TEXAS A&M UNIVERSITY-KINGSVILLE

CITRUS CENTER

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NEWSLETTER

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MICROMITE 25WS®REGISTERED FOR TEXAS CITRUS

Micromite 25WS®(Product of Uniroyal Chemical) was recently granted a 24-C Special Local Need Registration for use on Texas citrus. Micromite 25WS is labeled at a rate of 1.25 pounds per acre (0.32 lb ai/acre) for control of citrus rust mite and citrus leafminer. The active ingredient in Micromite is Diflubenzuron which is an insect/mite growth regulator. Technically, it is a chitin inhibitor affecting growth and development of immature stages (eggs and larvae), and is somewhat slower acting than many other pesticides that kill rapidly upon pest contract. In our trials with Micromite we obtained very good results with the 1.25 lb rate timed to early or beginning rust mite populations, and was less effective applied to established heavy mite infestations. Our trials also showed that rapidity of mite kill (knockdown) was improved when Micromite was tank mixed with a low volume (0.50-1.0%) petroleum spray oil (Narrow Range 435 oil). However, in some trials residual (long term) rust mite control was shortened when Micromite was tank mixed with certain copper fungicides used for citrus fungal disease control, e.g., Nu-Cop fungicide.

In our trials against the citrus leafminer, Micromite spray applications targeting (timed to) the egg and newly emerged larval stages gave the best control. However, Micromite does have activity against the later larval and pupal stages. During 1999, two Micromite formulations (25WS and 80WG) each tank mixed with 0.5% NR 435 oil were compared at the 1.25 lb rate for efficacy against leafminer. Both treatments provided excellent control with > 96% leafminer mortality recorded thru 21 days post-spray, comparable to the leafminer mortality obtained with a standard Agri-Mek (abamectin) + 0.5% NR 435 oil treatment.

In bioassays against beneficials, Micromite showed very low toxicity against important parasite and predator insect/ mite species commonly occurring in Texas citrus orchards. Also, it is non toxic to bees. Micromite's unique chemistry will be an asset in management of chemical resistance, particularly in citrus rust mite—due to heavy reliance on/and repeated use of certain miticides. Micromite 25WS provides growers with an efficacious and much needed alternative pesticide that appears to fit very well into the overall Texas Citrus Integrated Pest Management (IPM) Program. If growers include Micromite 25WS in this season's spray program, I strongly suggest that they tank mix it with petroleum spray oil — preferably NR 435 oil (1-5 gal/acre).

J. Victor French

NEW TEXAS GRAPEFRUIT LICENSE PLATE TO BENEFIT RESEARCH AT THE CITRUS CENTER

The new Texas vehicle special red grapefruit license plate is now available, and can be ordered from the Texas Department of Transportation. An order form and an illustration of the plate are enclosed. The cost of the plate is $30 a year, in addition to the regular fee, a personalized plate can also be ordered which costs $70 above the regular fee. Of the $30, $5 is towards the cost of the plate, and the remaining $25 goes into a graduate student scholarship fund managed by the University in Kingsville specifically for citriculture students. This will be beneficial to the citrus industry of Texas, and to the Citrus Center as more research is being conducted by graduate students under the supervision of the research professors.

John da Graca

RECENT INCIDENCES OF *PHYTOPHTHORA* LEAF SPOT, STEM BLIGHT, AND FOOT ROT

Phytophthora parasitica is a fungus that is commonly present in soil. This fungus produces microscopic, lemon shaped structures called sporangia in which several zoospores are formed. The zoospores that are released into a film of water, can be dispersed by wind and rain splashing. Such zoospores can colonize young tender leaves or stem, by entering the tissue through stomatal openings or wounds. Once the fungus gets inside a host tissue, it will grow profusely and produce several sporangia.

We have recently observed symptoms on the leaves and stems of mature grapefruit trees in two locations caused by *Phytophthora*. The symptoms were blights on leaves and small twigs that are closer to the ground. The blighted twigs also showed gumming. The symptoms were only found near the ground indicating that the infections occurred through rain splashing. Leaf or stem pieces from blighted areas were incubated in water culture in the laboratory and the presence of *Phytophthora* was confirmed. The disease incidence was noted as percentage of total trees showing either stem or leaf blight.

Apart from the leaf and stem blight symptoms, we have also noted high incidences of foot rot infection in two orchards—one in the Harlingen area and another one in the Mission area. Tree loss in these orchards was very high. Application of Aliette and Ridomil will reduce the impact of *Phytophthora* infections.

