

# REPORT



The CRDF has 127 active research projects, most of which are focused on greening. All the research contracts require quarterly, annual and final progress reports. We plan to publish a listing of all annual and final reports once per calendar quarter in order to provide our stakeholders a high level view of the range of research underway. Our first list below contains the annual and final reports received in the last few months. An annual report shows progress for an individual year of a multi-year project. A final report shows results for a project that has been completed during the calendar quarter just finished. The reports include the project title, which tells the reader something about the focus of the research and a “headline” which is how the principal investigator imagines the press might describe the project. Readers can follow the link to read the full report, or go to the web site [www.citrusrdf.org](http://www.citrusrdf.org) to access all progress reports, learn more about the progress on an individual project and find other research reports and projects on a similar topic.

LINK	TITLE	RESEARCHER	HEADLINE
	Agrobacterium-mediated Genetic Transformation of Mature Citrus Tissue	Gloria A Moore	Progress is being made on clean-up and transformation of mature citrus tissue using several approaches.
	A secure site for testing transgenic and conventional citrus for HLB and psyllid resistance	Ed Stover	Transgenic test site has 300 trees planted and will have an additional 1000 transformants by July 1
	Development of Promising New Rootstocks and Scions for Florida Citrus	Kim D. Bowman	Developing New Rootstocks and Scions Resistant to HLB
	Development of transformation systems for mature tissue of Florida varieties, and strategies to improve tree management	Leandro Peña/ Bill Dawson	IVIA has completed the training of the Florida-based manager and developed mature transformation systems for Florida
	Engineering citrus for resistance to Liberibacter and other phloem pathogens	William Gurley	Resistance protein expressed in phloem has little little negative impact on normal growth.
	Comparative epidemiology of citrus huanglongbing (greening) caused by Candidatus Liberibacter asiaticus and Ca. Liberibacter americanus	Renato Beozzo Bas-sanezi	All three proposed experiments have begun and waiting for incubation period.
	Gross and fine structure localization of Liberibacter in citrus psyllid Diaphorina citri organs: elucidating the transmission pathway.	Judith Brown	PCR amplification COI 1450 bp; PCR and qPCR detection of Liberibacter in adults, immatures, eggs; SEM/TEM
	Reduction of bacterial inoculum and vector control as strategies to manage citrus huanglongbing (greening)	Renato Beozzo Bas-sanezi	Only local inoculum removal and vector control is not enough to achieve success on HLB management
	Manipulating SA-mediated defense signaling to stimulate broad-spectrum resistance to HLB and other diseases in citrus	Hua Lu	Analyze defense phenotypes of Arabidopsis expressing citrus SA regulators
	Strategies to minimize growth flushes of mature citrus trees with pruning practices and plant growth regulators to reduce psyllid feeding	Timothy M. Spann	Plant growth regulators reduce vegetative growth of citrus trees and Asian citrus psyllid feeding, reproduction and survival.
	Combating symptom development in fruit from Huanglongbing-infected citrus trees: A sensory, metabolite and physiological approach	Burns, JK	
	Expand Research Plots and Maintain Existing Areas at Mid Florida Citrus Foundation	Ryan Atwood	Maintaining existing research trials at the Mid Florida Citrus Foundation A.H. Krezdorn grove.
	CAN INSECTICIDES AND MINERAL OIL AVOID TRANSMISSION OF Candidatus Liberibacter asiaticus BY Diaphorina citri?	Pedro Takao Yamamoto	Systemic insecticides and mineral oil interferes with the ACP feeding behavior and can prevent the bacteria transmission.

