Texas A&M University-Kingsville

Citrus Center

Weslaco, Texas

Vol.27 No.1 NEWSLETTER February 2009

Citrus Center Celebrates 60 Years of Service

On December 17, the Citrus Center hosted a luncheon to celebrate its 60th anniversary. Over 200 guests representing elected officials, University leaders and staff, citrus growers and nurserymen and fellow research and administration colleagues from other centers in the Lower Rio Grande Valley enjoyed a lunch (left photo) which included, of course, grapefruit pie for dessert.

After welcome remarks from the Director, Dr John da Graca, the group was addressed by Dr Allen Rasmussen, Dean of the Dick & Mary Lewis Kleberg College of Agriculture, Natural Resources & Human Sciences, and the new President of Texas A & M University-Kingsville, Dr Steven Tallant (center photo). Both recognized the achievements of the Center over the past 60 years, and assured the industry of continued research for its benefit in the future. Mr Salomon Torres, District Director for Congressman Ruben Hinojosa, State Representative Armando Martinez and Weslaco City District 6 Commissioner Patrick Kennedy then addressed the gathering in turn. Mr Torres presented a letter from Congressman Hinojosa to Dr da Graca congratulating the center on its anniversary.

The President of Texas Citrus Mutual (TCM), Mr Ray Prewett then spoke of the major contributions that the center had made which had benefitted the citrus industry over the years. The Chairman of TCM, Ms Becky Bonham, presented the Center with a poster representing the Red Grapefruit Family Tree developments in Texas (right photo).

The Texas Commissioner of Agriculture, Todd Staples, who was in the Valley for a TDA function, also stopped by briefly. Amongst the attendees were a number of Citrus Center retirees, including Dr John Fucik, Dr Victor French and Dr Jose Amador. The former Director, Dr Richard Hensz and his wife Betty, had made plans to travel from their home in Kerrville to Weslaco to attend the celebration, but unfortunately had to cancel at the last minute – he nevertheless sent his best wishes to all present.

Melanose Disease Control in the Valley

Mani Skaria

The incidence and severity of a citrus disease called melanose in the Valley has been increasing. We know a lot about the disease melanose and the ways to control it. In fact, all the tools and information needed for melanose disease control is in the literature. Let us revisit it and find out how we may control melanose disease in the Rio Grande Valley. Below is a table outlining what, where, when, and how we may reduce the impact of this disease.

Item	Topic	Discussion
1	What is melanose?	Melanose (Greek = melan = black) in citrus is a disease caused by fungus *Diaporthe citri.* The major concern of melanose in the Valley is infected fruit, showing melanose pustules, surrounded by a yellow ring. It is a superficial infection that does not affect internal fruit quality; however it reduces fresh fruit quality. This fungus is also associated with a form of postharvest disease called stem end rot. The spores are produced in special fruiting bodies called pycnidia.
2	The Fungus	The Latin name of the fungus is *Diaporthe citri.* It grows well on dead twigs, especially that are dead recently. It produces two types of spores. The spores from abandoned grows in your area can be melanose liability for you. The fungus does very well under the following conditions: Temperature 60 F Leaf or fruit wetness for a day At higher temperature of 77 F, it needs only ½ a day wetness. The fungus is a problem in older orchards compared to younger ones.
3	How long it takes to show the symptoms?	About a week
4	The symptoms	**Leaf:** Brown spots eventually raised, gives a sand paper effect when touched (Fig 1) **Fruit**: Brown spots and tear stain if dew and rain occur (Fig 1) **Twigs**: Dead, brown bark, a well-defined margin between the dead and healthy bark, gumming visible if not wash off by rain water
5	So, what can you do?	1. Avoid too much dead wood. Citrus growers have to do topping and hedging to control tree size. Why don't we practice some buck-horning to reduce the tree size, just like what we did after the 1989 freeze 2. Sprays (see item 7 below)
6	More on item 5 - Cultural control	1. Periodic pruning is effective, but I suggest the Valley try item 5:1 given above. Try and see the result yourself. 2. If you have any questions, visit orchards that have been buck horned recently and sprayed 3. Either pruning or buck-horning will help: a. Reduce fungal inoculum level b. Increasing air circulation and bring dead wood control c. Increase fungicide penetration
7	Sprays	Copper and other fungicides that are used for greasyspot control have effect on melanose too. Studies done by Dr. Timmer in Florida show that under heavy melanose pressure, four applications of copper had more control of melanose, compared to 1, 2 or 3 applications
8	Some mistakes people make	Some people claim that they had sprayed fungicide but no effect. Further discussions reveal that the spray was actually done in the summer-it is too late. You cannot reverse melanose symptoms with spray Melanose sprays are preventive **NOT** curative
9	Do we need more research on melanose in the Valley?	We have a lot of good information from credible sources. The nature of the disease and the control measures are such that there is no new information needed. Follow the suggested recommendations. The Valley citrus growers may be better off by looking at greasyspot control specific to the Valley.

