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STRATEGIC PLANNING FOR THE POSSIBLE OUTBREAK OF CITRUS GREENING IN TEXAS

The detection of citrus greening in Florida in 2005 prompted USDA-APHIS-PPQ to contract the Citrus Center to conduct a survey in 2006 throughout Texas to determine the spread of the Asian citrus psyllid vector of the disease, and whether greening was present. We reported on this survey in the December 2006 issue of the newsletter: http://kcc-weslaco.tamu.edu/Newsletter/2006/December_2006_Vol_24_No_6.pdf

A meeting was held at the Citrus Center on March 28 to lay the groundwork for a Texas response plan for greening control. Ray Prewett, President of Texas Citrus Mutual (TCM), moderated the session. Thirty people including scientists, administrators, industry leaders, growers and personnel from the Texas Department of Agriculture (Dr Shashank Nilakhe) and USDA-APHIS-PPQ (Dr Pat Gomes, Dr Stuart Kuehn & Mr George Nash) participated in this brain-storming meeting. Input from California was obtained through the presence of Dr Magally Williams (CDFA) and the participation by conference call of Ted Batkin (President, California Citrus Research Board). The points of discussion included: the citrus nursery stock as a pathway for greening disease, the status of orange jasmine (*Murraya* spp.) and plans to include it in the "Produced in Texas" label requirement presently enforced for citrus, and lessons from Florida's greening experience. USDA scientists have now established that orange jasmine is a host for greening. A report on the Corpus Christi situation was given where some psyllids collected in the area during the 2006 survey were tested in a USDA-ARS laboratory, and gave a questionable result. The samples were subsequently sent to Beltsville for confirmation, and the USDA-APHIS-PPQ and TDA conducted an intensive psyllid and citrus sampling survey in the Corpus Christi area. The USDA laboratory in Beltsville was not able to confirm any positive results, but the area will be surveyed closely during 2007. Plans were laid to draw up an action plan for Texas, based on the federal plan already devised by the USDA.

Orange jasmine plant infected with greening in Brazil

Amongst other topics discussed were interstate and intrastate movement of regulated plants, the role of growers conducting self surveys, monitoring of packhouses and master gardeners assisting in dooryard surveys.

During the TCM Mid-Year meeting the next day, a panel discussion on greening was held, with presentations from Dr Pat Gomes of the USDA-APHIS-PPQ (federal response to the greening threat), Dr John da Graça (2006 survey results), Dr Mamoudou Sétamou (psyllid control strategies), and Dr Shashank Nilakhe of TDA (citrus budwood and disease regulations).

John da Graça, Mani Skaria, Mamoudou Sétamou & Victor French

MICRO-BUDDED, ULTRA-HIGH DENSITY CITRUS FOR A 15 -YEAR CYCLE

In the mid 1990s, I developed a technique to bud small citrus rootstock, and I named the process **micro-budding**. My rationale behind this line of thinking was prompted by the tree-killing freeze of 1989 and coupled with the success of off-set plantings introduced by Dr. John Fucik, horticulturist at the Citrus Center. I was thinking about a way to get an earlier economic return, cheaper planting costs, and a shorter term orchards. From June 11 to December 16, 1997, several hundreds of small, micro-budded citrus trees were planted in a field. Some of the scions were only a half-inch long when planted, but most had scion growth of six inches or more. All micro-budded trees developed well, and many had fruit in 1999 – two years after micro-budding. One Rio Red grapefruit tree alone produced nineteen grapefruits. Those trees are still alive. See Citrus Industry, March 2000, pages 28-29 and the web site http://kcc-weslaco.tamu.edu/Newsletter/2000/February_2000_vol_18_No_1.pdf for more information. For some reason, micro-budding made the trees more precocious. Planting smaller, budded trees at ultra-high density was a novel approach and moreover, there was no nursery phase at all. With the conditions at the time, the cost of a planting a micro-budded tree became approximately a fourth of the cost of a traditional tree planting. In addition to the tree price, a conventionally planted tree costs approximately $1.25 to $2 for planting labor alone. The planting cost of a microbudded tree can be as little as 10 cents. Many people regarded this approach an innovation and supported the idea in principle; however, it did not click as a commercial venture. Some nurserymen attempted to micro-bud but failed to make a success. However, in 2006, a plant nursery in Texas made micro-budding a commercial success. They are now in a position to provide micro-budded, virus-free trees for commercial planting.