SEE PAGE 2 FOR ADDITIONAL PROJECT INFORMATION

LINK	TITLE	RESEARCHER	HEADLINE
	Control of the Asian citrus psyllid, <i>Diaphornina citri</i> Kuwayama with protease inhibitors and RNAi.	Dov Borovsky	The effect of peptides, Cysteine Protease Inhibitor and dsRNA targeting essential genes on Asian citrus psyllids survival
	Dissecting The Disease Complex of Citrus Huanglongbing in Florida	Y.-P. Duan	
	Cultivation and Identification fo the Causal Agent of Huanglongbing Disease of Citrus	Norman Schaad	Final Report for Project
	Treatment of Citrus Stumps with Herbicides to Minimize Sprout Formation and Determine Greening Status of Citrus Sprouts	Stephen H. Futch	Remedy Ultra is effective in controlling sprout formation when applied to the remaining stump after tree removal
	Advanced control system for variable rate application of fertilizer and pesticide to trees in the presence of greening and canker	Arnold W. Schumann	New variable rate controller is readily adopted & continues to perform reliably in about 70 Florida citrus grove deployments
	Does systemic acquired resistance (SAR) control HLB disease development?	James H. Graham	SAR is under evaluation for HLB control in young citrus trees in Florida and Brazil
	Support for the Southern Gardens Diagnostic Laboratory	Michael S. Irely	Support for the Southern Gardens Diagnostic Laboratory
	Psyllid mediated completion of pathogenicity tests (Koch's postulates) with a pure culture of the associated Huanglongbing causal bacterium	Vern Damsteegt	Use of psyllids provides alternate means of proving pathogenicity of cultivated 'Ca. Liberibacter asiaticus'
	Direct Grower Assistance: Development and Evaluation of Citrus Grower Psyllid Management Programs	Michael E Rogers	
	Citrus Grower Educational Programs and Technical Field Assistance	Stephen H. Futch	Educational programs assist Florida citrus growers and homeowners in greening management
	Efficacy of citrus canker control strategies, leafminer interactions, and bacterial survival.	Tim R. Gottwald	Plots in Brazil to examine canker control strategies and studies in FL ongoing on bacterial survival.
	The importance of lesions of citrus canker on fruit.	Tim R. Gottwald	Fruit infected with canker not a pathway to spread disease results in proposed new federal marketing rule.
	The citrus psyllid transcriptome and time course differential gene expression in Ca. Liberibacter-infected/free whole psyllids and organs	Judith Brown	Six EST libraries constructed, assembled, and data mining underway; FISH optimization
	Epidemiology and disease control of huanglongbing	Tim R. Gottwald	HLB models developed and currently being validated
	Efficacy of interplanting citrus with guava as a control strategy for huanglongbing.	Tim R. Gottwald	Efficacy studies of interplanting citrus with guava as a control strategy for HLB.
	Genomic sequencing to closure of a curated Florida citrus greening strain of Candidatus Liberibacter asiaticus	Dean W. Gabriel	Genomic sequencing of Ca. Liberibacter americanus from Brazil and two circular phage genomes of L.asiaticus.
	Development of transformation techniques for Murraya, to engineer a deadly trap plant	Fred G. Gmitter Jr.	Genetic transformation of Murraya paniculata is an ongoing challenge
	Identification and Characterization of HLB Survivors	Fred G. Gmitter Jr.	HLB-Free Trees and Orchards Found in China
	International citrus genome consortium (ICGC): Providing tools to address HLB and other challenges	Fred G. Gmitter Jr.	Citrus Genome Sequencing: Full Speed Ahead!
	Development of sensitive non-radioactive and rapid tissue blot diagnostic method for large-scale detection of citrus greening pathogen	Siddaram Gowda	Tissue blot diagnostic method for detection of citrus greening (HLB).
	Efficacy of seasonal insecticide programs for suppressing HLB in new citrus plantings	D. G. Hall	Managing ACP to prevent HLB in newly-planted citrus trees
	Asian citrus psyllid - Sampling, Biological Control, and Seasonal Profile of HLB in Adult Psyllids	D. G. Hall	Stem-tap sampling is preferred over sticky traps for making ACP density estimates
	Pathogen-Vector Relations between Asian Citrus Psyllid and Liberibacter asiaticus	D. G. Hall	Detection of Liberibacter asiaticus in the hemolymph, alimentary canal and salivary glands of the Asian citrus psyllid
	Genetic Resistance to Citrus Canker conferred by the Pepper Bs3 Gene	Diana Horvath	Annual Report - Successful transient resistance to citrus canker
	Evaluation and development of effective ultra low volume spray technologies for management of the Asian citrus psyllid	Masoud Salyani & Lukasz Stelinski	Low volume application is effective in psyllid control

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