See Melanose page 3

Melanose from Page 2

Figure 1 Melanose symptoms on grapefruit leaves and fruit. Raised, dark pustules give a sandpaper effect when rubbed.

Congratulations to Vamsi P.Reddy

Mani Skaria, John da Graca, and Shad Nelson

Best wishes and congratulations to Vamsi Reddy on the occasion of the successful completion of his MS degree in Plant and Soil Science at Texas A&M University-Kingsville, December, 2008. Vamsi joined TAMUK in Spring 2007 and conducted his research at the Citrus Center. . His research project was done under the direction of Drs. Shad Nelson and Mani Skaria. His thesis is entitled "Gene expression studies in sour orange and C-22 rootstocks challenged with the citrus nematode, Tylenchulus semipenetrans and the fungus, Phytophthora nicotianae."

Vamsi was born and raised in Andhra Pradesh, India. He has had a meritorious record of participation in various service organizations at university and state levels in India, receiving numerous recognitions from student organizations and social service agencies. He has had rural agricultural training as a student and had work experience as a district coordinator for NETAFIM Irrigation India Pvt. Ltd in Hyderabad. Vamsi plans to do a practical training program with the psyllid/HLB survey efforts at the Citrus Center. We wish him success in his career.

Jose Angel Medrano Retires

Elias Hernandez & John da Graca

After 35 years of loyal service, Jose Angel Medrano, one of the Citrus Center's Farm Worker II's, has just retired. Jose, better known to his family and colleagues as "Shanqle", started his employment with the Texas A&I University Citrus Center in 1974 and has been an important member of the Center's farm maintenance crew throughout his tenure. He assisted the faculty with their many field trials, and played an important role in the orchard recovery efforts after the devastating freezes of 1983 and 1989. We thank him for all his contributions and his friendly work attitude. The Citrus Center faculty, staff, friends and family wish "Shanqle" a well deserved and happy retirement.

Proactive Spray Programs Proved to be Better Control Approaches for the Citrus Rust Mite in Texas

Mamoudou Sétamou and Danielle Sekula

Most of the citrus produced in Texas is destined for the fresh fruit market. Thus, our production goal is not only to preserve crop yield, but also to preserve the aesthetic values of fruit. Our subtropical climate that allows us to produce arguably the best grapefruit in the world also favors the development of a multitude of pests that affect our citrus crop. It is not therefore surprising that costs of pest control in Texas citrus represent approximately 50% or more of all grove care costs within a season. Among the 50 pest species affecting citrus in Texas, the citrus rust mite (CRM), *Phyllocoptruta oleivora*, has been for the past 50 years the most economically important one. The feeding damage caused by this pest results in fruit blemish on the rind, making it unmarketable as good fresh fruit. In light of the absence of any effective biological control agent and alternative control methods, the use of chemical pesticides has remained the major tool used by growers for managing CRM populations in Texas. Up to now, miticides have been used based on a certain infestation threshold on citrus fruit during the active growing season.

