Texas A&M University-Kingsville

Citrus Center

Weslaco, Texas

Vol.28 No.1 NEWSLETTER February 2010

Citrus Center Hosts Subtropical Plant Science Society Meeting

Eliezer Louzada and John da Graca

On January 25, the Citrus Center hosted the 64th annual meeting of the Subtropical Plant Science Society (formerly the Rio Grande Valley Horticulture Society). It was a noteworthy meeting for several reasons. Society President, Dr Eliezer Louzada welcomed nearly 100 attendees, the largest turnout for several years, including scientists and students from the various research centers in Weslaco, the university campuses in Kingsville and College Station and the University of Texas-Pan American and the Centro de Biotecnología Genómica in Reynosa. Many growers also attended, as did teachers and students from Weslaco High School who participated in Dr Louzada's biotechnology summer camps.

On the program were six speakers – Dennis Holbrook (South Texas Organics) spoke on his experiences as and organic farmer, Andy Scott (Rio Farms) delivered a talk on potential new crops, Forrest Smith (TAMUK) talked about native seed and plants, Juan Anciso (AgriLife Extension) spoke about small farms and good agricultural practices and Dr Mani Skaria (Citrus Center) made a presentation on living with citrus greening disease.

The Keynote Speaker was Dr Steven Tallant, President of Texas A&M University-Kingsville, who spoke about the university's vision for education in the Rio Grande Valley. He then presented scholarships from Dr Louzada's USDA-Hispanic Serving Institution grant to two of the high school students from the summer camp program, David Ortiz (in the top 1% in the grade) and Emanuel Jimenez (top 10%), to enable them to attend the university in Kingsville.

The Arthur T. Potts Award for 2010 was then presented to one of the Valley's best known growers, Mr Jimmie Steidinger. He was formerly nominated by the former Weslaco Center Director, Dr Jose Amador, who summarized the contributions Mr Steidinger had made to the Citrus Center, TAMUK (including the establishment of the Barbara & Jimmie Steidinger Citrus Graduate Student Scholarship fund), and agriculture in the Valley in general. The plaque was presented to him by Dr Tallant and Dr Louzada.

The annual student poster competition awards were also announced, with first prize going to Jose Sandoval III of the Citrus Center, second prize to Justin Tanner also of the Citrus Center, and third prize was award to Xiangbing Yang from the AgriLife Center.

At the business meeting, Dr Shad Nelson (Agronomy & Resource Sciences Dept. Chair, TAMUK) was elected President of the society.

New Building Takes Shape

John da Graca

Construction on the new Citrus Center building began last September, and above ground work started in December. Since then, visual progress has been apparent, and it is now really looking like a building. The first floor was poured a few weeks back, and now roofing is almost complete, and plumbing, electrical and mechanical rough-in is on-going. Exterior walls are also being installed. The construction company, Skanska, reports that they are 2 weeks ahead of schedule, despite rain interrupting work on occasion.

The entire project is due for completion by early November, with an anticipated move-in date sometime in August.

Texas Citrus Greening Website

John da Graça and Mamoudou Sétamou

Texas Citrus Mutual has taken the lead in setting up a new website specifically for citrus greening disease. Please visit it: www.texascitrusgreening.org

It is designed to inform growers and homeowners about the disease and its vector, the Asian citrus psyllid. In particular, it will help concerned citizens know what to do if they see suspicious symptoms on their trees. Images on greening and other factors which cause abnormal symptoms are there for comparison, as are instructions on how to collect samples for lab testing and where to send them.

See Greening Website Page 5

King Jose

John da Graca

At the 73rd annual Citrus Fiesta in Mission in January, Dr Jose Amador, retired Center Director, was elected as King Citrus for 2010. The King is elected by former Kings, and is crowned during an evening extravanza.

The Citrus Center congratulations HRH Jose on this well deserved recognition, and we wish him a fruitful reign.

