TEXAS A&M UNIVERSITY-KINGSVILLE

CITRUS CENTER

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WESLACO, TEXAS 78596

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NEWSLETTER

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CITRUS LEAFMINER ON THE INCREASE

New growth flushes abundant on citrus trees since recent heavy September rains, have been hit hard by citrus leafminer (CLM). In fact, CLM infestations and damage levels have been the highest that I have seen in the last couple of seasons. In some of the Center's citrus blocks it was not uncommon to find 4-6 active CLM larvae per leaf, with mines on both the upper and lower surfaces. Damaged leaves were often curled or showed severe epinasty (Fig. 1). An interesting recent observation is that many of these curled leaves also harbored immature Asian psyllids—newest invader of South Texas citrus. Feeding of the latter pest undoubtedly contributed to the overall severity of foliar damage. I might add that CLM mining was also evident on twigs and fruit—especially the rind or peel of 'Rio Red' grapefruit.

Several beneficial parasites and predators have been observed attacking CLM. Most abundant is the wasp parasite, *Zagrammosoma multilineatum* (Ashmead)—the adult of which is easily recognized by its bright yellow color and stripped appearance (Fig. 1 insert). An internal parasite, it apparently moves from another leafminer host insect species that infests Anaqua (Manzanita) trees, native to South Texas. Predators seen feeding on CLM included—various spiders, lady beetles, fire ants and green lacewings.

Agri-Mek 0.15EC (abamectin) and Micromite 25WS (diflubenzuron) are two commonly recommended chemicals for CLM control that are also relatively easy on beneficials. Effectiveness of each is improved significantly in tank mixes with narrow range 435 petroleum spray oil (0.5-1.5%). Spray timing is very critical, with applications made when newly hatched CLM larvae (1st stage) first begin to appear on new flush foliage. Once the larvae (2nd & 3rd

OLEOCELLOSIS

Oleocellosis (Oleo means oil + cell + osis means abnormal or diseased condition) of citrus fruit is a peel injury caused by mechanical damage in harvesting, transport, or packinghouse treatment. Citrus for the fresh fruit market grown in areas where dew develops on fruit is vulnerable to oleocellosis. It is also known as peel injury or green spot. Mechanical injury causes oil glands to burst and spread the oil. Oil glands with increased turgor pressure (= swollen from water absorption) are easier to break. Citrus fruit is covered with oil glands, for example, Marrs orange and Rio Red grapefruit have around 400 oil glands in one square inch. Oil from one burst gland could spread to the surrounding 6-10 glands. It can be imagined the extent of oil that can be released from an injury equivalent to the size of a thumb. These glands contain several essential oils; however, the predominant one is d-limonene, which constitutes about 80-85% of all the oils. The rest include: terpineol, linalool, and n-decyclic aldehyde.

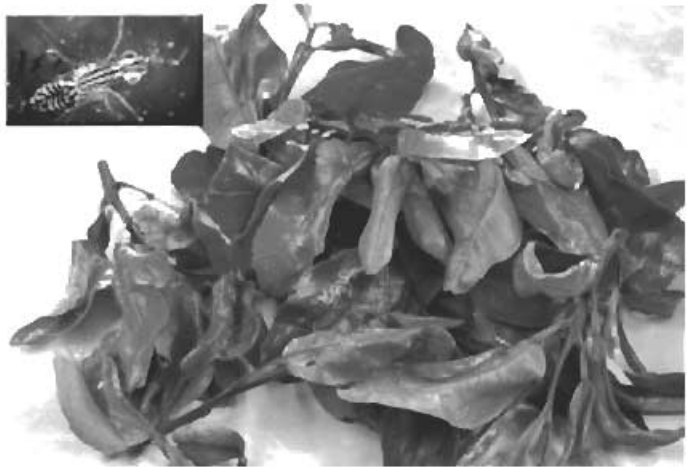
Released oil can damage many cells of the rind, and even those of adjacent fruit that is in contact with the injured fruit. The following precautions would help reduce the oleocellosis problem.

