

Rebirth of the satsuma industry?

By Jake Price, Matt Lollar and Gary England

A 2005 Institute of Food and Agricultural Sciences news article stated that prior to a devastating freeze in 1935, Florida's Jackson County was considered the "Satsuma Capital of the World," boasting a significant portion of the reported 3,000 acres in production in the Florida Panhandle region at that time. The industry virtually disappeared after the severe freeze of 1935. Currently, a few growers in the region have decided to evaluate satsuma mandarins as an alternative to traditional row crops.

Over the years, Pete Anderson, University of Florida Institute of Food and Agricultural Sciences (UF/IFAS) researcher at the North Florida Research and Education Center, and several Extension agents have assisted Panhandle growers interested in producing satsumas. In the last three to five years, University of Georgia Extension personnel have had numerous growers approach them about initiating satsuma production in the southeastern portion of the state. Several groves have been established in the Valdosta, Georgia, area and other locations in the region.

In August 2013, a satsuma production meeting was held in Valdosta. The meeting was a result of cooperation between Lowndes County Extension in Georgia, Madison County Extension in Florida and Loch Laurel Nursery in Lowndes County. The meeting addressed the possibility of growing satsumas in the area. As anticipated, there was great interest in satsumas as participants came from all over southern Georgia as well as northern Florida and Alabama.

QUANTITIES AND VARIETIES GROWN

Since 2013, satsumas have been planted in 14 Georgia counties. The best estimation is that there are 25 growers and approximately 80 acres of satsuma trees in Georgia, with less than 10 acres of commercial trees greater than 5 years old (Figure 1). Most growers are small landowners who are looking for alternative income. Other growers already have blueberries or pecan operations and are adding satsumas.

The predominant variety is the tried and true Owari, which represents about 75 percent of the trees planted. Brown Select

accounts for approximately 15 percent of the planted acreage. Owari ripens in mid-November, and Brown Select about one week earlier. There are virtually no research data from Georgia on satsuma production, so much of the knowledge comes from sources in Alabama and Louisiana, and experiences with the thousands of dooryard citrus growers in the area.

Already, growers are seeking out earlier ripening varieties to extend the harvest season. Additional varieties that Georgia growers have planted so far are: LA Early, Early St. Ann, Armstrong, Xie Shan, Miho, Miyagawa, Shiranui and China-9. These selections are expected to ripen in October in south Georgia. These varieties, along with some grapefruit and navel, make up about 10 percent of the citrus planted in the region.

There has been an increase in demand for satsuma trees on trifoliolate rootstock. With limited supplies in Georgia, growers have looked to Alabama, Louisiana, Texas and Florida for their satsumas. Growers are well aware of HLB and other citrus diseases that can be brought into the state. Therefore, trees are typically purchased from nurseries approved by the U.S. Department of Agriculture (USDA) to ship into Georgia.



Figure 1. Alex and Thomaso Ventura harvest satsumas at the Joe Franklin Grove near Statesboro, Ga.

FREEZE DAMAGE

The winter of 2014 proved to be quite a test for the newly planted trees. On November 19 and 20, much of the satsuma-growing region experienced temperatures ranging in the mid- to lower 20s with a couple of counties in the eastern part of Georgia reaching 19 degrees. A hard freeze this early in the year is not the norm for southern Georgia. First frost typically occurs around Thanksgiving, and the hard freezes usually occur from late December to February when trees are fully dormant.

Georgia satsuma trees were not fully dormant in November 2014, which made the hard freeze even more serious. For the most part, the majority of the newly planted satsuma trees survived the winter of 2014, but some lost leaves, others suffered stem dieback and some were completely killed.

From observations and conversations with growers, there were several factors that contributed to tree loss. Some trees did not have freeze protection. Others had freeze protection, but growers elected not to use it because several forecasts for the night of November 20 indicated temperatures would be in the high 20s, when temperatures actually reached the mid-20s.

Some growers with trees on Carrizo rootstock suffered tree loss. Many of the trees on Carrizo were in southeast Georgia, where the lower temperatures were recorded. Other factors contributing to tree loss were late-season fertilizer applications and planting in low areas. Trees without windbreaks also had more damage.

PEST PROBLEMS

The major insect problem has been citrus leafminers. They tend to leave the first growth flush alone, but every flush after that is almost guaranteed to be damaged by these pests. With most of the trees in the area being young, they are more vulnerable to leafminers.

Spider mites have also been a problem, as well as orangedog

Advancement of Bactericides for Possible Special Local Use Needs in Citrus

By Harold Browning



Investment by the Citrus Research and Development Foundation (CRDF) in identifying and evaluating candidate bactericides for therapy of HLB-infected trees continues, and this column provides an update on the processes and progress.

CRDF's Commercial Product Delivery Committee has had bactericides on its priority list for several years now, as there are few interventions that can target the *Liberibacter* pathogen within citrus phloem where infection resides. Chemical therapy, along with the use of heat therapy, has as a goal the reduction in bacterial population levels within infected trees, thereby providing trees an opportunity to resume growth and perhaps postpone the expansion of disease. While efforts in other countries using chemical therapy for huanglongbing (HLB) have not been highly successful, this is one of few interventions that can be directed to current inventories of citrus trees infected with HLB bacteria.

