

Grower trials, tribulations and observations

Controlling greening and psyllids – grower programs

By Steve Futch

Citrus greening is one of the most devastating citrus diseases worldwide and is being found with greater frequency throughout Florida. While some growers in Central Florida may not have seen greening in their groves, it most likely could be found by properly surveying the entire grove. Growers must take this disease seriously and aggressively control the psyllid that spreads it while taking steps to reduce the source of the bacterium by removing infected trees.

In an effort to manage greening, Steve Farr, production manager for Ben Hill Griffin, Inc. in Frostproof, outlines some of his company's practices. These practices are very similar to those of other citrus organizations around the state and are presented here to inform growers of programs being conducted to control psyllids and greening in Florida.

SURVEYING

In an effort to detect positive trees in the groves owned or operated by Ben Hill Griffin, Inc., the company has instituted an aggressive scouting program to survey all of its property three to four times per year. The survey crew consists of 10 scouts and one supervisor. The scouting crew operates a tractor-mounted elevated platform to allow better observation of the canopy and tops of all trees and is used in conjunction with ATVs. When scouting large trees, every other row middle is scouted using a platform allowing the top of each tree to be seen and ATVs are in alternate middles. This scouting system allows 70 to 80 acres to be visually checked on a daily basis.

Once trees are found that exhibit greening symptoms on the foliage or fruit, the tree is marked by the scouting crew and then later confirmed by the supervisor. All identified trees are sufficiently noted with flagging tape and the scout's name to better aid in training and evaluation of employees. The ends of all rows containing suspect trees are also marked with the number of trees on each row to make finding the trees for sampling and tree removal easier. The supervisor will record the location of all marked trees and collect

samples for laboratory confirmation. All sampled trees will have the location recorded using a hand-held GPS unit for maps to be developed later using Google Earth. These maps will allow for distribution within a given location over time to be analyzed.

When evaluating the marked trees, tree condition is evaluated and recorded to aid in determining the impact that greening is having on the grove and its future yield potential. These marked trees are ranked on a 1 to 3 scale where 1 is lightly infected and 3 is severely affected. Trees declining due to other diseases or disorders are also noted to estimate tree losses due to other factors besides greening.

The suspect trees will have samples collected for laboratory analysis to confirm observations. The in-field iodine test is also conducted on all trees that are suspected to have greening. While this test is not 100 percent, it does provide additional information to aid in determining if the trees do have greening and provide quick feedback to the scouting crew. Once the tree is confirmed positive for greening by laboratory testing, it is removed. Removal is done by clipping the tree off above the soil with a tree shear mounted on a front-end loader. After clipping, the stump is treated with herbicides to minimize sprout regrowth. Trees that are determined to be HLB negative by laboratory testing are carefully inspected and later re-inspected to assure they remain negative over time.

While surveying is important, just as vital is to ensure the survey crew is continually trained, retrained and cross-trained to make sure it is efficient. With some of the symptoms changing with season, constant re-training is essential. When inspectors key in on fruit symptoms, this identification method is not possible after harvesting and cannot be used until the next crop becomes large enough to observe symptoms either from lopsided fruit, smaller size or off color.

GREENING OBSERVATIONS

Farr indicated that in some locations, the incidences of greening may be found at a greater frequency in more southern groves in south Highlands and Charlotte counties as compared to those located in Central Florida. However, greening has been found in company groves in every county where they have citrus production as far north as Lake Wales.

When greening is found, it is often first found in the weaker areas (sand soak or nematode infested areas) of the grove, along borders or adjacent to open fields or woods. However with that said, it is not always the case and may vary by location. These observations are similar to what production managers in other locations have indicated. A suggestion has been made that the trees along ditch banks often exhibit a lighter green color due to soil issues and high pH that may result from the bedding process when the

Typical spray programs for psyllid control

Month	Chemical active ingredient	Other pests suppressed or controlled
December/January	Fenprothrim (Danitol)	Flower thrips, adult root weevils
January/February	Aldicarb (Temik)	Mites, nematodes, aphids
April	Carbaryl (Sevin)	Adult root weevils, scale insects
May/June	Abamectin (Agrimek, Abacus) Imidacloprid	Mites, citrus leafminer Aphids, citrus leafminer
July	Dimethoate	Some scales, aphids, flower thrips
August/September	Oil Carbaryl	Mites, citrus leafminer Root weevils, orangedog, katydids
September/October	Envidor Imidacloprid	Mites Aphids, citrus leafminer

grove was developed. Some have speculated that the psyllids are attracted to yellow and hence these trees may be more attractive to the psyllid as compared to healthy trees with dark green leaves.

