Florida Citrus Advanced Technology Program

QUARTERLY & FINAL REPORTS: Control of Citrus Greening, Canker & Emerging Diseases of Citrus

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2009-2010 REPORT	CATEGORY (drop-down)	TODAY'S DATE (m/d/yr)
● *Quarterly Report* ○ *Annual Report* ○ *Final*	Psyllid	

WHAT IS THE "HEADLINE" FOR THIS REPORT (e.g. a one-sentence "newspaper headline" describing what you accomplished)

Insecticides interfere with the probing behavior of Diaphorina citri and is efficient to control the vector.

TITLE and CONTACT INFORMATION

Proposal Title CAN INSECTICIDES AND MINERAL OIL AVOID TRANSMISSION OF Candidatus Liberibacter asiaticus BY Diaphorina citri?

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Organization Fundecitrus	*Total Direct Funds (current year)* US$ 17,710.00

REPORT UPDATE (650 words; provide details about your headline)

The first experiment that was conducted to know the efficiency of systemic insecticides to control the Asian Citrus Psyllid (ACP), Diaphorina citri, and its effect on transmission of the bacteria Candidatus Liberibacter asiaticus, indicated that imidacloprid (Confidor 700 GrDA), 0.35 g AI/plant and thiamethoxam (Actara 250 WG) 0.25 g AI/plant, applied in the nursery tree bags, before planting, was efficient to control ACP until 60 days after application. The time to cause 100% of ACP mortality was between 5 to 7 days after the confinement of adults in treated plants. However, researches using electrical penetration graph (EPG) showed that in plants treated with imidacloprid and thiamethoxam, after the first feeding on phloem, the adults do not do more probing. We carried out the first PCR of the plants in this experiment and the results were negative , in no plants have been detected the presence of the bacterium L. Ca asiaticus. No transmission results yet. We finished the second experiment that was performed to determine if the systemic insecticides are effective until 90 days after application and its effect on transmission of the bacteria. In this experiment, the time to reach 100% of mortality ranged from 3 to 7 days for both systemic insecticides tested (imidacloprid and thiamethoxam). The insecticides were effective up to 90 days after application. The results of PCR carried out for the ACP, in some periods, were positive for 100% of the samples, consisting of 10 insects tested, but in the confinement held at 46 days after application, in any sample was detected the presence of the bacteria. No acquisition in this period. In bioassays performed at 75 and 90 days after application, the percentage of positive samples was 50 to 70% and 10 to 40%, respectively.

We started the experiment 2, and the difference from the experiment 1 is the application of varying doses of the systemic insecticides and confinement of the ACP in plants treated only 7 days after application. To thiamethoxam (Actara 250 WG), the doses tested were: 1, 0.5, 0.1 and 0.05 g/nursery tree and imidacloprid (Provado 200 SC) were: 1.75, 0.9, 0.2 and 0.08 mL/nursery tree. We also started the experiment 3, using different insecticide spraying to determine if they prevent the transmission and for how long.

Using electrical penetration graphs (EPG) techniques, we are studying the probing behavior of ACP. In plants treated with insecticide, the proportion of insects reaching the phloem was similar among plants treated with imidacloprid (0.35 g AI/tree), thiamethoxam (0.25 g AI/tree) and control (untreated plants), being respectively 74, 72 and 76%. The time to perform the first ACP salivation was also similar among treatments, 118.4, 103.2, and 112.6 minutes, respectively. However, the time of phloem ingestion is drastically reduced compared to untreated plants: imidacloprid 6.1, 9.9 and 6.9 min, respectively for 15, 3 5 and 95 days after application (DAA); thiamethoxam 9.6, 14.5 and 17.5 min, respectively for 15, 35 and 95 DAA; Control 14 2.0, 80.3 and 129.0 minutes, respectively for 15, 35 and 95 DAA. Apparently, ACP can only distinguish among plants with and without treatment from the moment that started the ingesting of the phloem sap. In this case, it was observed that after the ingestion of sap with insecticide, the ACP removed the stylet from the plant and rarely returned to start a new probe on the same plant.

In plants sprayed with mineral oil, decreased the percentage of psyllids that could reach the phloem when compared with plants not sprayed, 20 and 70% respectively. However, the few insects that reached the phloem of treated plants carried out long periods of ingestion in this vascular tissue (1 h).