



Citrus Research and
Development Foundation, Inc.

Information Summary

CRDF Commitment of FY 2013-14 State Legislative Funding to Research Acceleration

Background

The Florida citrus industry successfully made its case for the need of support from the state of Florida in its battle with HLB, resulting in a legislative research funding commitment for the fiscal year July 1, 2013 through June 30, 2014. This one-year commitment of \$8 million is specifically targeted to accelerate near-term research projects that are advanced sufficiently that they offer some more immediate assistance to the industry. In addition, the funding was designated specifically for Hunaglongbing (HLB) research. In presenting the rationale for this funding request, industry and CRDF representatives made several points that guide the use of these funds:

- The annual CRDF peer-reviewed proposal process is lengthy (7 months) and therefore, cannot be used to obtain a new set of short-term project for funding consideration in a one-year funding cycle. The outcome is that components of the current project portfolio are most appropriate for support.
- Projects being considered by CRDF's Commercial Product Delivery Committee (CPDC) are eligible for funding, and in fact, are supremely positioned for acceleration and enhancement support. As reported below, many CPDC projects are being advanced through the planning and commitment of funds from the Legislative Initiative, and transition from research to delivery has been fostered.
- It was communicated that, although the Legislative commitment is significant, the investment of this funding in 12 months of research is unlikely to bring about significant closure on research to delivery of a final solution or product, and therefore, the case was made for incremental funding to enhance and accelerate ongoing efforts.
- Appropriate milestones and reporting requirements were discussed and are a part of the contracting that supports CRDF research projects.
- It was made clear at all stages of preparing for commitment of this funding that it must be expended during the fiscal year 2013-14, and no extension or carry-over provisions are available. Thus, unspent balances will be reconciled at year end on June 30. It is our goal to commit and spend the total commitment from the Florida Legislature.

Process

Planning that accompanied the request of the State Legislature included preliminary review of the CRDF research project portfolio, and identified projects that might qualify for one-year enhancement funding. The overview of these projects was provided during discussion with legislative and administrative representatives. Following approval of the funding, this portfolio review was repeated and updated, leading to a list of possible projects to be supported. These projects were reviewed internally and submitted for



consideration by CRDF's Research Management Committee (RMC), whose recommendation was forwarded and approved by the Board at its July, 2013 meeting.

Once this step was completed, CRDF reached out to investigators to solicit their ideas on how to accelerate their research further, and requested revisions and enhanced budget details. These plans also were submitted for review by RMC and approval by the Board of Directors in August and September, 2013. Details for these projects are provided below.

The Commercial Product Delivery effort to identify projects that could be enhanced with this funding followed a similar path, with project investigators being requested to forward ideas on how their projects could move forward to field use more quickly. In addition, several meetings of the CPD program managers with interested parties, advisory groups, and the investigators brought forward plans and funding requests that were recommended forward for approval by the Board. These are detailed in the attached table. In some cases, new projects or participants were recruited during the CPD considerations to accelerate development of tools for HLB. These were brought forward for approval by the Board.

Once approved, contract amendments were prepared, but in most cases, ancillary 12-month contracts were executed to separate the scope and budget commitments for this state Legislative funding. This also allows for separate progress reports to be submitted, detailing the specific accomplishments associated with the funding.

Outcome

Attached is a table which summarizes the projects approved for funding through the FY 2013-14 State Legislative Initiative. The table contains individual research and commercial product delivery projects that have been funded through the legislative funding, and projects which are funded to support expanded scope and with additional budgets.

Plan forward for evaluation and reporting

With the majority of funding committed and projects underway, CRDF will follow progress through required progress reports, presentations to committees and the Board, and presentation at citrus grower educational events and meetings. Topic-specific updates will be provided to keep citrus growers informed of progress.

