Texas A&M University-Kingsville



'Out of the bag: the quarantine pest *Diaprepes* root weevil found in Bayview area'

M. Sétamou. J.V. French and M. Skaria

The Diaprepes root weevil, Diaprepes abbreviatus, was first reported in the Lower Rio Grande Valley in November 2000 in the northern side of McAllen. Adult Diaprepes feed on tender foliage of its host plants, including citrus, causing leaf notching. But the root weevil is economically important because of the damage caused by its larval stage. Diaprepes larvae feed on roots of infested trees producing extensive galleries or channeling on major and feeder roots. These channels facilitate infection by the fungus Phytophtora in the roots, which subsequently weakens the tree by impairing the water and nutrient uptake. Affected trees slowing decline and die in 1 to 3 years. Because of its high damage potential to citrus, Diaprepes has been a quarantined pest since its introduction into Texas. For the past 8 years, an ongoing eradication program has been successful in keeping the pest within the area of its initial discovery.

In the past few weeks, a concerned grower has notified the Citrus Center that some trees have been slowing declining and dying (Figure 1) in Bayview about 50 miles east of the original quarantine area. On 30 September 2008, Citrus Center staff visited the orchard and examined the trees. Because no visible symptoms were apparent on the trees, they decided to pull out some trees for examination. The roots of those trees were extensively damaged by larvae (Figure 2). In addition, nine Diaprepes larvae were recovered from the root zone of three uprooted trees (Figure 3), and three adults were caught from the foliage of two trees (Figure 3). The Diaprepes samples were identified by Dr. M. Sétamou and later confirmed by Drs. French and Skaria.

These worrisome findings have been immediately reported to the Texas Department of Agriculture (TDA). A joint team of TDA and Citrus Center personnel went to survey the orchards located in the vicinity of the detection sites. Diaprepes traps have been deployed in three orchards situated in the area to monitor adult population.

TDA has already delineated and enacted another quarantine area for an aggressive eradication program in the infested area.

Growers' Self Surveys Recommended

This fall, the Texas A&M University-Citrus Center will conduct a valley-wide survey to determine if Diaprepes root weevil is present beyond the two established quarantined areas. However, we encourage growers to conduct self surveys and notify us when suspect symptoms or insect pests are found. Classic symptoms of the Diaprepes root weevil infestation include a gradual decline of the entire trees, leaf notching on young foliage with presence of dark green frass on leaf surface. Although we have two indigenous weevil species namely the golden headed weevil (Compsus auricephalus) and the Mexican root weevil (Epicaerus mexicanus) that cause leaf notching, the leaf damage resulting from the Diaprepes root weevil is more severe. At times, adult Diaprepes weevil can also be seen feeding or mating on the foliage.

Immediate Action Recommended for Control 1. Soil Treatment

The synthetic pyrethroid, bifenthrin (formulated as Capture[®] 2EC) has shown some good efficacy as a soil

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barrier treatment. It is applied beneath the tree using a herbicide applicator to achieve uniform coverage and can the compound will persist at the point of application by drying on soil particles. Only one application at the rate 1 quart per acre is permitted a year. Because larvae feed exclusively within the root zone in the soil, we recommend the use of Capture to target these larvae.

2. Foliar Sprays

Foliar sprays should be conducted when adults are present. Visual sighting of adults or trap catches data should determine the time of application. The following insecticides can be used:

Sevin 80S (Carbaryl) at the rate of 3.57 to 6.25 lb. per acre

Micromite 80WGS at the rate of 6.25 oz per acre

Mustang Max at the rate of 2.8 to 4 oz per acre

Sevin and Mustang Max will give immediate kill to adults. Micromite as a growth regulator will affect the fertility of eggs. For best results, Micromite is mixed with petroleum spray oil. Petroleum spray oil when applied to citrus flush discourages egg deposition on treated surfaces and interferes with the cementing of leaves together leaving the egg mass vulnerable to environmental effects and predation.



Figure 1: Declining tree following root damage by Diaprepes larvae



Figure 2: Extensive root channeling caused by Diaprepes larvae



Figure 3: Diaprepes root weevil larva (left) and adult (right)

Recent Rain Impact on Citrus Tree Death and Other Issues

Mani Skaria

Hurricane Dolly, together with pre- and post-hurricane rainfall contributed 47-51 inches of rains in some Valley orchards. Unfortunately, some of those orchards are in low spots. As a result, growers have lost many trees from Rio Hondo to Mission. The following map is an affected, young Rio Red orchard in Rio Hondo.



Green indicates apparently healthy trees, yellow means dying trees and red means trees that are already dead. Out of 945 Rio Red grapefruit plants in this orchard over 30% are dead or dying (see pie chart below).



Too much water and standing water for a longer period of time can result in increased foot rot, root rot and brown rot of fruit, caused by *Phytophthora*.

Other Diseases are also Impacted: Citrus greasy spot, caused by fungus *Mycosphaerella citri* and melanose caused by fungus *Diaporthe citri* are controlled by regular sprays with systemic fungicides. An inability to get the tractor and sprayer into the orchards will increase the incidence and severity of these two diseases. Both greasy spot and melanose infection downgrade the crop to juice fruit.

Background Information for Economic Assessment: Several orchards in the Valley, from Rio Hondo to Mission lost 100% of trees as a result of many days of standing water. Replanting in such orchards should be carefully evaluated, especially for *Phytophthora* control and proper drainage to avoid future problems.

Citrus Center and Weslaco East High School Partner to Assist Special Needs Students

John da Graca

The Head of the Weslaco East High School Special Education Department, Ms Nancy Vela, invited the Citrus Center to participate in their "On-site Community Education Skills Program". Every morning two students spend 2 hours at the Center under the supervision of their teacher, Mr Sergio Bautista, learning nursery skills. A total of eight students will participate in the program at the Center this semester. They are following all the stages of tree production, from planting the seed, through transplanting seedlings, grafting and on to planting the trees. The students have already successfully established vegetable gardens at their school, and participating in real-life work activities shows them that raising plants outside school is a genuine work activity.



Ismael "Smiley" Castaneda (left) transplants a citrus seedling, with the help of Ruben Gonzalez

Psyllid and Greening Survey Update

John da Graça, Mamoudou Sétamou and Mani Skaria

The current USDA-APHIS-PPQ funded survey for citrus greening and the Asian citrus psyllid is now well way. We have hired three full-time (Billy Euler, Andrew Parker and Jose Sandoval), and two-part time (Rene Soza, Joshua Hinojosa) assistants, and, together with our own Daniel Davila, they have been on the road recording the presence of citrus and the Asian citrus psyllid, and collecting sample for greening diagnosis. So far, they have travelled to counties in central, east and west Texas, and have recorded psyllids for the first time in ten of them, making a total of 43 counties where they have been detected. The new finds include Brazos County, the most northerly record so far, and Presidio County out west. Citrus has also been documented in 108 Texas counties, but we are certain that trees in doorvards and containers exist in other counties that have not yet been surveyed. The map of Texas shows counties where citrus is known to occur, and where psyllids have been recorded.

Surveys are also continuing in citrus orchards in the Valley. At the same time, the USDA-APHIS-PPQ is conducting a separate survey of citrus in residential properties in the cities of the Valley, and any suspect leaf samples are being sent to the Citrus Center for diagnosis. So far, greening has not been detected in any of the samples tested.

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