Winter Yellows and Leaf Drop in Texas Citrus

Mamoudou Sétamou

Many growers and homeowners may have noticed some leaf yellowing and possibly leaf drop on citrus trees during the past few weeks. This dull yellow appearance of citrus leaves that is more prevalent on grapefruit than sweet orange is due to the extended cold winter that has prevailed this year in south Texas (See Fig 1). Citrus leaves can remain on the tree for as long as three years depending on tree vigor, but leaf longevity can be affected by many factors including diseases, inadequate or excessive nitrogen supply, excessive salt or boron in the soil, poor irrigation practices, very cold or freezing temperatures, phytophagous mite pressures and low light intensity. Thus, leaf drop during winter normally reflects nothing more than a momentary change in the balance between the natural elimination of old senescing leaves and their replacement.

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Sour Rot of Mature Fruit Exposed to Freezing Temperature

Mani Skaria

The fungus, *Geotrichum candidum* (aka *Galactomyces citri)* is common in soils of the Rio Grande Valley. It causes fruit decay of citrus, especially of grapefruit in the Valley and particularly in certain situations. We had such a situation recently, and sure enough, sour rot showed up in some of our shipments, both grapefruit and oranges.

Susceptibility to sour rot increases as the *Geotrichum* becomes mature and the fruit become defenseless when it is wet. But these two conditions are not just sufficient for the fungus to enter the fruit. *Geotrichum* needs an external help – it needs a wound on the fruit surface to gain access into the ring tissue. Once it is inside, the fungus begins to macerate the tissue and fills the affected area with plenty of spores.

Once sour rot infection starts, it would spread rapidly in the packinghouse via pallets, packing line brushes and belts. Fruit flies that are visiting rotten fruit will be carriers of *Geotrichum* spores on their body parts.

Fruit harvesters and shippers should look for the initial symptom – water-soaked, yellowish, raised tissue. You will see the beginning of the sour rot symptom similar to the beginning symptoms of the common green mold fruit rot (Fig). However, one difference is that green mold symptoms soon show massive fungal growth on the exterior with colorful spores. With sour rot, there is no colorful fungal growth. Instead, you may see some creamy mycelium, watery mass from affected area, and a rancid smell.

Control:

Sour rot fruit must be effectively removed from the packinghouse

Careful harvesting to minimize fruit injury

Avoid harvest of turgid fruit

Avoid harvesting over-mature fruit for packing

Maintain a thorough eye-grading to remove all sour rot fruit

Good sanitation practices of packinghouse brushes, conveyer belts, and tanks

Store packed fruit, if necessary at cooler temperature around 50F

Chemical treatment with SOPP

Though rare, this fungus is also known to cause infections of skin, mouth and lungs. Interestingly, one species of this fungus is used in the maturation of cheese.

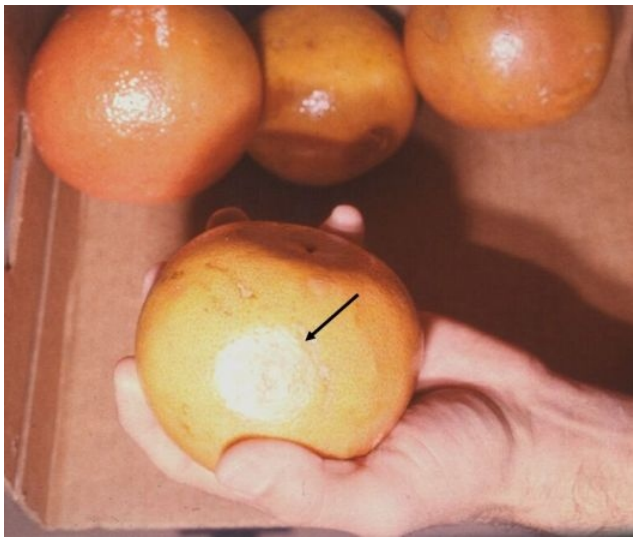

Fig. Sour rot water-soaked tissue of a Rio Red grapefruit.

