamel: Executive Vice President/General Manager
Betsy McGill: Director, Member & Industry Relations
Claire Hudon: Administrative Assistant/Office Manager

2001-2002 GCGA Officers

George H. Austin, President
Stephane Gardinier, Vice President
W. Bernard Lester, Secretary
Greg Carlton, Treasurer

2001-2002 GCGA BOARD OF DIRECTORS

Charlotte County
W.E. “Buddy” Kemper -- J & H Grove Holdings, LC

Collier County
Tom Jones -- Barron Collier Partnerships
Calvin Lloyd, III -- Cooperative Producers, Inc.

Glades County
David Wheeler -- Wheeler Bros., Inc.

Hendry County
Greg Carlton -- Southern Gardens Citrus Groves, Inc.
Mark Colbert -- A. Duda & Sons, Inc.
Dick Crockett -- Bryan Paul Citrus, Inc.
Hugh English -- HUPA, Inc.
Stephane Gardinier -- Gardinier Florida Citrus
W. Bernard Lester -- Alico, Inc.

Lee County
George H. Austin -- George H. Austin, Inc.

At Large Members
Emmett Evans, III -- Evans Properties, Inc.
Billy Heller -- Heller Brothers, Inc.

Gulf Citrus Growers Association Scholarship Foundation, Inc.

TO: Students in ECC Citrus Production Technology or other citrus degree programs

FROM: **Dr. Mongi Zekri, Multi-County Citrus Agent, University of Florida**

RE: Gulf Citrus Growers Association Scholarship Scholarship Foundation, Inc.

An important function of the Gulf Citrus Growers Association Scholarship Foundation, Inc. is support of degree seeking students in Citrus Production Technology or other citrus degree programs to benefit the SW Florida Citrus Industry. The Association has presented one or more $1,000 scholarships annually at the Citrus Expo Banquet to deserving students.

1. ECC/AS and ECC/AA Degrees - Preferred requirements for scholarships are the following:

    a. Completion of all placement testing and a **declared major** in Citrus Production Technology.
    b. Completion of **12 credit hours** with continuous enrollment.
    c. Minimum overall grade point average of **2.50**
    d. **Commitment** to complete the associate in Science or Associate in Art degree in Citrus Production Technology at Edison Community College.

2. BS, MS and PhD Degrees - Preferred requirements for Scholarships are the following:
    a. Completion of all placement testing and a **declared major** in Citrus or Citrus related major.
    b. Completion of **12 credit** hours towards a Citrus degree.
    c. Minimum overall grade point average of **2.50** for BS Degree; **3.0** for MS and PhD Degrees.
    d. Student has demonstrated a **commitment** to complete the degree at a state university or college of higher learning.

Selection of scholarship recipients is made by a scholarship committee, comprised of academic and industry members.

If you meet the above criteria and are interested in applying, please complete the following application attached to this letter.

P. O. Box 1319, LaBelle, FL 33975, (863) 675-2180 / FAX: (863) 675-8087 / Email: gulfcitrus@aol.com

Gulf Citrus Growers Association Scholarship Foundation, Inc.

SCHOLARSHIP APPLICATION

Personal Data

NAME: _____ SS #: _____

Address: _____

City: _____ Zip Code: _____ Phone: _____

EMPLOYER: _____

Address: _____

City: _____ Zip Code: _____

Phone: _____ Fax: _____

Does your employer reimburse you for expenses incurred toward your Degree? Yes____. No __.

Please complete the following questions using complete sentences with as much detail as possible.

Career Goals: _____

_____

_____

_____

Potential Value of your Education to the Citrus Industry in <u>Southwest Florida</u>:

_____

_____

_____

_____

_____

Program Status: Are you working toward a **EEC/AS Degree** __ **ECC/AA Degree** _____

BS Degree ___ **MS Degree** _____ **PhD Degree** _____

UNIVERSITY enrolled: _____

Department: _____

Please provide the information below as to where you are now in your Degree Program:

Courses taken: _____

_____

_____

_____

_____

_____

_____

Total credit hours toward current Degree: _____ **Cumulative Grade Point Average (GPA**): ___

Expected date of Graduation: _____

I authorize the release of this application and any relevant supporting information to persons involved in the selection of the scholarship recipient.

_____ _____

Applicant's Signature Date

APPLICATION DEADLINES ARE MARCH 1st & AUGUST 1ST.

Return completed application to:

Gulf Citrus Growers Association Scholarship Foundation, Inc.
ATTN: Dr. Mongi Zekri
Hendry County Extension Office
PO Box 68
LaBelle FL 33975

Fax: 863 674 4636