Harold Browning, COO, October 4, 2013



CRDF RESEARCH AGREEMENTS AND ENHANCEMENTS ALLOCATED FOR LEGISLATIVE FUNDING IN FY 2013-2014

Project #	PI	Affiliation	Project Title	Category	End Date	FY 2013-14 Base Funding	FY 2013-14 Enhancement Funding
503	England	Mid FL Citrus Fdn	The support of Citrus Research and Extension efforts by maintaining and improving the Mid Florida Citrus Foundation	1	9/30/2015	\$ 50,000	
532	Folimonova	UF	A novel method for efficient inoculation of trees with the HLB bacterium	2	6/30/2014	\$ 71,194	\$ 15,642
767	Triplett	UF	Rapid identification of antibiotics useful in the control of citrus greening disease	2	4/30/2016	\$ 131,711	
179	Rouse	UF	Cultural Practices to Prolong Productive Life of HLB Infected Trees and Evaluation of Systemic Acquired Resistance inducers	3	6/30/2014	\$ -	\$ 252,196.00
423	Lee	UF	Sensing system for symptomatic citrus greening infected leaves using polarized light	3	1/31/2014	\$ 11,228.75	
517	Dawson	UF	Determine the time and location of sources of HLB inoculum of trees after visit of infected psyllids	3	6/30/2014	\$ 34,433	
707	Brodersen	UF	Are there declines in hydraulic conductivity and drought tolerance associated with HLB?	3	3/31/2015	\$ 115,586	
710	Brodersen	UF	Identification of potential pathways for the spread of HLB through citrus vascular systems	3	3/31/2015	\$ 32,894	
732	Graham	UF	Understanding and reducing early root loss in HLB affected trees	3	3/31/2016	\$ 110,061	
562	Lee	USDA-ARS	Development of new technologies to eliminate huanglongbing from budwood source trees	4	3/31/2014	\$ 67,500	
589	Roberts	UF	Continuation of diagnostic service for growers for detection of Huanglongbing in citrus and psyllids to aid in management decisions	4	6/30/2015	\$ 93,467	
417	Graham	UF	Novel formulations and application methods for bactericides to control systemic HLB infection	5	6/30/2014	\$ 46,881.75	\$ 19,713.00
446	Rogers	UF	Establishment of Citrus Health Management Areas (CHMAs)	5	12/31/2014	\$ 89,675.00	
447	Stansly	UF	Role of Nutritional and Insecticidal Treatments in Mitigation of HLB in New Citrus Plantings	5	2/14/2015	\$ -	\$ 148,159.00
545	Graham	UF	Phytophthora damage to roots: a potential contributor to reduced nutrient uptake and decline of HLB-affected citrus trees	5	6/30/2015	\$ 112,238	
584	Powell	UF	Rapid and Efficient Delivery of Effective Compounds into Citrus Phloem for Treatment of HLB Bacteria	5	5/31/2015	\$ 125,000	\$ 81,610
586	Reyes-Ehsani	UF	Low-cost solar thermal treatment for in-grove reduction of CLas inoculum	5	3/31/2015	\$ 77,951	\$ 229,618
594	Schumann	UF	Improving the uptake efficiency of nutrients applied to citrus foliage	5	6/30/2014	\$ 11,875	\$ 68,641
600	Stansly	UF	Management Tactics Based on Psyllid Movement and Distribution in Florida Citrus	5	5/31/2015	\$ 91,712	
604	Stelinski	UF	Influence of plant nutrient regimes for extending the life of HLB-infected trees on Asian citrus psyllid biology and management	5	3/31/2014	\$ 72,772	\$ 28,368
608	Wang	UF	Characterize the effect of application of beneficial bacteria (Microbe Program) on management of Huanglongbing	5	4/30/2015	\$ 133,286	\$ 97,076
614	Young	UF	Enhanced nutritional application and productivity in endemic HLB grove situations in Florida - a statistical approach to determine efficacy	5	6/30/2014	\$ -	\$ 99,877
702	Baldwin	USDA-ARS-USHRL	Investigate effect of nutritional sprays on healthy and HLB-diseased orange fruit and resulting juice quality	5	4/30/2015	\$ 40,997	
726	Gonzalez	Texas AgriLife	A Bacterial Virus Based Method for Biocontrol of Citrus Canker	5	4/30/2014	\$ 113,507	
731	Graham	UF	Calcium carbonate may reduce root health and exacerbate HLB expression	5	3/31/2016	\$ 65,185	\$ 47,550
773	Wang	UF	Control HLB by developing antimicrobial compounds against Candidatus Liberibacter asiaticus	5	7/31/2016	\$ 101,115	\$ 129,277
413	Folimonova	UF	How the efficiency of HLB transmission by psyllids varies depending on the stage of infection and plant development	6	6/30/2014	\$ 26,785.25	

