

# Citrus Center



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NEWSLETTER

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## **Curbing The Threat Of Citrus Greening: Development Of An Areawide Management Program For Asian Citrus Psyllid In Texas**

*Mamoudou Sétamou and John da Graça*

The invasive Asian citrus psyllid, one of the vectors of citrus greening disease pathogen, was reported for the first time in Texas since 2001. The detection of citrus greening disease in Florida in 2005 has dramatically increased the pest status of this insect vector, as any accidental introduction of the disease into Texas will suffice to create the ideal conditions for the disease establishment and spread. Given the concentration of the Texas commercial orchards in the Lower Rio Grande Valley (LRGV), citrus greening disease will be a potential industry killer, should it be accidentally introduced here. The Center for North American Studies, Texas AgriLife Research has estimated that citrus greening disease could lead to nearly 50 percent reduction in economic activities and job losses out of the \$160 million in economic activity and 2000 jobs currently supported by the Texas citrus industry.

The uniqueness of the current Texas situation with the presence of the insect vector and not the citrus greening disease opens avenues for the implementation of an aggressive area-wide vector control program in commercial citrus orchards, nurseries and dooryard trees. In fact, in areas where both the psyllid vector and the greening disease occur simultaneously, there is a general agreement that control of the psyllid vector reduces the spread and risk of the disease.

The Texas A&M University Citrus Center, in collaboration with the Texas Citrus Mutual,

USDA-APHIS, USDA-ARS and citrus growers is implementing a pilot project to demonstrate the viability of an area-wide management program for psyllid in Texas as a way to substantially lower psyllid populations in the LRGV. To be viable and meet growers' agreement this psyllid control program must be incorporated into the ongoing pest management program that targets other important pests such as the citrus rust mite and citrus leafminers.

In mature orchards, this program starts with a dormant application of broad spectrum insecticides to target over-wintering adult psyllids before the first flush is produced on trees in spring and psyllid populations begin to increase. Subsequent applications are made with systemic insecticides and timed before the second and third flush, respectively. All these chemicals are tanked mixed with miticides to target citrus rust mite and other mites affecting citrus. The large distribution of groves in the valley also requires that chemical treatments be done in a coordinated fashion to ensure that psyllids are simultaneously targeted over a large area. Such speed of spray programs can only be achieved using aerial spray. In our tests at selected sites, the efficacy of aerial applications (Figure 1) of pesticides is being compared with that of airblast ground rig sprayers. Preliminary results following the dormant spray suggest that both ground and aerial applications are effective and comparable methods for reducing psyllid populations.

The efficacy of several biopesticides such as neem oil, citrus oil, kaolin, garlic oil is also being investigated in organic orchards.

Nurseries which are critical to an industry for providing planting materials should also be under intense psyllid control program. These nursery plants

# Water Conservation Researchers Receive Texas Environmental Excellence Award

*Heriberto Esquivel and Shad D. Nelson*, Department of Agronomy & Resource Sciences, Kingsville

Rio Grande Basin Initiative (RGBI) researcher Dr. Shad Nelson, soil scientist with Texas A&M University-Kingsville, is collaborating with researchers, such as Dr. Juan Enciso at Texas AgriLife Research and Extension in Weslaco, Texas to evaluate irrigation use efficiency in the Lower Rio Grande Valley (LRGV). On-farm water conservation demonstration sites funded by the USDA/CSREES RGBI focus on various alternative and traditional irrigation practices such as drip, microjet-spray, and narrow-border flood systems. Investigations into the amount of water savings on citrus at the TAMUK Citrus Center South Farm have corroborated findings at on-farm demonstration sites at grower's fields throughout the LRGV.

For the 2006-2007 growing season, compared to traditional flood, narrow-border flood had a 22% water savings, microjet spray at 29% and drip irrigation at 49% water savings.

As part of the RGBI program Dr. Nelson's work has helped Texas AgriLife Research and Extension attain the award from the Texas Commission of Environmental Quality (TCEQ) award called the Texas Environmental Excellence award to be presented to researchers and project directors of the Rio Grande Basin Initiative in Austin, TX, April 30. Dr. Juan Enciso, Agricultural Engineer, Texas AgriLife Research and Extension Center at Weslaco, collaborates with Dr. Nelson in conjunction with RGBI projects in the LRGV.

| Irrigation Type   | Water Savings       |                     |  |
|-------------------|---------------------|---------------------|--|
|                   | Gallons/<br>Acre/Yr | Acre-Ft/<br>Acre/Yr | If All 27,000 Acres of Citrus<br>used this irrigation type<br>(Ac-Ft/Yr) |
| Drip              | 584,100             | 1.79                | 48,399   |
| Microjet Spray    | 347,249             | 1.07                | 28,773   |
| Narrow -Border    | 260,671             | 0.80                | 21,599   |
| Traditional Flood | 0                   | 0                   | 0  |



Top: Dr Shad Nelson, Associate Professor at TAMUK, interviewing for RGBI Video along with Eddie Esquivel, ADI Project Manager for TAMUK, at various water conservation demonstration sites at TAMUK Citrus Center South Farm and Texas AgriLife Extension, Weslaco, TX.