In some Ben Hill Griffin groves, the October survey found only a few trees with greening symptoms. In one 40-acre block located in Avon Park, only five trees were identified as positive, whereas, the subsequent February inspection yielded 20 trees. This same level of increased incidence has been noted in other groves. This increase in tree number has left many unanswered questions as to the latency period within the tree from the time infection occurs until the symptoms become visually apparent. In all locations, if one or more trees were found positive from the first inspection October-January, more positives are being found in the second inspection February-April, sometimes five to 10 times more trees on the second inspection. Since Ben Hill Griffin, Inc. started the inspections September 2007, it has found approximately 650 positive greening trees in Polk, Highlands, DeSoto, Hardee and Charlotte counties.

PSYLLID MANAGEMENT

Steve Farr has indicated that the company has been applying additional sprays for the past one-and-a-half years to suppress psyllids. Typical spray programs are in the accompanying table on facing page.

The typical program begins with a December/January spray with Danitol to reduce the overwintering population of psyllids. By reducing the adult population, the subsequent populations will be lower and also reduce the number of eggs that will be produced with time on later flushes. This mid-winter spray is most likely one of the most important sprays of the year. Generally, after the Danitol spray in January, little to no psyllids were seen in groves with or without Temik until mid-April. The big exception to this was observed in areas around groves not spraying for psyllids.

Other sprays are applied as warranted and are continually evaluated as to performance. Growers need to minimize sprays during bloom periods as some products may

have an adverse effect on bees. In some cases, eggs and nymphs may be found in any feather flush two to three weeks after spraying, especially when plants are actively growing, or in groves adjacent to groves not managing psyllids, making long-term psyllid control very difficult.

In cases where the grove has been hedged during the spring and summer, special attention must be paid to that re-growth. Once the trees flush, additional sprays will be necessary to minimize psyllid infestation on the new growth that emerges three or four weeks after hedging. This off-cycle flush adds additional sprays and costs to the above program.

When spraying for psyllids, spray volumes have been reduced to 100 gallons per acre (gpa) from a standard 166 gpa with airblast sprayers. Likewise, ground speed is increased from a standard speed of 1-1.5 to 2.25 to 3 mph. Volume and speed have been altered based upon the assumption that control of psyllid does not require the same coverage as other pests. These changes in speed and gallonage allow for a greater number of acres to be covered in a day while reducing application costs. With the additional sprays, scale insects are being found more frequently due to the adverse impact sprays may have on beneficial insects. Scale increases have been noted with snow scale and many of the soft scales, including soft brown and cottony cushion, being found.

YOUNG TREE PROGRAMS

Young trees have more frequent vegetative flushes and will require more frequent sprays to maintain them psyllid-free. In solid set young tree locations, for the first year after planting, the trees will receive four applications of imidacloprid (Admire) at two-month intervals. In addition to this soil-applied systemic material, young trees will be sprayed with a hoop boom every five to six weeks with a mixture of insecticides, nutritional and disease control materials. As the trees age, the application rate of imidacloprid will be increased, thus reducing the number of applications allowed per 12-month period as stated on the pesticide label.

Scattered resets will be more prob-

lematic as applying pesticides to these trees with foliar applied materials is more difficult and expensive. During the spring season, a number of trials were conducted utilizing Temik that was soil incorporated near the tree trunk of young and reset trees. These trials will be extensively evaluated prior to next year's application.

INFECTED TREE REMOVAL

After the trees are confirmed to be positive for greening, they are removed using a standard tree shear. To assure all positive trees are removed and recorded, an additional individual follows the loader within the grove. This individual will repair broken irrigation, move the poly tube and spray the cut stump with herbicides to assure the stump will not resprout. In some cases for very old trees, the tree shearing equipment has difficulty clipping the tree smoothly and may lead to less than optimum translocation of the chemical into the cut trunk. Root sprouts or sprouts from the cut stump are a major concern as these sprouts will likely contain the greening bacterium.

ABANDONED AND MINIMAL GROVE CARE

Growers who own blocks surrounded by abandoned groves or groves that lack psyllid management programs will most certainly have greater psyllid management issues as compared to groves located where growers collectively manage psyllids. In locations where these properties are present, psyllids may reside in adjacent properties and then migrate to your property with time. This issue must be collectively addressed within the entire industry.

Farr indicated that greening and psyllid management are not easy tasks. At times it seems like the more we learn, the more we need to learn. While questions are being answered, more questions remain to be answered. Growers who wish to remain in the citrus business must aggressively develop programs to control psyllids to remain profitable in the long term.

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