Project #	PI	Affiliation	Project Title	Category	End Date	FY 2013-14 Base Funding	FY 2013-14 Enhancement Funding
558	Killiny	UF	Disrupt the bacterial growth in the insect vector to block the transmission of Candidatus Liberibacter Asiaticus to citrus, the	6	8/31/2014	\$ -	\$ 40,413
581	Pelz-Stelinski	UF	Key unknowns about Asian citrus psyllid biology in Florida: Overwintering sites and alternative hosts	6	6/30/2014	\$ 100,269	\$ 11,868
582	Pelz-Stelinski	UF	Factors influencing transmission of the huanglongbing (greening) pathogen by the Asian citrus psyllid and methods for interrupting the transmission process	6	6/30/2014	\$ 96,452	\$ 28,368
701	Allan	USDA-ARS	Exploitation of Visual Stimuli for Better Monitoring and Management of ACP in Young Citrus Plantings	6	4/30/2015	\$ 59,468	\$ 70,708
766	Stelinski	UF	Biotic and abiotic factors that cause Asian citrus psyllids to accept hosts: potential implications for young plantings and	6	3/31/2015	\$ 70,936	
425	Morgan	UF	Effect of application rate, tree size and irrigation scheduling on leaf Imidacloprid concentration, psyllid populations and soil leaching.	7	10/31/2013	\$ 24,903.13	
434	Stansly	UF	Mass rearing and release of parasitic wasps to augment biological control of the Asian citrus psyllid (ACP)	7	5/31/2014	\$ 92,438.01	
440	Stelinski	UF	Testing of existing botanical insecticides for activity against Asian citrus psyllid to identify potential new tools for psyllid	7	6/30/2014	\$ 41,309.25	\$ 31,797.00
561	LaPointe	USDA-ARS	Determination of attractive host plant volatiles and sex pheromones of the Asian citrus psyllid using	7	8/31/2014	\$ 78,250	
567	Mankin	USDA-ARS	Acoustic trap for Asian citrus psyllids	7	6/30/2014	\$ 56,100	\$ 115,000
570	Mizell	UF	Using a novel psyllid trap that captures and preserves psyllids and Candidatus bacteria for DNA analyses: understand vector-	7	6/30/2014	\$ 87,321	\$ 97,108
590	Rogers	UF	Enhancing psyllid control through a better understanding of the effects of pesticide applications on psyllid feeding and mortality	7	4/30/2015	\$ 296,567	\$ 45,368
603	Stelinski	UF	Non-neurotoxic chemicals as alternatives to conventional insecticides for Asian citrus psyllid management and prevention	7	6/30/2014	\$ 70,752	\$ 30,336
711	Chougule	Iowa State University	Identification of Bacillus thuringiensis endo-toxins active against Adult Asian Citrus Psyllid	7	4/30/2016	\$ 171,523	
760	Setamou	TAMUK	Development of a novel system for dissemination of a pathogenic fungus to manage Asian citrus psyllid in abandoned citrus groves	7	3/31/2015	\$ 102,840	\$ 43,560
765	Stelinski	UF	Continuation of insecticide resistance monitoring and management for sustainable control of Asian citrus psyllid	7	3/31/2015	\$ 69,005	\$ 22,704
537	Gmitter	UF	Characterization of Huanglongbing (HLB) survivors in the severely infected and/or abandoned groves	10	4/30/2015	\$ 22,874	\$ 20,000
539	Gmitter	UF	Improved Rootstocks and Scions to Overcome HLB and Canker, and for Competitive Market Advantage	10	10/31/2015	\$ 534,329	
615	Gmitter	UF	Evaluation of Rootstocks Appropriate for Higher Density Groves and Advanced Citrus Production Systems Leading to a Sustainable, Profitable Florida Citrus Industry	10	10/31/2015	\$ 51,883	
548	Grosser	UF	Understanding and Manipulating the Interaction of Complex Rootstock Genetics and Constant Nutrition to Enhance the	11	3/31/2015	\$ 106,396	\$ 16,229
728	Gowda	UF	RNAi-mediated gene knock-down of selected members of 'Candidatus Liberibacter asiaticus' induced citrus transcriptome	11	4/30/2015	\$ 54,442	
330	Shatters	USDA-ARS	Targeting the Asian Citrus Psyllid Feeding Mechanism as a Means of Blocking Psyllid Feeding on Citrus.	6	6/30/2014	\$ -	\$ 199,760.00
SUBTOTAL FOR RESEARCH PROJECTS						\$ 4,015,109	\$ 1,990,946