Citrus Rust Mite, the Mighty Cold Hardy Mite

Mamoudou Sétamou

Traditionally, citrus rust mite is present all year round in our citrus groves. However, its lowest populations are observed between November and early February in South Texas. After the January freeze of this year one would have expected to see the citrus rust mites decimated from citrus groves, unfortunately this pesky mite survived the cold weather and its populations started to multiply in February. Soon after the freeze, we have collected some citrus rust mite-infested fruit to evaluate the effect of the cold weather on its population. Though most of the mites turned brownish after the freeze showing the traditional 'brownish' appearance of dead mites, most of these mites soon recovered their normal pale yellow color just few hours after being brought inside the laboratory. This observation suggested that the citrus rust mite survived the freeze. To ascertain that the citrus rust mite exhibited some tolerance to cold weather, infested fruit were collected from a grove and maintained in a deep freezer at 20 F for pre-defined periods varying from 1 to 5 hours. After the exposure period, fruit were removed from the deep freezer and brought to the laboratory for observation. Surviving mites were observed even after keeping

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Citrus Rust Mite from Page 3

infested fruit in deep freezer for up to 3 hours. Knowing that no citrus fruit could withstand such extreme temperatures, it appears clearly that the citrus rust mite has some cold hardiness and one should not assume that the cold weather alone will suffice to provide effective control of this mite. It is however important to note that just after the freeze, very few mobile mites were observed on fruit or leaves of citrus trees as they development has been seriously hampered. Similarly, no eggs or immature mites were found during that period. But with the warmer days that followed the cold weather coupled with the high humidity brought about by the winter rains, it is likely that the citrus rust mite population will dramatically increase this spring. To prevent early season rust mite damage and subsequent outbreaks of this mite population it is important that spray applications be made before bloom whenever possible.

For conventional growers, several miticides are available and can be used. Among others, miticides such as abamectin (e.g. Agrimek, Abba, Zoro, Epimectin), fenbudatin-oxide (e.g.Vendex), formetanate hydrochloride (e.g.Carzol), aldicarb (Temik), diflubenzuron (e.g. Micromite), oxamyl (e.g.Vydate), (spirodiclofen (e.g. Envidor), spirotetramat (e.g. Movento) can effectively be used to control rust mite. Some insecticides such as fenpropathrin (e.g. Danitol and Tame) and chlorpyrifos (e.g. Chlorpyrifos 4E, Lorsban, Yuma) can also provide some knock down and effective control specially when citrus rust mite populations are low. In any case, it is important to follow label recommendations and observed the various restrictions while using any chemical pesticide. It is also important to ensure that the miticide that is selected has a valid registration with the Texas Department of Agriculture before being used. The registration status of any chemical pesticides can be checked online at: http://state.ceris.purdue.edu. Once on this page, click on the state of Texas tab and continue with your search.

Oil, the best lotion for citrus groves

For all types of production systems including organic groves, spray oil remains one of the best tools for rust mite control. Oil can be used as stand alone or mixed with other pesticides for effective rust mite control. There is no known pest resistance to oil, as it kills by suffocating the pest. With the hot weather prevailing during most of the active growing season in South Texas, it is important not to go too heavy on oil during summer to minimize the risks of phytotoxicity. Generally, application rates of 1 to 2% (volume/volume) are recommended. In addition to mite control, oil provides excellent control for many other pests.

