Florida Citrus Advanced Technology Program

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

Instructions Complete the fields based on your project specs. When finished, save the form to your local disk using a unique name. Then, go to **http://research.fcprac.com**, and log in with your user name and password using Researcher Login in the lower left. Find this project title and click on **Submit a Report**. Update your profile information if needed, then upload this report as directed.

2009-2010 REPORT	CATEGORY (drop-down)	TODAY'S DATE (m/d/yr)
○ *Quarterly Report* ◉ *Annual Report* ○ *Final*	Psyllid	3/22/10

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

Ongoing investigations of psyllid host plant interactions to improve psyllid control using cultural practices

TITLE and CONTACT INFORMATION

Proposal Title Effects of nutrition and host plant on biology and behavior of the Asian citrus psyllid and implications for managing psyllid populations

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Organization UF/IFAS/CREC	*Total Direct Funds (current year)* 89,586

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

During the past year, 4 main objectives are being pursued with the goal of better understanding the psyllid/host plant interaction to improve psyllid management using alternative control tactics to broad-spectrum insecticides.

1) Psyllid fitness on various host plants - investigations were initiated to examine the fitness of the Asian citrus psyllid when reared on 8 different citrus varieties. Experiments conducted in both the greenhouse and growth chambers examined psyllid longevity, number of eggs produced, immature survival and development rate for each of these eight varieties examined. During the first set of evaluations, it was found that psyllids were not able to complete development on one of the root stock varieties evaluated, Cleopatra mandarin. Because of the potential significance of this finding, this objective was temporarily set aside to focus more in depth and confirm that Cleopatra mandarin was indeed not a suitable host for the psyllid (see objective 2 below). Work has now resumed on this first objective. Results to date suggest that not all citrus varieties are equally suitable for psyllid development. An electrical penetration graph (EPG) monitor is being used to record psyllid feeding behavior on these 8 host plants to determine if there is a difference in psyllid feeding behavior that can be correlated with difference in psyllid fitness on certain host plants. Preference experiments using an olfactometer are being used to determine if plant volatiles may also be responsible in part for psyllid preference of certain varieties under field conditions.

2) Survival of psyllid on Cleopatra mandarin - based on the preliminary results from objective 1, we conducted a series of replicated experiments to confirm our findings that Cleopatra mandarin is an unsuitable host plant for ACP. Survival of ACP on Cleopatra mandarin was less than 5% compared to greater than 60% survival on sour orange. Female ACP also laid significantly fewer eggs on Cleopatra compared to other host plants. The factors affecting the "unsuitability" of Cleopatra mandarin as a host for psyllid are being further investigated. Working with the CREC plant improvement program (Fred Gmitter), we are conducting evaluations of ACP survival on numerous Cleopatra hybrids in the CREC field collection to determine if any differences in suitability for ACP exiists between these hybrids. Any differences in suitability for ACP will be further examined to determine the responsible factors. Such factors could be exploited in breeding programs for psyllid resistant plants.

3) Effects of host plant nutrition on ACP fitness - the effects of fertilization practices on psyllid population dynamics was examined in greenhouse studies. High levels of nitrogen fertilization resulted in more rapid psyllid development, whereas high levels of potassium significantly slowed down psyllid development. There was also a similar effect for psyllid body mass. Ongoing studies are examining psyllid fecundity and longevity under the varying fertilization regimes. Field trials are planned for 2010 to confirm these findings under typical commercial growing conditions. The goal of this work is to determine if adjusting nutrient applications (within acceptable limits for commercial groves) can be used to help minimize psyllid populations.

4) Effects of boron application on psyllid populations - Based on initial findings from Objective 3 (above), investigations were undertaken to determine the effects of Boron application on ACP populations, particularly adult ACP mortality. Evaluations of differing rates of Boron in both greenhouse and growth chamber experiments demonstrated that Boron alone caused significant mortality of ACP. Filed experiments are underway currently to investigate the use of Boron as an alternative to traditional pesticides for ACP control.