CRDF COMMERCIAL PRODUCT DELIVERY AGREEMENTS AND ENHANCEMENTS ALLOCATED FOR LEGISLATIVE FUNDING IN FY 2013-2014

Project #	PI	Affiliation	Project Title	Category	End Date	FY 2013-14 Base Funding	FY 2013-14 Enhancement Funding
13-01	Powell SA	UF	Services Agreement Antimicrobials	2	6/30/2014	\$ 88,000	\$ 44,000
13-02	Wang SA	UF	Services Agreement Soil Analysis	2	6/30/2014	\$ 44,000	\$ 44,000
617	Powell	UF	Screening effective chemical compounds against citrus HLB bacterium Candidatus Liberibacter--Further evaluation of	2	3/31/2016	\$ 95,872	\$ 94,480
13-06	Triplett	UF	Evaluation of Candidate Microbial Compounds of Combinations of Compounds using the Liberibacter Crescens Assay. for efficacy		6/30/2014	\$ -	\$ 26,040
774-1	Burns	UF	St Helena site improvements		6/30/2014		\$ 91,922
775-1	Nelson	Echelon Biosciences	Investigation of Non-Antibiotic Tetracycline Analogs and Formulations Against HLB		6/30/2014		\$ 116,275
E-02	TBD		Field Trials - 10 Antimicrobials against HLB at 5 sites		6/30/2014		\$ 225,000
E-03	TBD		Field Trials - Controlling HLB & Fruit Drop Using Naturally occurring microbes at 5 sites		6/30/2014		\$ 75,000
E-04	TBD		Field Trials - Multiple low-dose applications of 2-4, D		6/30/2014		\$ 100,000
E-05	TBD		Field Phase - GLP residue study for EPA Registration of		6/30/2014		\$ 300,000
E-06	TBD		Rootstock propagation - seed supply utilization		6/30/14		\$ 110,160
E-07	TBD		Rootstock micro-propagation of in-state liners		6/30/14		\$ 116,640
E-08	TBD		Rootstock Trial Data Collection and Evaluation		6/30/14		\$ 140,000
SUBTOTAL FOR COMMERCIAL PRODUCT DELIVERY						\$ 227,872	\$ 1,483,517
SUBTOTAL FOR ALL PROJECTS						\$ 4,242,981	\$ 3,474,463
TOTAL COMMITMENT AGAINST LEGISLATIVE FUNDING							\$ 7,717,444