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	4/5/10

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

Growing interest and new projects for mass rearing and release of Tamarixia in the public and private sectors.

TITLE and CONTACT INFORMATION

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

Principal Investigator Stansly, P. A	*PI Last Name* Stansly
Email pstansly@ufl.edu	*FDACS Contract Number* 212
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)

Significant progress was made in rearing, release, and evaluation of parasitism rates to enhance biological control of ACP in Florida as described under objective 1) Tamarixia radiata colonies from south China, North Vietnam and Pakistan were established in DPI quarantine and parasitoid releases initiated in October after approval by USDA-APHIS and DPI. So far, 23,571 (S. China), 18,783 (N. Vietnam), and 11,294 (Pakistan) wasps have been released in Zolfo springs, Lake Wales, and Immokalee, respectively. Psyllid populations were low at release sites in Zolfo springs and Lake Wales, and high in Immokalee particularly in a block of 1 m tall citrus plants at the SWFREC. During Oct-Nov, parasitism averaged 10, 2, and 60% at Zolfo springs, Lake Wales, and Immokalee, respectively. We also established an additional colony of the parasitoid Diaphorencyrtus aligarhensis at DPI ,Gainesville, and released 1,325, and 5,750 wasps during 2008 and 2009, respectively, in conventional and organic citrus groves and dooryard Muraya paniculata. A parasitism rate of 6-19% was observed from nymphs reared from M. paniculata in May 2008, although none were recovered in 2009. 2) A collaborative study with Dr. Norman Barr, USDA-ARS Mission TX, and others on the genetic characterization of T. radiata from our 3 new colonies, as well as from Florida and the Caribbean was completed and published. We will continue development of genetic markers for T. radiata to track establishment and performance of different strains in the field. 3) We are consistently improving rearing methods and increasing the production of the previously established strain of T. radiata which we continue to release and evaluate in the field. The colony produced 88,000 wasps between March and December 2009 that were used to initiate and help maintain the colony at OrangeCo, conduct laboratory experiments at SWFREC, Immokalee and CREC, Lake Alfred, and release in experimental, conventional, and organic groves. During Oct-Nov, parasitism averaged 8-50% in release blocks compared to 7-18% in blocks where parasitoids were not released. Parasitism on sentinel plants placed in a conventional grove averaged 60%, 26%, and 27% in Apr 09, Nov 09 and Jan 10, respectively, and 36% and 22% in Nov 09 and Jan 10, respectively, at SWFREC. We also released over 0.5 million predatory mites (Amblyseius swirskii) on mature orange during bloom in an organic grove in Lake Wales, FL. Predatory mites, averaged 3 and 5 individuals per two tap samples per tree in March and April, respectively, and monthly average for psyllid adults was < 1 per tap sample for the year except May when 1.5 per tap sample were observed. 4) We assisted Orange Co. and DPI to establish their mass rearing facilities, made several statewide and national presentations and published our findings to reach the target clientele. Our efforts have generated much interest in the US and Latin America in mass release of T. radiata and the number of projects has mushroomed. For this reason, we organized with the USDA-APHIS and the California Department of Agriculture, the "International Tamarixia Workshop" in Feb 2010 at McAllen TX, with support from sponsors including Florida Citrus Mutual. The objective was to improve the technology by sharing practical information.

1. Barr, N.B., D.G. Hall, A. Weathersbee, R. Nguyen, P. A. Stansly, J. A. Qureshi, and D. Flores. 2009. Comparison of laboratory colonies and field populations of Tamarixia radiata, an ecto-parasitoid of the Asian Citrus Psyllid, using ITS and COI DNA sequences. Journal of Economic Entomology. 102: 2325-2332. 2) Qureshi, J. A., M. E. Rogers, D. G. Hall, and P. A. Stansly. 2009. Incidence of invasive Diaphorina citri (Hemiptera: Psyllidae) and its introduced parasitoid Tamarixia radiata (Hymenoptera: Eulophidae) in Florida citrus. Journal of Economic Entomology. 102: 247-256. 3) Qureshi, J.A., and Stansly P.A. 2009. Exclusion techniques reveal significant biotic mortality suffered by ACP Diaphorina citri (Hemiptera: Psyllidae) populations in Florida citrus. Biological Control 50: 129–136.