CRDF has established a well-organized process to support the full range of bactericide evaluation, from conducting a series of assays to determine the relative effectiveness of a wide range of candidates, to progressively advancing the most promising candidates to field trials. Biological evaluation is at the heart of this project, but simultaneous development of commercialization and regulatory approval support and information also are being considered. This topic is being managed through commitment of a full-time CRDF bactericide project manager, Dr. Stephanie Slinski.

Field trials conducted over two years are providing evidence for the effectiveness of two traditional bactericides, streptomycin and oxy-tetracycline, that are registered for use in agricultural crops other than citrus. CRDF, working directly with commercial registrants of these materials, has supported the necessary studies to determine efficacy against HLB with standard field-use methods, rates and timing, as well as the evaluation of product residues following field application. These areas are fundamental to making sound decisions to go forward with further testing and, ultimately, to seek registration for use in Florida citrus for these materials.

Well into the second year of testing, CRDF is working closely with parties who have a role in moving research from promise to utility, whether through full registration or through emergency use requests for special local needs. Florida Fruit and Vegetable Association (FFVA) regularly works with Florida agricultural industries on labeling of pest and disease management tools, providing for the assembly of information and data necessary to petition for special-use consideration. FFVA has been fully engaged with CRDF on evaluation of the readiness of bactericidal products for use in Florida citrus against HLB. Equally important to this effort are the pesticide registrants who have registration of these products with the U.S. Environmental Protection Agency (EPA) for other crops, and the Florida Department of Agriculture and Consumer Services' Pesticide Registration Division, which oversees consideration for use of pesticides in Florida and special local needs situations. Ultimately, EPA is the authority for pesticide registrations.

Over the next two months, CRDF will be working with these parties to compile the portfolios of support data and needs assessment necessary to make a case for emergency registration of one or more of these materials. Our goal is a decision that would allow rapid advancement of the best candidates to consideration for special registration for use in the 2016 citrus season.

Harold Browning is Chief Operations Officer of CRDF. The foundation is charged with funding citrus research and getting the results of that research to use in the grove.



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caterpillars. Many growers are using materials recommended in the Florida Citrus Pest Management Guide (www.crec.ifas.ufl.edu/extension/pest) for insect and weed control.

At this time, there has been limited disease pressure, but only a few growers are producing fruit. Homeowners with fruit problems typically have rust mites and citrus scab.

Growers have been encouraged to scout for citrus psyllids on new growth, but there have been no reports of anyone finding them yet. When they are detected, it will greatly change the insect management program.

POTENTIAL MARKET

Most south Georgia groves are still a few years away from fruit production. However, in meetings, discussions about avenues to market the fruit have taken place. Food and nutrition programs at schools would be a possible outlet for fruit, but school food service directors say they would prefer purchasing fruit from one entity (like a co-op) rather than several individuals.

Recently, a meeting to discuss forming a co-op was held, as most growers have small acreage. Most participants seemed open to the idea of a co-op, but this is still in the very early stages. Some growers have their own ideas of how they will sell their fruit.

ROOTSTOCK EVALUATION

Considering that there is limited information on satsuma, a test plot at J.L. Lomax Elementary School in Valdosta has been initiated by Jake Price, University of Georgia Extension agent, to evaluate Owari 874 on 10 different rootstocks. Rootstocks being tested are Carrizo, sour orange, Rubidoux, Cleopatra, Swingle, X-639, US-897, US-852, US-812 and US-942 (Figure 2). Kim Bowman, USDA rootstock researcher, has helped design the plot and has given some needed guidance.

Phillip Rucks and Briteleaf citrus nurseries have helped to obtain plants. Mark Crawford, of Loch Laurel Nursery in Valdosta, has been a tremendous help as well as local



Figure 2. Jake Price, University of Georgia Extension agent/coordinator for Lowndes County, evaluates a satsuma rootstock trial.

Georgia businesses that have donated money and resources for this project. There have been great volunteers, such as master gardeners, who helped with planting and maintenance.

Six rootstocks were planted last summer (2014) and they all survived the winter with freeze protection. Visual evaluations in early spring indicated that after a harsh winter, US-812 fared freezing conditions the best. But by June of 2015, all were growing well. Windbreaks for cold protection are being established. Black landscape fabric for weed control, and potentially to assist with heat retention during freezes, has been installed.

To date, nine of 10 rootstocks for evaluation in the trial have been planted. Rubidoux, which is not widely available in Florida, is scheduled to be planted in the spring of 2016, thus completing the initial rootstock trial block. Rubidoux is a very popular rootstock in other areas where satsuma is produced, but all plants in the project are required to originate from USDA-approved facilities, thus delaying its planting until 2016.

SATSUMAS IN FLORIDA

Matt Lollar, UF/IFAS Extension agent in Jackson County, reports that there are approximately 18 acres of satsuma planted in four groves in

Jackson County. He indicates that Owari makes up about 50 percent of acreage, followed closely by Kimbrough at approximately 40 percent. Brown Select rounds out the acreage at 10 percent. The majority of the plantings are on trifoliolate rootstock.

The major production challenges to growers are the management of whiteflies, red mites and stinkbugs. At this time, marketing of the crop is a major limiting factor to the expansion of the industry in Jackson County. The Florida Farm to School Program has been utilized to some success. Satsuma box pre-sales through school fundraisers have also been successful.

There has been interest in satsuma production across all of north Florida, and with production in south Georgia and Alabama, there could once again be a viable industry in the region. The UF/IFAS Canker and Greening Extension Program, research specialists and Extension agents have been providing support to Extension programs in south Georgia and other locations interested in producing satsuma. 🍊

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