- Train your crews to pick fruit gently
- Avoid picking fruit that are wet as a result of condensation (dew, fog), or rain, and do not pick fruit in the morning under these conditions. Water on the rind increases turgor pressure of gland cells and makes them vulnerable to rupture.
- Encourage your crew to experiment with rind oil release pressure. A rule of thumb is: absolutely avoid picking when less than 3 pounds of pressure required to rupture oil cells, harvest with caution when 3 to 7 pounds pressure is required, and normal harvest when more than 7 lbs required to rupture oil glands.

stage) are feeding and mining the foliage they are much more difficult to kill.

Milbemectin, an analogue of abamectin, is currently included in Citrus Center trials for efficacy against CLM. This new compound with both insecticidal/miticidal activity, has given excellent long term control of citrus rust mite in previous trials. Registration is anticipated in 2004 and the chemical will be marketed under the name Mesa EC, product of Gowan Chemical Co. More data and information on Mesa will be forthcoming in future Citrus Center Newsletters.

J. Victor French



CITRUS TREES IN THE PRESIDENT'S GARDEN

The President of Texas A & M University-Kingsville, Dr Rumaldo Juarez expressed interest in growing some citrus trees in the garden of the President's house in Kingsville. So recently we took three virus-free trees, two Rio Red grapefruit and a Valencia orange, up to Kingsville and planted them in the garden there. Micro-jet sprinklers were installed at the same time so that the trees can be given freeze protection if needed. We hope this operation will bear fruit.

Jose Amador, John da Graca & Elias Hernandez

PHYTOPHTHORA FRUIT ROT

The rain that we received in the month of September 2003 (15.13 inches in Brownsville) was about 10 inches more than that of September 2002. For citrus growers, this level of rain can cause Phytophthora problems. We have already started to see brown rot on fruit and lesions on leaves, especially in lower hanging branches. In normal rainfall years, brown rot is a minor problem in Texas. Two other diseases of citrus caused by Phytophthora are: foot rot and root rot. However, the immediate consequence of rain would be reflected in packingsheds with an increase in fruit with brown rot. Fruit in one packinghouse inspected is free from visual signs of rot. Do not pick fruit from the ground. Observe the lower branches and the orchard floor fruit with brown rot symptoms. Infected fruit will show as light brown discoloration of rind. A white mycelium may develop in the affected area. Brown rot fruit will have an offensive smell. Fruit that become infected prior to harvest may not show symptoms; however, they will develop symptoms in storage and also infect surrounding fruit in the box. A fungicide application in orchards would be helpful to prevent brown rot and also as a proactive approach to reduce foot rot and root rot.

Mani Skaria

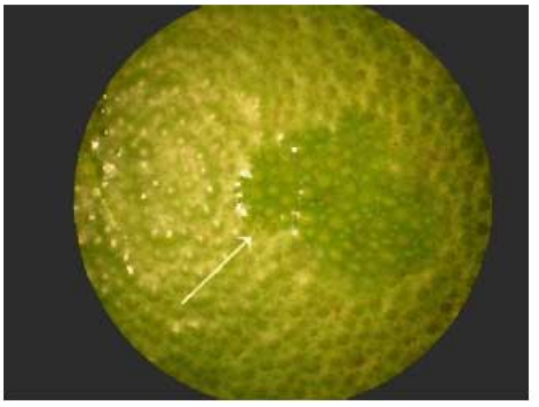
WATER CONSERVATION AND FERTILITY MANAGEMENT STRATEGIES ON CITRUS COST AND PRODUCTIVITY

South Texas has been a major force in the citrus industry for many decades and yet there is still limited scientific information regarding irrigation and fertilizer requirements when placed under water conservation strategies. A field research project is being conducted at the South farm of the Citrus Center. The proposed crop for the study is a fully mature stand of Rio Red grapefruit trees. Limited studies have been undertaken to determine which type of irrigation system would prove to be the best for grapefruit. This study was initiated in 2001 to compare the economic value of drip and micro-spray jet irrigation to traditional flood irrigation. Furthermore, this project will evaluate the effects that compost applications have on soil moisture retention and subsequent crop yield. Similarly different N fertilizer source treatments are being investigated, including a new organic-based fertilizer called Xtend© that is a dry pelletelized form of biosolids containing 17% N. Apart from this, Water-Mark© soil moisture sensors equipped with Watch-Dog© real time data logging equipment and individual water meters were installed to determine soil moisture status within the citrus root zone. Preliminary harvest data was collected in March of 2002 after all trees were flood irrigation over the growing season. It was found that total fruit yield from the designated drip and micro-spray plots were not significantly different from one another prior to initial drip and micro-spray jet irrigation in 2003. Periodic soil and leaf tissue sampling are taken to better evaluate soil N and plant nutrient status throughout the growing season. The 1st year's data will be presented after spring harvest 2004 and the research will involve an economic evaluation of water conservation and fertility management strategies on citrus productivity. This economic study will be performed by **Julien Shantidas**, a Master's student at TAMUK studying agricultural economics. This project is a multidisciplinary approach to resolving current water related issues for the Rio Grande Valley. Other professionals involved with this research include Drs. Kim Jones, Environmental Engineer, TAMUK; Bob Wiedenfeld, Soil Scientist, TAES; and Juan Enciso, Extension Specialist, Texas Cooperative Extension. Grant funded by Rio Grande Basin Initiative, Task 4 On Farm Water Conservation Projects.

