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	7/14/10

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

β-amino-butyric acid induces resistance against Asian citrus psyllid in citrus

TITLE and CONTACT INFORMATION

Proposal Title Development and optimization of biorational tactics for Asian citrus psyllid control and decreasing huanglongbing incidence.

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Organization University of Florida-CREC	*Total Direct Funds (current year)* 72114

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

The purpose of this multi-faceted research project has been to develop or uncover biorational alternatives to conventional pesticides for management of Asian citrus psyllid (ACP). One tactic that we have been recently exploring is the use of systemic induced resistance (SAR) against ACP. β-aminobutyric acid (BABA) is known to induce resistance against several microbial pathogens, nematodes and insects in several host plants. The current investigation was undertaken to determine whether BABA would induce resistance against ACP in citrus under greenhouse conditions. We examined the effect of five different concentrations of BABA applied as a root drench to citrus plants, on the performance of ACP. Observations were made on the number of eggs, nymphs and adults produced per plant. In addition, leaf-dip bioassays were performed using similar concentrations of BABA to rule out the possibility of any direct toxic effect of BABA on early nymphal instar (2nd), later nymphal instar (4th) and adults ACP.

The results revealed that BABA-induced resistance in citrus plants can suppress the growth and development of ACP at various growth stages. The total mean (± SEM) number of eggs produced per plant was significantly higher in control plants (97.9 ± 8.8) than in plants treated with 25 (43.5 ± 12.8) and 100 (44.8 ± 14.9) mM of BABA. The total mean number of nymphs produced per plant was significantly higher in control plants (74.0 ± 7.3) than in plants treated with 25 (47.9 ± 10.2), 50 (37.7 ± 7.9) and 100 (364.2 ± 10.4) mM of BABA. Likewise, the mean number of males and females was significantly higher on control plants (male: 4.7 ± 1.3; female: 5.6 ± 1.1) than on plants treated with 25 (male: 3.2 ± 1.0; female: 2.7 ± 0.9), 50 (male: 1.5 ± 0.4; female: 1.6 ± 0.5) and 100 (male: 1.2 ± 0.3; female: 1.4 ± 0.7) mM of BABA. The percent mortality of early nymphal instar (2nd), later nymphal instar (4th) and adults of ACP as a result of different BABA concentrations was not significantly different from the percent mortality observed in the control treatment. The above results suggest that the reduced growth and development of ACP on BABA-treated plants is a function of induced resistance in citrus plants, rather than direct toxicity by BABA on various developmental stages of ACP.

The results of the current study suggest that BABA has potential as a SAR treatment for management of ACP that may supplement conventional insecticides. However, the effects of BABA under field conditions and its effect on no-target organisms still require further investigation. In addition, since BABA acts by potentiating a normally under-expressed defense pathway; therefore, genetic tools could be used to trigger such pathways by genetic alteration and possible development of transgenic cultivars.