Winter Yellowing from Page 2

Fig. 1: A grapefruit tree showing symptoms of winter yellow(Inset: close up view of dull yellow

Citrus foliage is evergreen vegetation

Citrus trees normally keep their green foliage year round. But unlike deciduous plants, citrus trees shed older leaves throughout the year groves. New leaves are also frequently produced throughout the year when shoots elongate. Periods of shoot elongation are called flushing or flush cycle. Typically, citrus trees including grapefruit, sweet oranges and mandarins have four flush cycles during the growing season from February to October in south Texas. Lemons and limes are more vigorous and tend to produce new leaves almost continuously through the growing season. Unlike the traditional evergreen vegetation we are used to seeing, some trees are showing some yellow leaves this winter. This observed leaf yellowing is probably attributable to excessive water in the root zone that is combined to cool soils. Foliage analysis showed that the yellow leaves suffered from severe iron, zinc, manganese, and nitrogen deficiency. The freezing temperatures and the prolonged cold weather that has prevailed this winter may have rendered the soil too cool for any root activity, thus explaining the poor uptake of these nutrients.

We expect these trees showing the winter yellow leaf symptom and even some defoliation to fully recover this spring. But as a precautionary approach, growers should start planning for nitrogen fertilization and micronutrient applications to help those trees. But if some of the affected trees do not produce a vigorous flush in early spring, they may have a more serious problem that needs to be investigated and addressed.

Greening Website from Page 2

The fight against greening will only be successful if everyone who has citrus is involved. This new website is the latest tool. We continue to test leaf and psyllid samples collected by Citrus Center and USDA-APHIS personnel, and later this year the sample collection will be expanded into commercial orchards. In addition, the Texas A & M plant pathology diagnostic lab in College Station will become actively involved in the survey, concentrating on citrus north of the eight county "citrus zone" in south Texas. The non-detection of greening so far could be that the disease is not here yet, or is at a very low incidence and has not become apparent. Whichever, Texas has a window of opportunity to be proactive in dealing with this destructive disease. One such proactive method is an aggressive psyllid control program in orchards and nurseries. We urge growers to keep psyllid populations as low as possible by implementing various control programs. A link can be found on this new website describing various control options for different production systems.

Visitors from Turkey

Mani Skaria and John da Graca

A father and two daughters from the Ozler family from Adana, Turkey visited the Citrus Center, February 15-17, 2009. It was the second visit of Mr. Bülent Özler, who first visited the Citrus Center in 1987 when Dr. Richard Hensz was the director. He introduced Rio Red grapefruit to Turkey and it is now the backbone of the Turkish grapefruit industry. This was the first visit for the two daughters, Duygu and Basak.

They own and operate one of the largest fruit tree programs in Turkey and especially in citrus. More information can be seen at http://online.ozler-tarim.com.tr/eng/

The 2007 meeting of the International Organization of Citrus Virologists (IOCV) was held in Adana, Turkey where the Ozler family was one of the citrus industries that sponsored the meeting where Dr. John da Graca was the IOCV chair. The recent visit of the Ozler family members was prompted by their interest in micro-budded citrus and the new citrus variety development at the Citrus Center. They met with Dr. Eliezer Louzada to learn about the new red grapefruit and other cultivars. They visited the micro-budding operations in Edinburg, Texas, and the Edinburg Citrus Association packinghouse.

Fig. 1. Mr. Jesus Valencia of the Edinburg Citrus Association explaining the citrus packinghouse operations to the visitors.

They got an unexpected opportunity to attend the HLB meeting at the Citrus Centerwhere they get tolearn a lot about the HLB situation in Florida and the importance of field inspections for HLB symptoms and psyllids. The Citrus Center faculty presented them with a copy of the Citrus book published by the Texas Citrus Mutual commerating its 60th anniversary.

According to the citrus researchers at the Cukurova University Faculty of Agriculture, Turkey has 120,000 ha or 300,000 acres of citrus, ten times the size of the Texas citrus industry. The Turkish citrus industry occupies about 2% of the country's horticultural area. Approximately 75% of the Turkish citrus is in the Mediterranean area, 23% in the Aegean Sea area and the rest in the Black Sea area. The predominant rootstock is sour orange (95%) and the preferred citrus are in order: sweet orange, mandarin, lemon, and grapefruit.

Fig. 2. Map of Turkey with reference to the three sea areas of citrus production.

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