CITRUS ADVANCED TECHNOLOGY PROGRAM

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

▶ INSTRUCTIONS

(●) *Quarterly Report* ( ) *Annual Report* ( ) *Final*

Required: What is the "headline" for this report (e.g. a one-sentence "newspaper headline" describing what you accomplished)

Establishment of CTV-vectored insecticidal peptides in citrus

Proposal Title

Insecticidal and antimicrobial peptides for management of Asian citrus psyllid

Today's Date	Sponsoring Organization (drop-down)	Category (drop down)
1/27/12	Citrus Research and Development Foundation	Vector Management

REPORT UPDATE (500 words; summarize your accomplishments)

We have proposed to utilize CTV for delivery of four insecticidal peptides into citrus plants for management of the Asian citrus psyllid (ACP), brown citrus aphid (BCA). Recently, we have completed a series of bioassays to assess the effects of two of these putative insecticidal peptides, henceforth referred to as peptides A and B. Using honeydew excretion assays, we determined that exhibited fed less upon plants expressing peptide A compared to control plants. No differences in psyllid feeding were observed between plants expressing peptide and control plants. In a series of choice tests, significantly fewer ACP adults settled on control plants compared plants expressing either peptide A. In contrast, more adults settled on control plants compared to peptide B plants.

Egg, nymph, and total development time were significantly greater when psyllids were reared on plants expressing peptide B compared to control or peptide A plants. Adult psyllid longevity was not significantly affected by the presence of peptide A or B in plants compared with control plants; however, survival of eggs and nymphs decreased significantly when reared on peptide B plants compared to peptide A and control plants.

Survival and development time of BCA nymphs were not affected by the presence of either peptide compared to control plants, although fecundity and longevity of BCA adults decreased significantly when BCA were reared on peptide B plants. BCA feeding was not affected by the presence of either peptide.

Collectively, these results suggest that peptide B may have insecticidal effects on both ACP and BCA. Currently we continue to conduct bioassays with ACP and BCA using an artificial feeding system containing synthetic peptide B to determine the most effective concentration of this compound against BCA and ACP. Concurrently, we are making progress toward the development of an ELISA assay that will allow us to measure the concentration of peptide B expressed by CTV-transformed plants. Once the most efficacious peptide concentration has been determine, we will manipulate the position of the peptide gene within the CTV vector to optimize the concentration of peptide expressed in plants.

Finally, the genes for the two remaining peptides have been successfully sequenced and cloned into CTV-vectors and bark flap inoculated into plants. Plants containing CTV-peptide C constructs have tested positive for CTV and used to graft-inoculate citrus plants for use in insect bioassays. We expect that the plants will be ready for assays in one month.

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Organization University of Florida

Contract Number 427

Project Duration (years) 2 *Year of Project* 1

Total Funds (current year) $69,383.00

SUBMIT REPORT

CITRUS RESEARCH AND DEVELOPMENT FOUNDATION, INC.