Disease incidence observed in grapefruit and orange orchards.

Cultivar	Location	No. Blocks Checked	Blocks with symptoms	Disease incidence%
Grapefruit	Weslaco	4	4	12
Orange	Mission	3	0	0

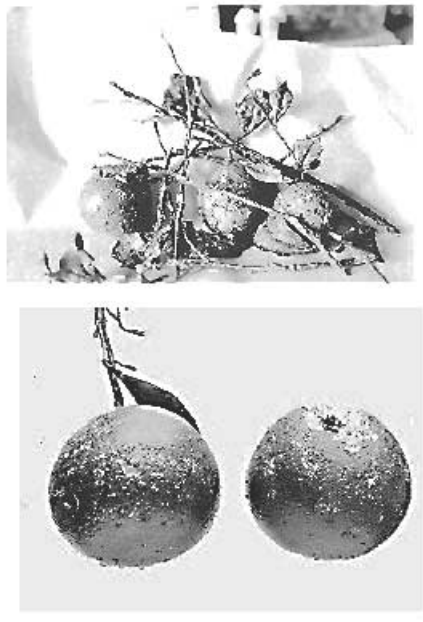
Symptoms of Phytophthora in leaves and small twigs.

HISTORICAL PHOTOS OF CITRUS CANKER FOUND IN COLLEGE STATION

Dr Tom Isakiet, formerly Texas A & M University extension plant pathologist in Weslaco and now stationed in College Station, recently found a box of old glass photographic negatives in the Department of Plant Pathology there. Amongst them were six showing symptoms of citrus canker on leaves, twigs and fruit of samples collected in Kingsville in 1915, and in Alvin from 1916 to 1919. The latter group were probably all taken by J.J.Tabenhaus, plant pathologist in College Station from 1916 to 1937; his name appears on a card attached to one of the negatives. Two are reproduced here.

Canker, a very serious bacterial disease of citrus, was eradicated from Texas in 1943. It has reappeared in Florida and has spread in that state. This is of concern to Texas, and hence there is an ongoing survey funded by the USDA to try and ensure that we remain canker-free (see August 1999 newsletter article by Mani Skaria "On the outlook for citrus canker").

John da Graca and Mani Skaria



Canker symptoms on sweet orange in Kingsville (1915) (Top) and Alvin (October 1916) (Bottom)

CITRUS FLOWERING

Citrus bloom in the last couple of years has been hard to understand. Last season, you'll recall that some orchards bloomed two, three or even four times. This season seems to be more nearly normal, yet some grapefruit orchards bloomed in late February, while others bloomed on schedule in mid-March. The amount of bloom on some trees was substantial, yet adjacent trees bloomed rather sparsely.

At the Citrus Research and Education Center in Lake Alfred, FL, Dr. Gene Albrigo has been doing some interesting work to relate late fall and early winter temperatures to citrus flower bud induction. According to Dr. Albrigo, a prolonged period of temperatures below 75°F with no tree growth is necessary for good flower bud induction. Periods of warm temperatures will stop induction and initiate floral differentiation, i.e., growth. He reports that the 1998-99 fall-winter period involved at least four cool periods which were each followed by week-long periods of warm weather—and that there occurred four separate blooms from January into May. During the current season, Dr. Albrigo predicted two citrus blooms in central Florida.

The other natural means of flower bud induction is drought stress that stops tree growth and allows induction to occur. Generally, 30 to 40 days without irrigation or rainfall should be adequate. Unlike temperature induction, drought stress precludes flower differentiation when warm periods occur during induction. You might recall that we commonly try to apply the last flood irrigation in November so as to induce a degree of dormancy that will better enable the trees to withstand cold weather. In the absence of winter rains, such practice also results in excellent flower induction, with flower bud differentiation occurring in the last half of January. According to Dr. Albrigo, some groves in Florida had only one bloom during 1999 because the growers maintained drought stress during the 1998-99 winter.

In warm and dry winters such as we just experienced, drought stress should result in good flower induction. However, some growers ran microsprayers during the winter, others flood irrigated in late December or early January, and some groves received good rains in early January. It is possible that such irrigation or rain stopped the induction process and initiated differentiation, such that inadequate induction occurred, resulting in reduced, but early, bloom. Will those trees bloom again? Maybe, but it is getting awfully late.