Recent studies of CRM populations have however revealed that CRM inhabits the citrus tree in general. It is found on leaves, twigs and fruit, but continues to feed on the foliage even in the absence of citrus fruit (***see unsprayed control on Figure 1A***). Traditionally, control programs are initiated when CRM are found on the fruit from spring onward. However, by the time CRM appears on the fruit, its populations are generally very high in other parts (leaves and twigs) of the tree. Given that the best result the spray of any good miticide will provide is 90-95% of population reduction, it is not surprising that mite populations rebuild within 2 to 3 months after spray when detected on fruit. The goal of our newly developed program was to target CRM when it is more fragile and not reproducing in winter and before new fruit is produced in spring.

This approach has been termed ***proactive control***. In this proactive control we compared three (3) winter spray application dates (January, February, and March) to the traditional grower initiation date of spring (April). The spray initiation date is the time when the first spray application of abamectin (Agrimek) for CRM control was put in. This initiation date is the only factor that was different between the treatments. The other CRM control strategies (Temik application in late February, Envidor and Agrimek spray applications respectively in late June and early September) were identical. These four spray initiation treatments (January, February, March and April) were compared to an untreated control in which no mite control was implemented. Results of our tests revealed that early applications of miticides from January to March (only the January one was presented) were highly effective at dramatically reducing CRM populations on leaves (Figure 1A) and fruit (Figure 1B), thus preventing their rapid build-up in summer.

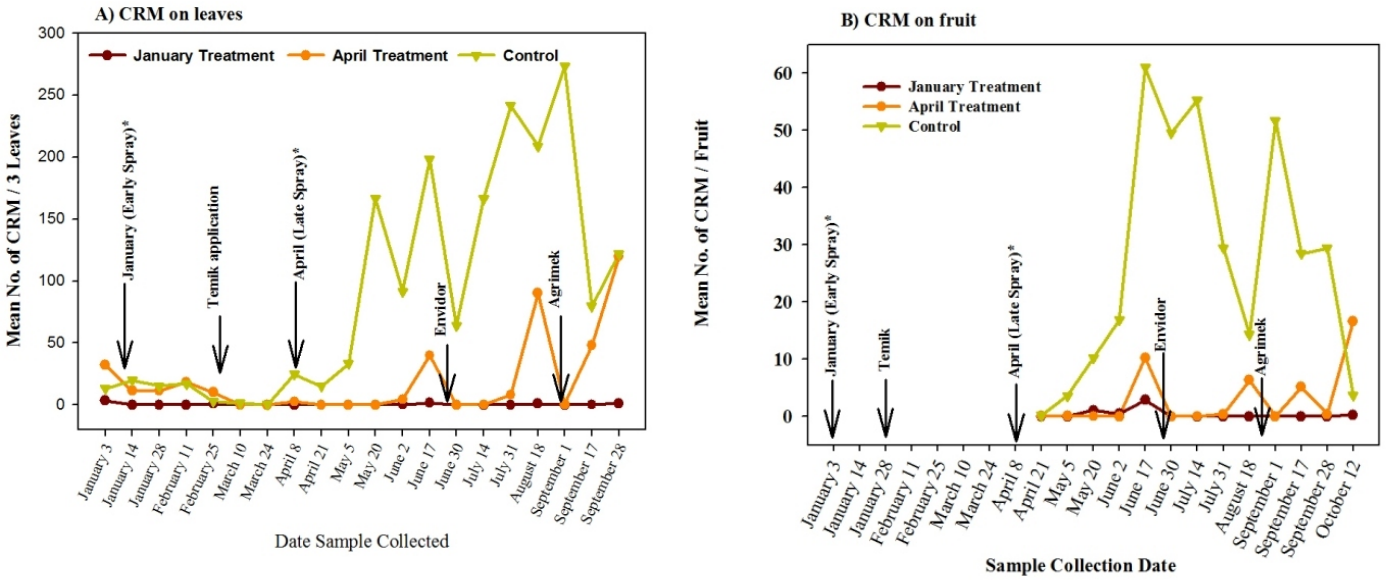

Figure 1: Fluctuations of citrus rust mite populations in unsprayed blocks and sprayed blocks where spray treatments are initiated at different times