Shad D. Nelson, Ph.D.
Asst. Professor of Agronomy, Kingsville

- Do not over fill pellets. Pellets should be free from splintered wood, protruding metal objects (nail, bolts, etc)
- Do not pick fruit that is touching the ground because sand on fruit causes abrasion and oil gland rupture.
- Packing lines should not have sharp corners and/or rough spots, stiff brushes, twigs, etc.
- Fruit kept at higher relative humidity will have less dark spots

We are in the process of developing a kit for the field crew to experiment with the level of pressure required to break oil glands under field conditions (Thanks to Dr. Girija Raman and Ms. Miao Hongqin for assisting with this project).



Marrs orange showing turgid oil glands. The 'wet' area shown by arrow is oil damage from 5 glands.

Mani Skaria

JOHN WATSON ASSUMES RESPONSIBILITY FOR THE BUDWOOD PROGRAM

Following the departure of Craig Kahlke in August, the management of the budwood program has been transferred to John Watson, the Center's Nursery & Field Research Manager. For some time he had been working closely with Craig and has becomc familiar with thc workings of thc program. With the financial support of the Texas Citrus Producers' Board, we will be hiring two assistants, one full-time and one part-time.

Any orders for certified budwood should now be directed to John at (956) 968-2132 or j-watson@tamu.edu

John da Graca

NEW STUDENT FACES AT THE CENTER

The Center welcomed some new students recently. **Kranthi Mandadi**, a native of India, has joined Dr Patil's lab to study for his master's degree, and **Arlene Pacheco** has begun her master's in Dr Louzada's lab - she is a graduate of the University of Texas at Brownsville and is already familiar with the center from her time in the same lab as an undergraduate intern last year. **Rene Palomar**, a student of the University of Texas - Pan American, is now doing an internship in Dr Louzada's lab; he is the first of several UTPA students who will be getting hands-on biotech training at the Center over the next couple of years.

A POSTHARVEST WORKSHOP HELD

A postharvest workshop was held on September 11, 2003 at the Citrus Center. All commercial packinghouses were represented with a total of 20 people in attendance. It was aimed at reviewing the prevalent postharvest problems of citrus fruit, especially that impact the fresh fruit market. Also, it was a forum to discuss issues surrounding pre-harvest management practices in orchards, degreening, and some unique challenges in harvesting and processing citrus fruit. The attendees were also briefed on the latest situation and issues with the state of California on Mexican fruit fly by Ray Prewett of the Texas Citrus Mutual. The program ended with a short review on food safety, followed by lunch. It was pointed out that it would be worth repeating similar programs every year and perhaps separate ones for the packinghouse and field crews. One of the attendees suggested developing a more precise field pressure testing system to reduce oleocellosis problem. (See oleocellosis article in this newsletter)

Mani Skaria

Subscriptions to the bimonthly Newsletter are $5 a year or $8 for two years. International rate is $7 a year. Make checks payable to Texas A&M University-Kingsville. Address comments or inquiries to Newsletter Editor, Texas A&M University- Kingsville Citrus Center, 312 N. International Blvd, Weslaco, Texas 78596 or, in the case of signed articles, directly to the staff member named. Articles appearing in the Newsletter may be reproduced, in whole or in part, without special permission. Newspapers,periodicals and other publications are encouraged to reprint articles which would be of interest to their readers. Credit is requested if information is reprinted.

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