Julian W. Sauls, PhD.
Professor & Extension Horticulturist

JOINT RESEARCH EFFORT- A SUCCESS

Collaborative research efforts among three institutions- Texas A&M University- Kingsville Citrus Center (TAMUK-CC), Institute of Bioscience and Technology (IBT), and University of Texas -PanAmerican (UTPA) has come to realization. Recently, one of my graduate students, Mrs. Yan Liu, successfully completed her thesis defense entitled "Characterization of pectin and its relation to health benefits: Variation due to species and season". She is the first graduate student under the postharvest and nutraceutical program at the TAMUK Citrus Center. Her experiments were conducted in the laboratories of Dr. Bhimu Patil (TAMUK-CC-physiology), Dr. Hassan Ahmad (UTPA- biochemistry), and Dr. Wallace McKeehan (IBT-medical science).

Pectin is important to the food industry because of its capability of forming gels. High-methoxyl pectin (above 7%) will form jams and jellies with proper proportions of sugar and acid. Recently, scientists at Michigan State University have shown that modified citrus pectin may prevent cancer metastasis in rats. Citrus pectin is not only used as a jelling agent, but also prevents cancer metastasis, reduces cholesterol, reduces blood glucose level and exerts homeostasis function.

Citrus fruit are a rich source of pectin. A substantial portion of commercial pectin is derived from the citrus peel (flavedo and albedo). However, our results have shown that the lamella (white layer between segments) and juice vesicles have equivalent or more pectin compared to the flavedo and albedo. Furthermore, citrus pectin properties can be influenced by the species and season. Pectin extraction rate, anhydrogalacturonic acid and sugar content in tangerine were the highest among four representative species (lemon, grapefruit, orange and tangerine) studied. Lemon lamella contained the highest methoxyl content compared to the methoxyl content in the other three species.

Fibroblast Growth Factor (FGF) is a signal system and is mediator of developmental processes in the human embryo and homeostasis in the adult. Any defect in FGF system and incorrect cell signaling lead to diseases such as cardiovascular disease and cancer. Any plant derived or synthetic compound that inhibits the FGF signal transduction would be a potential candidate for preventing several chronic diseases. Our research results, in collaboration with IBT, have shown that the all four citrus species were able to inhibit FGF. Furthermore, the highest FGF inhibition occurred by pectin from the lemon lamella followed by tangerine. Based on these results, citrus pectin appears to have potential benefit for preventing certain diseases. Research results on harvest season effect on FGF inhibition and variation in characteristics will be discussed in the next newsletter.

Bhimu Patil

GUIDE FOR TEXAS CITRUS GROWERS ON HEDGING AND TOPPING BEING PREPARED

To follow up and summarize my talk on hedging and topping given at the Texas Citrus Mutual Spring Meeting in March, I am writing a short handout on the principles and suggested practices for hedging and topping Valley Citrus orchards. Based on many years of research on tree growth and fruiting characteristics, actual hedging and topping research, South Texas climatic features and observations from experienced orchard owners, the publication will be written as a "how to" guide.

The handout will cover the major factors to consider in the initation and management of a hedging and topping program for both orange and grapefruit orchards. Besides specific suggestions on when and how to hedge or top trees, the reasons underlying the suggestions will be elaborated. The publication should be available some time in May.

John Fucik
Horticulture (Retired)

VISITORS AT THE CITRUS CENTER

Company Representatives that visited Dr. French in March were: Dr. Drew Palrang, Field Development Representative for Bayer Corp., Austin, TX; Joe Mitchell and Gaylon Pfeiffer, Technical and Business Representatives, respectively for BASF Corp., Tampa, FL conducted grower and distributor meetings on NEXTER® miticide; and Dr. Alan Dalrymple and Tadd Westermann, Technical Representatives for Uniroyal Chemical, Lindale, TX, conducted grower and distributor meetings on newly labeled MICROMITE® miticide/insecticide.

Dr. Don Grosman, Entomologist with the Texas Forest Service, Lufin, TX; and Hongyu (Toma) Duan, Entomologist for Griffin LLC, Valdosta, GA visited Dr. French to help setup trials with Volcano Leafcutter Ant Bait.

Jason Mottern, TAMU Entomology Graduate Student from College Station, TX visited the Citrus Center and collected Tropical fire ants for his research.

In March, three visitors from Europe, Lionel Mesnildrey and Antonio Oliva from the European Commission office in Dublin, Ireland, and Giancarlo Pouzzi from Italy visited the Center as part of a tour to familarize themselves with citriculture in Texas.

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