Proactive See Page 5

Proactive from Page 4

In contrast in the spring spray initiation of April, temporarily CRM population suppression was observed after each miticide application and populations started to build-up again soon after (Figure 1A and Figure 1B). A possible explanation of the high effectiveness of early initiation of spray applications of miticide lies in the fact that CRM densities per tree were low in winter (January to March) when the miticide was applied. Early miticide spray applications during winter may have reduced CRM populations to near zero levels, thus preventing rapid build-up. In addition, the lower temperature and light intensity prevailing in winter relative to spring may have improved the residual control of miticides applied between January and March. In contrast, waiting to detect CRM on fruit before initiating control program may be too late, as CRM numbers may be too high when spray application was initiated. As shown by Figure 1A, an average of 20-30 CRM were counted per three (3) leaves in April at the time of the initiation of spring spray. A comparison of fruit damaged by CRM at harvest showed that hardly any fruit was damaged when CRM control was initiated in January and February (Figure 2). In contrast, when CRM control was initiated in April, about 30% of fruit showed signed of damage despite the fact that overall chemical input was the same in all the months (January, February, March and April).

This study strongly suggests that early initiation of CRM control (January to March) is critical for achieving good season long control. This proactive spray program has additional benefits such as helping with the control of pests such as the Asian citrus psyllid and thrips that infest trees as soon as new flush and bloom are present, respectively.

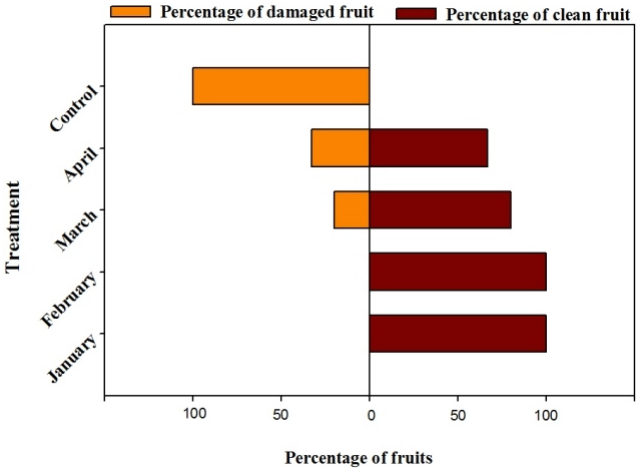

Figure 2: Effects of different spray initiation times on the percentage of fruit damaged by citrus rust mite at harvest

December 2008 Newsletter?

We apologize for not sending out a newsletter last December. We hope all our readers had a Merry Christmas and have had a good start in the New Year

Season-Long Control of Asian Citrus Psyllid in Texas, vector of Citrus Greening Disease

Mamoudou Sétamou and John da Graça

The threat of citrus greening disease (= Huanglongbing [HLB]) in the U.S. requires the development of an effective control program for its insect vector, Asian citrus psyllid (*Diaphorina citri*). Citrus greening disease is probably the most serious citrus disease in the world for which no cure is presently known. Symptoms of affected trees are recognized by asymmetrical blotchy mottle on the leaves and vein corking (Picture 1). Fruit production is dramatically reduced through fruit drop, with remaining fruit becoming lopsided with aborted seeds, and the bottom portion remaining green. In addition, the button holding the fruit to the stem dries up and appears brownish once the fruit is cut open (Picture 2). It is important to note, however, that many other diseases such as Phytophthora or foot rot can produce lopsided fruit, without the other fruit symptoms. Greening-affected trees slowly decline and die within a few years. The disease was detected in Florida in 2005, spreading to most of the citrus producing counties, and in two parishes in Louisiana in 2008. ***As of now the presence of the disease has not been confirmed in Texas, but the long latency period that characterizes the appearance of disease symptom after infection does not authorize inaction in Texas***.

