Florida growers tour Brazil The Araraquara area has had greening longer and a higher greening infestation rate than other parts of Brazil. Numerous small groves or

By Steve Futch

group of Florida citrus growers in May traveled to Brazil to see firsthand the problems confronting the Brazilian citrus industry. This tour was similar to others that

have now taken more than 55 production managers, industry leaders, suppliers and trade organizations on visits to Brazil's citrus area as part of the University of Florida's Extension county programs. Those who have visited Brazil on these tours represent 45



Group photo at Cocamar grower cooperative processing plant in Parana. Left to right, Frank Miele, Steve Futch, Stanley Perry, Derrell McCullough, John Smoak, Julia Baretta, Gary Cooper, Cocamar director Antonio Ailton "Tuna" Basso, Rui Leite Jr. (IAPAR) and Cocamar agronomist "Junior".

percent of the management of Florida's citrus acreage.

Brazil is the leading orange juice producer in the world and is battling citrus greening (Huanglongbing) and other diseases and pests. While both Brazil and Florida have the same Asian form of greening (Candidatus Liberibacter asiaticus), Brazil has an additional type of greening, the American strain (Candidatus Liberibacter americanus). The Asian form is the predominate strain of greening.

Brazil reported its first greening in 2004 in the state of Sao Paulo near Araraquara, which is a three-hour drive north of Sao Paulo city. Greening was not reported in South Florida until 2005 near Florida City.

economically viable with production costs at current fruit prices. They also indicated that neighbors' psyllid and greening control programs have a major impact on their operation if greening or psyllid populations are left uncontrolled. This underscores the importance of area-wide or coordinated psyllid programs in Florida's greening battle.

significant numbers of trees have been

removed in many blocks to combat

the disease. A few Brazilian growers

expressed concerns about controlling

greening, which allows them to remain

Orange Jessamine (Murraya) plants test high for the pathogen and are a host for psyllids. In some locations, Murraya plants are removed from urban plantings as they pose a significant risk to commercial citrus plantings.

Since greening was first reported, many Brazilian citrus growers have adopted vigorous production programs



(Left to right) Lake Placid growers Derrell McCullough, John Smoak and Stanley Perry study and discuss citrus in a Brazilian grove.

to slow the disease spread. These include:

1) planting healthy trees produced in structures excluding the vector, citrus psyllid;

2) aggressively controlling the psyllid by multiple pesticide applications





Left, Julia Baretta, tour interpreter and guide. Baretta is very well versed in both the U.S. and Brazilian citrus industries. Right, tour planner, UF/IFAS multi-county citrus extension agent Steve Futch.

targeting psyllid adults and nymphs; 3) surveying citrus properties to detect greening positive trees; and 4) removing greening positive trees.

TREE REMOVAL LAW

Recently, a new law (#53) was established. If more than 28 percent of the trees in a single visual inspection are greening positive, the entire block must be removed at the grower's



Sao Paulo skyline



Orange grove in Brazil



Yellow dragon



A grove with windbreaks

expense without financial compensation for tree loss. Removal of the block is immediate and can't be delayed for fruit harvest.

INSPECTION FOR CITRUS PSYLLID

In groves actively surveyed for psyllids, inspection is based upon 1 percent of trees within a block, selecting three branches per tree to be inspected. Inspections for psyllid adults and nymphs are conducted on 15-day intervals. Special inspections are needed when new flush is present. Sticky traps are used in some locations with green (more efficient than yellow) sticky cards.

PSYLLID CONTROL

Depending on location, greening levels and psyllid numbers, growers may apply up to 12 or more pesticide applications annually. These applications are combined with other pest control programs. Growers make a pesticide application upon finding a single adult psyllid. Applications by fixed wing aircraft are done in larger plantings.

After planting, young trees will receive multiple yearly systemic applications during the growing season. Growers seem to agree that these systemic programs in the first years of planting are effective in protecting young trees from infection.

GROVE SURVEY

Growers agreed that surveying for greening is optimized in mature trees by surveying from an elevated platform versus walking the block. Walking is the preferred method for surveying in young trees during the



Inarching to combat sudden death

first four years. When surveying, both sides of the tree are observed. Per-tree survey cost was estimated at 2.5 cents per tree for young trees by walking and 5 to 8 cents per mature tree using an elevated platform.

NURSERY TREE PRODUCTION

All citrus nursery trees sold in Brazil since 2004 are required to be produced in enclosed structures. These structures are very similar to those now required in Florida and are designed to exclude pests from entering the structures. While greening is a major reason to produce disease-free trees, the rule was actually adopted in Brazil to minimize the spread of citrus variegated chlorosis (CVC), which is vectored by various sharpshooters. Cost for nursery trees in Brazil is about 25 percent of what a Florida grower pays.

CVC

Citrus variegated chlorosis is caused by a bacterium, Xylella fastidiosa, which affects the xylem (woody, water-conducting part of the plant). Trees affected by CVC have reduced vigor; leaves turn yellow and twigs dieback. The fruit produced on infected parts are smaller with large brown spots. In contrast to citrus greening, a control strategy is to remove affected parts of the mature tree by cutting back behind the symptomatic tissue near the tree trunk. While pruning can be effective in controlling CVC in early infection on mature trees, young trees affected are removed because pruning infected parts is not effective. Pruning is not effective in controlling greening in Brazil or Florida.



Multiple blooms on pera orange

CITRUS CANKER

In the state of Sao Paulo, citrus canker is under mandated eradication programs. When canker is found, removal around canker positive trees starts. Growers are responsible for field and government inspections. Tree removal is the growers' responsibility; they receive no compensation for the removed trees.

In the neighboring state of Parana, growers are living with endemic citrus canker. In this state, growers apply mul-tiple applications of copper to suppress the disease, plant windbreaks and prohibit planting varieties like Hamlin which is susceptible to the disease. Over the years, researchers have selected varieties that can be produced in the presence of endemic canker like IAPAR 73, an early maturing round orange variety. Additionally, several agricultural cooperatives are encouraging and financing area farmers to diversify their operations by planting citrus.

OTHER PESTS

Other major citrus pests and diseases in Brazil include black spot, leprosis and post bloom fruit drop.

By visiting other citrus production regions, Florida growers gain a better understanding of current and potentially new pests and diseases. The Brazilian industry is openly sharing its experiences, successes and failures with all citrus regions around the world. These international exchanges are essential in the effort to effectively combat citrus greening and other diseases.

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