# 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* | Management | 8/9/10 |

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

Enhanced parasitism of psyllids through mass release

**TITLE and CONTACT INFORMATION**

*Proposal Title* Enhanced Biological Control of Asian Citrus Psyllid (ACP) in Florida through Introduction and Mass Rearing of Natural Enemies

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| *Phone* (239) 658 3400 | *Project Duration (years)* 3 *Year of Project* 2 |
| *Organization* SWFREC - IFAS - University of Florida | *Total Direct Funds (current year)* $153,062.00 |

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

Progress to enhance biological control of ACP in Florida is described here by objective number. 1) A total of 24,213, 13,165 and 9,466 Tamarixia radiata were released from colonies at DPI-Gainesville initiated with wasps imported from Pakistan, south China and North Vietnam. Wasps from Pakistan were released at the SWFREC experimental grove and from China and N. Vietnam at two commercial groves, in Glades and Charlotte Counties, respectively, the latter being organic. Releases in commercial groves were integrated with biweekly sprays of horticultural oil. Nymphs recovered on sentinel plants and from grove trees were determined to be mummified or not and reared in the laboratory for adult emergence. Parasitism by T. radiata on sentinel plants in the release block at SWFREC grove averaged 77% and 61% in April and June, respectively, compared to 0-14% and 0-11%, respectively, in blocks where parasitoids were not released. Very few nymphs were recovered on sentinel plants placed at the same locations in July, presumably due to predation, and none were parasitized, although parasitism averaged 31% and 0% among feral nymphs from release and non-release blocks, respectively. Parasitism on sentinel plants placed in five blocks of a neighboring conventional grove averaged 22%, 11%, and 4% in April, June, and July, respectively. No releases of the Pakistani strain were made at this location and parasitoids from previously established strain being reared at SWFREC had been released through March only. Parasitism on sentinel plants placed in oil-sprayed and untreated plots in April averaged 14% and 25%, respectively, at the Glades Co. location and 5% and 15%, respectively, in the organic grove. In Glades Co, 50% parasitism was also observed on sentinel plants placed in a neighboring block where parasitoids were not released. No nymphs were recovered in June from sentinel plants placed in the control plots at either of these two locations. Few were recovered on sentinel plants placed in oil-treated plots and 75% and 28% were parasitized at Glades and Charlotte, respectively. 2) A collaborative study with Dr. Norman Barr, USDA-ARS Mission TX, and others on the genetic characterization of T. radiata from these colonies, as well as from Florida and the Caribbean was completed and published. Further research will be conducted to develop genetic markers for T. radiata to track establishment and performance of different strains in the field. 3) The colony at SWFREC of the previously established strain of T. radiata produced 44,790 wasps between January and July 2010 that were used to help maintain the colony at OrangeCo, conduct laboratory experiments, and release in experimental, organic and conventional groves including the ones mentioned under objective 1. Nymphs collected from an organic grove in Lake Wales in April and June and reared in the laboratory were not parasitized. Releases at this location were made through March only. A collaborative study with CREC entomologists to understand behavioral response T. radiata to volatiles emanating from ACP, citrus and opposite sex conspecifics was recently accepted for publication in the Journal of Insect Behavior. OrangeCo started its own production of T. radiata and through our collaboration initiated a large scale field study to test integration of T. radiata releases into a judicious management program (dormant sprays followed by oil sprays based on scouting) and conventional chemical control for ACP. We also tested an Insta-Clip™ 4-Sided Screen House (13´ x 11´) to cage pruned citrus trees in the field in order to multiply and release T. radiata in large numbers early in the season. About 400 psyllids and 200 Tamarixia adults were released in each cage. Shoot density averaged 28/38.9 dm3/tree with average infestation rate of 56% and 22 nymphs per shoot. Parasitism in the cages averaged 74%. 4) We made several statewide and national presentations and published reports to reach the target clientele in addition to assisting Orange Co. and DPI to establish their mass rearing facilities and start field testing,