Bottom Right: Dr. Bill Harris, Associate Director, TWRI; Project Director RGBI looks on as Dr. Nelson is interviewed.

## Graduate Students Defend Theses

*Mamoudou Sétamou, Eliezer Louzada & John da Graça*



The Citrus Center's graduate student program continues to grow, and the research programs of the students are making significant contributions to the research of the center which could ultimately benefit the citrus industry of Texas. Three of our students recently defended their masters theses, and they will graduate in Kingsville in May. They are all products of Dr Louzada's undergraduate internship program.

**Jesus Mata Jr.**, who began his association with the Citrus Center in 2003 as a part-time assistant in Dr Louzada's lab. After obtaining BS degree from the University of Texas-Pan American in 2006, he began his masters program at the Citrus Center. Jesus worked under the guidance of Drs Louzada, Sétamou, French and da Graça on a project to develop a technique to molecularly distinguish between the different species of false spider mites (FSM). This is extremely important considering that FSMs are prevalent in Valley citrus, and are vectors of Citrus leprosis virus. Traditional identification of mite species involves examining mounted specimens under the microscope to look for small anatomical differences – this can be difficult and has resulted misidentifications in the past. Jesus was able to develop a method which clearly distinguishes between two species, using the DNA from just one mite of each species.

**Adrian Sanchez**, a native of Matamoros and a graduate of the University of Texas at Brownsville, worked in Dr Sétamou's laboratory. His project was designed to determine what influences the behavior of the Asian citrus psyllid in finding its host plants. He determined that light is a necessary factor for alighting the flight of this insect and for its egg laying. He evaluated the attractiveness of different trap colors and showed that both yellow and red traps are efficient for

monitoring psyllid populations in the field. Based on host plant volatile analysis, he determined that psyllid might use a blend of selected volatile organic compounds present in their host plants in addition to color for colonization.

**John Tagle**, a graduate of the University of Texas Pan-American and native of the Rio Grande Valley, worked in Dr Louzada's laboratory. His project was to study the involvement of the mechanism of alternative splicing in a cold tolerance gene from trifoliate orange. Alternative splice is a process by which a single gene produces different m-RNA and many times different proteins. This is a very important process that has never been described as being involved in cold hardness in citrus. John found that a part of the trifoliate orange genome that should be spliced out, is indeed retained during cold acclimation. His results add a new light into the cold acclimation of the cold hardy trifoliate orange.

### Adrian Duran - In Memoriam

The Citrus Center recently lost one its own - Adrian Duran. Adrian worked at the Center as an auto mechanic from 1975 until his retirement in 2004. For several years, he resided in the mobile home which at the time was on the West Farm, and played an essential role in maintaining the research orchards there, as well as providing security by being there. Adrian got on with his duties in a quiet an unassuming way, but we were always aware of how important a member of the team he was, and that we really appreciated his contributions.

We all offer our sincere condolences to his wife Sabine and the rest of his family.

### Citrus Center Folk Receive Awards

Several faculty and staff of the Citrus Center recently received recognition for their service. At the annual College of Agriculture, Natural Resources & Human Sciences held in Kingsville, **Dr Vic French** received special recognition on the occasion of his retirement, **Dr Eliezer Louzada** received the Senior Researcher Award, **Terry Gonzales** received the Staff Award, and **Adrian Sanchez** received the Graduate Student Award.

One week later, the University held its annual service awards luncheon, and the following from the Center received awards: **Dr Vic French** (35 years), **Dr Mani Skaria** (20 years), **Rene Pena** (20 years) and **Sonia del Rio** (10 years). **Dr French** and **Teddy Medrano** were also honored on the occasion of their retirements.

Congratulations to everyone.

# Retirement Party for J. Victor French and Teodoro Medrano

J. Victor French



Teodoro Medrano



Victor receives gifts



Teddy receives gifts



John Fucik roasts Victor



French Family



Medrano Family with Bert Davis



Another generation of Medranos -  
Teddy's grandchildren



Everyone enjoying a good lunch



Allen Rasmussen, Dean of Agriculture,  
Natural Resources and Human Sciences at  
TAMUK addresses the gathering

## Threat of Greening from Page 1

are particularly challenged by psyllid since this insect exclusively reproduces on new flush growth. Soil systemic insecticides coupled with foliar sprays are



Figure 1 Fixed-wing aircraft spraying a citrus orchard

the best approach for reducing psyllid population in nursery settings as well as young plantings.

As citrus and its ornamental relatives are companion plants in dooryards, successful control of psyllid in an area-wide program should also target this insect pest in dooryard trees that remain most of the time unchecked. An educational program is essential in providing the necessary information to the general public regarding psyllid control and greening man-

agement. One component of the ongoing area-wide management program is to screen for the best products including chemical insecticides and bio-pesticides that can be safely applied in dooryard situation.

Overall, this proactive approach of managing citrus psyllid before any eventual accidental introduction of the disease into Texas appears to be our best option for ensuring that our citrus industry remains viable for many years to come. Doing nothing is not an option, and for our ecosystem to remain the ever-green vegetation covered with citrus trees, we need to control citrus psyllid and prevent citrus greening disease.

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