I strongly believe it is time for a drastic change in the citrus industry – a time for an **"Orange Revolution"** in the United States. A fundamental change is needed because many factors are working against making the current citrus production a lucrative operation. This is especially true in Florida with greening, canker, hurricanes, freezes, higher land prices, rapid urbanization of citrus land, labor shortages, and other socio-economic and ecological factors. At present, Texas, Arizona, and California appear to be free from canker and greening diseases, but this is on borrowed time, and moreover, these states have all the other socio-economic and ecological problems that Florida has.

The apple industry in the U.S. made a quantum leap in the 1980s. Starting with a couple of hundred trees per acre in the 1980s, apple orchards have grown to hold up to a couple of thousand trees per acre these days. The apple industry is lucrative with ultra-high density, 15-year term orchards. The apple and other pome and stone fruit growers prefer the opportunity to re-plant with new cultivars every 15 year or so. Fortunately, the apple industry has provided some good lessons for the citrus industry to learn from, and they include: **1)** a need for citrus growers to react to changing situations of disease and socio-economic and ecological pressures, **2)** a need for more dwarfing rootstocks similar to Flying Dragon and US-897 (USDA, Fort Pierce), **3)** an ability to make rapid returns of investments, and **4)** an availability of many newer cultivars to satisfy consumer preferences. The citrus industry has some untapped resources that can be used for a change and they include: **a)** commercial use of the tree stunting capability of transmissible small RNA (University of California-Riverside), **b)** the economic benefits of micro-budded, ultra-high density trees (Skaria, TAMUK CC), and **c)** the use of interstock with dwarfing rootstocks via an inexpensive micro-budding technique. Some innovative citrus growers in this country have already shown success with ultra-high density planting using conventional trees. Now with substantially low-cost, micro-budded trees, I believe it is very realistic for the U.S. citrus industry to embark on an Orange Revolution! Six Texas growers have decided to plant some trials, one has already planted. For a view of a slide presentation on "**High Density Citrus Orchards – A Necessary Change in Texas"** given at the Texas Citrus Mutual mid-year meeting, March 29, Weslaco, TX, please visit http://aghs.tamuk.edu/agro_skaria00.html

Mani Skaria

A micro-budded orange tree planted in the field, March 2007

There is a lot to learn from the Apple Industry

The apple industry has grown ultra-high density trees for decades. Some citrus growers also have done it well for decades. Now, there is a way to make citrus trees cheaper via micro-budding. So, it is time for an Orange Revolution – Mani Skaria, TAMUK Citrus Center

DIAPREPES ROOT WEEVIL UPDATE

Since November 2000, when the *Diaprepes* root weevil was first identified in two citrus groves (Hobbs and Northgate) north of McAllen—a rigorous quarantine, eradication and survey (adult trapping) program has been on-going under administration of the Texas Department of Agriculture (TDA). Special 'Tedders Traps' placed in the groves and dooryards both within and outside (delimiting) the quarantined area are monitored bi-weekly for weevil adults. Monthly totals of *Diaprepes* weevil adult catches for 2006 are summarized graphically in Figures 1-4. In the quarantined Hobbs grove, where there are 20 traps—a total of 7 adults were trapped, with a peak of 5 trapped in November (Fig. 1). In the quarantined Northgate grove, currently with 27 traps—adults were trapped every month except January, April and December, with a peak of 10 adults in October (Fig. 2). In 18 quarantined dooryard sites currently with 94 traps total—adults were trapped in all months except October, with a high of 19 in March (Fig. 3). In 14 delimiting dooryard sites and one grove with 56 traps total— 2 adults were trapped in April, Sept. and Oct. and 1 each in Jan., Feb., and May, totaling 9 *Diaprepes* adults trapped outside the quarantined area in 2006 (Fig. 4).

TDA has now expanded the quarantine and eradication program to include the 14 residential dooryard sites and grove formerly in the delimiting survey area. Trap placement and monitoring for the root weevil are also being increased at these sites. The chemical spray program aimed at *Diaprepes* eradication will undoubtedly also be intensified. Currently two foliar spray applications are made (generally in April and August) to kill adults, eggs, and newly emerged larvae (neonates) on the leaves. As an added precaution, each foliar spray is then followed by soil chemical spray treatment acting as barrier to kill and prevent the 'root-feeding' *Diaprepes* neonates from entering the soil beneath the tree canopy. In groves, Lorsban 4E (chlorpyrifos) or Carbaryl 4L tank mixed with Micromite WGS (diflubenzuron) and Petroleum Spray Oil are applied as foliar sprays; and Capture (bifenthrin) as the soil barrier spray treatment. In quarantined dooryards, either Sevin 80S (carbaryl) or Talstar (bifenthrin) is applied as the foliar spray on yard trees, shrubs and ornamentals, with Talstar also applied to the soil beneath the tree/plant canopies. All spray applications made in residential dooryard sites are currently under contract with a licensed pest control company.

