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*	HLB Pathology	6/29/09

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

Rapid method of making resistant or tolerant citrus using citrus tristeza virus as an expression vector

TITLE and CONTACT INFORMATION

Proposal Title	Identify and deliver antibacterial peptides and/or proteins for the control of citrus greening (Huanglongbing or HLB)
Principal Investigator William O. Dawson	*PI Last Name* Dawson
Email wodtmv@crec.ifas.ufl.edu	*FDACS Contract Number* 00073292
Phone 863-956-4311 x 1361	*Project Duration (years)* 1 *Year of Project* 1
Organization UF, IFAS, CREC	*Total Direct Funds (current year)* $309,194

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

This is a continuing project to find an interim control measure to allow the citrus industry to survive until resistant or tolerant trees are available. With the loss of trees due to canker eradication and development and the continuing losses to greening, there is a major concern whether sufficient fruit will be produced to keep processing plants open. We are approaching this problem in two ways. First, we are attempting to find products that will control the greening bacterium in citrus trees. We have chosen to focus on antibacterial peptides because they represent one of the few choices available for this time frame. Secondly, we are developing virus vectors based on CTV to express the antibacterial peptides in trees in the field as an interim measure until transgenic trees are available. We think that this approach could be used beginning 2-3 years from now and until probably 15 years from now when resistant trees should be available.

The milestones for this year's research are:
1) Continue to screen peptides for activity against Las in citrus trees using the CTV vector.
We now have built 45 different peptide constructs that are being tested against HLB or citrus canker. We have 5-7 peptides that we think have activity against these bacteria. We also are developing a more natural screening assay using psyllids to infect trees with HLB.
2) Begin high-throughput screening in tobacco against solanaceous liberbacter. (Falk, UC Davis)
The subcontract to UC Davis has not been completed yet. However, Dr. Falk has established colonies of the solanaceous psyllid.
3) Improve CTV-based vector to produce 2-5 peptides and to overcome cross-protection.
We have built several new versions of CTV vector and have shown that two foreign genes can be expressed efficiently at the same time. We are making progress in understanding the process of cross protection to allow development of a CTV vector that will allow subsequent application of antibacterial gene products.
4) Examine survival of peptides in fruit and juice.
We have developed the plants for these assays, but this project is just beginning.
5) Prepare trees for year 2.
As we develop new anti-bacterial or anti-psyllid constructs into the CTV vector, they immediately begin their pathway to citrus trees to be tested for resistance or tolerance to HLB or citrus canker.