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	9/29/09

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

Initial development of attract-and-kill formulations loaded with insecticides and initial field testing of plant volatile attractants

TITLE and CONTACT INFORMATION

Proposal Title Identification of psyllid attractants and development of highly effective trapping and attract-and-kill methods for improved psyllid control

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Organization University of Florida/IFAS	*Total Direct Funds (current year)* 180049

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

The purpose of this proposal is to identify and develop attractants, both pheromone and host-plant based, for the Asian citrus psyllid (ACP). The intent is to develop a highly effective attract-and-kill control system for ACP with such attractants, as well as to develop highly effective monitoring traps to effectively evaluate ACP population densities to better determine the need for spraying. Most recently, we have moved forward with developing an attract-and-kill formulation for ACP with our industry partner and Co-PI Darek Czokajlo. In the past decade, a gel matrix with UV-protective properties was developed as an attracticide for lepidopteran pests. This formulation was registered in Switzerland under the trade name Sirene and subsequently as LastCall in the U.S.A., Europe, and South Africa. The original target pest of this formulation was the codling moth in apples; however, LastCall has been adopted for multiple other pests since then. One of the main goals of this proposal is to develop effective attract-and-kill for ACP by adopting the controlled release gel, termed MalEx, which is the currently licensed name for a formulation similar to LastCall. There is a large precedent for effective attracticides targeting insect pests of agricultural crops, which combine the use of a very low dose of both synthetic attractant (plant volatile or sex pheromone) and insecticide. Such formulations are typically applied as small droplets, which release pheromone at a rate highly attractive to males. Responsive males are thought to follow the plumes from attracticide droplets and obtain a lethal dose of toxicant upon final contact with the source of attractant. Thus, the MaleEx formulation is well suited for this purpose. In our initial research, the MaleEx formulation was loaded with permethrin as the insecticide. However, we learned that it would be difficult to register the formulation for use in Florida citrus with this active ingredient. Thus, our recent investigations have focussed on developing a formulation that is laced with the neonicotinoid insecticide imidacloprid instead of permethrin. We compared formulations containing 6, 14, and 22% imidalcloprid against Asian citrus psyllids in the laboratory. We found the the 14% imidacloprid formulation is superior to the 6% formulation, but that there was no added benefit of the 22% formulation. Thus, we have optimized the dosage of toxicant in the MalEx attract-and-kill formulation for the psyllid using imidacloprid as the insecticide. In seperate trials working on a different attract-and-kill formulation consisting of an emulsified wax formulation (SPLAT, ISCA Technologies), we compared the insecticides Spinosad, Methoxyfenozide and Tebufenozide against the psyllid. We found that Methoxyfenozide and Tebufenozide are not effective with this formulation and that Spinosad is only marginally effective resulting in about 50% mortality. Our ongoing studies are focusing on testing more insecticides with the wax formulation so that more effective psyllid kill can be achieved.

We have continued our work on developing a psyllid attractant in collaboration with both USDA colleagues and our industry partner, Alpha Scents. Most recently, we have conducted four field trapping experiments of synthetic citrus plant volatiles that have been shown to attract psyllids in the laboratory. Our tests to date have been inconsistent. In some cases, the proprietary blend of plant volatiles increase captures of psyllids by 2-3 fold, but in other cases there is no apparent increase in psyllid capture as compared with blank control traps. We are continuing our work on optimizing blends and dosages of currently identified chemicals. We also continue our efforts at identifying further, perhaps more potent attractant chemicals. We are also continuing our research on optimizing trap placement for best psyllid monitoring within groves. This also includes further research on optimizing trap color and design.