In the near future we plan to obtain and release a wasp parasitoid, *Quadrastichus haitiensis*, that attacks the eggs of the *Diaprepes* root weevil. This will be a collaborative research project with scientists at the USDA APHIS PPQ Pest Detection, Diagnostics and Management Laboratory , Edinburg, TX. More information on this project will be forthcoming in future Newsletter articles.

Figure 1. Diaprepes Root Weevil Trapping 2006
Monthly Totals: Hobbs Grove (Quarantined)

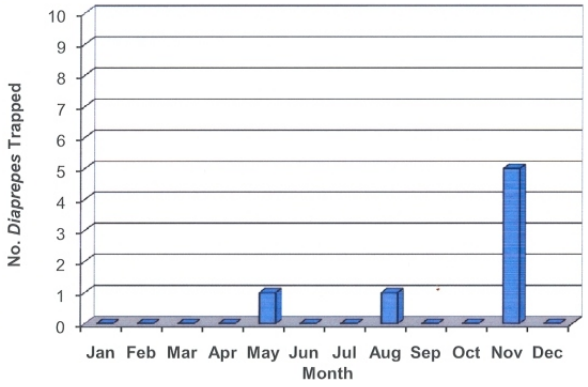


Figure 2. Diaprepes Root Weevil Trapping 2006
Monthly Totals: Northgate Grove (Quarantined)

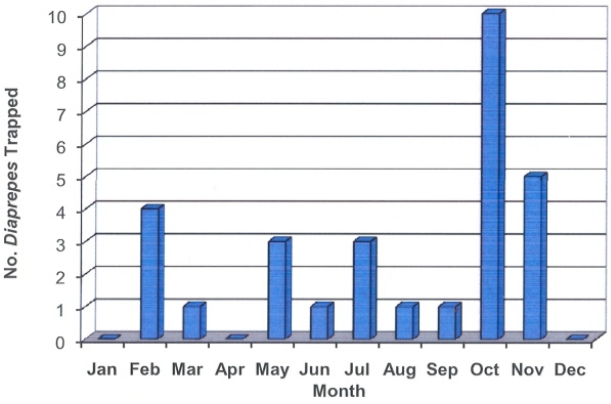


Figure 3. Diaprepes Root Weevil Trapping 2006
Monthly Totals: Dooryards (Quarantined)

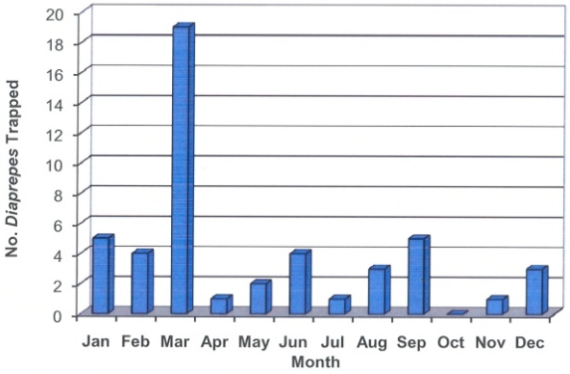
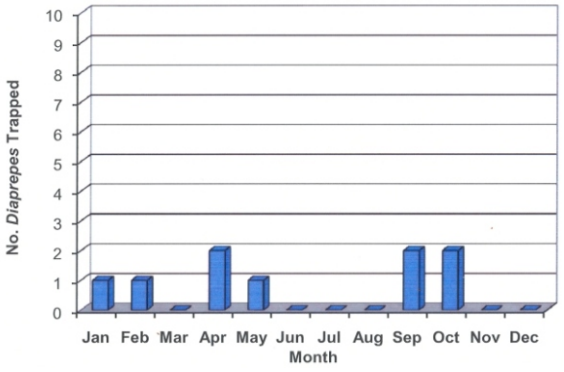


Figure 4. Diaprepes Root Weevil Trapping 2006
Monthly Totals: Delimiting Dooryards



J. Victor French and Mamoudou Setamou

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