Although there is no known cure for the disease, strong evidence is available worldwide that psyllid control reduces the spread and incidence of the disease. In areas where only the vector is known to occur, it is very likely that effective control of the psyllid vector will substantially lower the risk of the disease. To be effective, psyllid control has to target the pest everywhere it is found including in groves, nurseries, dooryard and public lands. Because of the traditional use of pest control practices in their operations, growers and nurserymen can easily incorporate psyllid control in their pest management programs. ***Psyllid control does not requires any drastic change in your operations, only changes of timing and possibly the addition of few chemical formulations in your tank mixes.***

Several effective chemicals are registered for psyllid control in Texas (Table 1). ***The choice of each chemical will depend on the time of the year and also the array of additional pests you want to target***. In general, broad spectrum insecticides will be used in winter and fall, while insecticides with systemic and translaminar activities will be preferred in spring and summer. ***Psyllid is best controlled just prior to the production of new flush shoots***. The objective is to avoid the reproduction of new psyllid generations on these new flushes. Thus it is important to carefully monitor your groves or plants and spray before feather-like flush shoots are profusely produced. ***Invariably, the first spray of the year is recommended as a dormant spray in January-February before the spring flush***. Subsequent sprays will depend on your grove-care or nursery-care operations. Generally, it is important to plan for a spray application two to three weeks after irrigation or after pruning the trees, as new flush shoot production is expected after these grove care operations. ***We need to always keep in mind that the threat of citrus greening is real, and vector control is currently our available solution.***

Picture 1: Leaf symptom of greening infected trees; Observe vein corking and asymmetrical blotchy mottle

Picture 2: Fruit symptom of greening infected trees; See aborted seed and brownish area at the button location

See Psyllid Page 7

Psyllid From Page 6

Table 1: List of Recommended Chemicals for Psyllid Control in Texas

Active ingredient	Trade names	Efficacy on ACP*	Primary Use	Recommended for ACP in Texas	Comments
Abamectin	Agri-Mek, Abba, Zoro	++	M, I	Yes	Knock down effects only, no long term control observed
Imidacloprid	Provado	+++	I	Yes	
	Admire Pro	+++	I	Yes	For non-bearing trees or nursery plants
Spirotetramat	Movento	+++	I	Yes	
Thiametoxam	Actara		I	Yes	Pending registration
	Platinum		I	Yes	Pending registration
Spinetoram	Delegate	+++	I	Yes	
Siprodiclofen	Envidor	+	M	No	
Fenpropathrin	Danitol	+++	I	Yes	
Formetanate hydrochloride	Carzol	++	I	Yes	
Lambda-cyhalothrin	Warrior	+++	I	Yes	
Aldicarb	Temik	++	M, I	Yes**	Need to be supplemented with foliar spray fter 4 weeks
Chlorpyrifos	Lorsban	+++	I	Yes	
Citrus Oil	Citri-King, Prevam	++	I	Yes	Knock down effects only, no long term residual control
Petroleum spray oil	Orchex NR 435	++	I	Yes	Knock down effects only, no long term residual control
Azadirachtin	Neemix,Aza-Direct	++	I	Yes	Knock down effects only, no long term residual control
Kaolin	Surround	++	I	Yes	No knock down, only deterrence effects on adults
Pyriproxyfen	Esteem	-	I		
Oxamyl	Vydate	+++	M, I	Yes	Excellent knock down
Sucrose octonoate	Sucrocide	+	I		
Imidan	Phosmet	+++	I	Yes***	
Diflubenzuron	Micromite	++	M	Yes	Good knock down, no long term control
Carbaryl	Sevin	+++	I	Yes	
Fenbutatin oxide	Vendex	-	M		
Pyridaben	Nexter	++	M, I		
Spinosad (Mixture of spinosyn A & D)	Spintor	++	I	Yes	
Methidathion	Supracide	+++	I	Yes	
Thiosperse sulfur	Sulfur	+		Yes	

M = Miticide, I = Insecticide; * +++ = very effective, ++ = effective, + = some help, - = no control recorded; ** When Temik is used it is recommended to follow with a foliar knock down spray 30 days after Temik application

*** A 24C is applied for and will be secured soon.

Phone: 956-447-3360 Fax: 956-969-0649

Texas A&M University-Kingsville
Citrus Center
312 N. International Blvd
Weslaco, TX 78596