



# 2024 PROGRAM



**MARCH 26-29, 2024**  
RIVERSIDE CONVENTION CENTER  
RIVERSIDE, CALIFORNIA, USA

[WWW.IRCHLB.COM](http://WWW.IRCHLB.COM)



# BIOGOLD

The Variety Network®



**Ruby Seedless  
Valencia**



**Texas Red  
Grapefruit**



**Leanri  
Midseason**



**Kirkwood Red  
Navel**



**Pink Lemon**

**Contact Shawn Davis for more information on these or our other varieties, including our upcoming early clementines and late mandarins.**

**661-809-4865 or [sdavis@biogold-na.com](mailto:sdavis@biogold-na.com)**



**Our DNA is innovation for high-yield farming.**





## WELCOME

The Steering and Program Committees welcome you to the seventh International Research Conference on Huanglongbing (IRCHLB VII). It is with great pleasure to welcome you once again to the Riverside Convention Center in the City of Riverside, California, USA.

It is difficult to believe it has been five years (2019) since we last met! The world came to an unfortunate halt in 2020 due to the COVID pandemic, but Huanglongbing (HLB) and the Asian citrus psyllid (ACP) marched on, devastating production citrus throughout the world. All the while, scientists were prohibited or extremely curtailed from continuing their research work in their laboratories, greenhouses and in their field plots. Now that the world shutdown is behind us, we are looking forward to the oral presentations and posters reporting on recent research developments that can move us toward viable solutions and appropriate management strategies. The global citrus industry remains in desperate need of practical solutions which can overcome and/or prevent the destruction of an economically profitable industry.

The Steering Committee is excited to share the conference theme, **“Transitioning research to field reality,”** which was inspired by recent history. Since the detection of HLB-affected trees in 2008 in Florida, citrus production in that state has decreased 80% according to the USDA Citrus Statistics Report. To fight the battle, nearly one billion dollars from federal, state, and industry sources has been invested in research projects to overcome this pathosystem. Much of this research activity was conducted in laboratories and greenhouses; unfortunately, results were not as successful when finally tested in actual farming operations or potential solutions were not economically feasible for commercialization and farming operations. Therefore, to set the tone for the conference, the first session is titled, “Lessons Learned,” and will feature a panel of growers and industry representatives from Florida, California, India, and Brazil, who will discuss the status of their industries; what areas of research and management strategies have been successful in managing HLB and ACP outbreaks; what strategies have NOT worked; and what avenues of new research are still needed. During this conference, the Steering Committee encourages participants to reflect on the needs of growers, and how your research efforts will provide practical solutions and/or the development of management strategies that growers can afford to integrate into their farming operations as soon as possible (within one or two years).



The Program Committee has selected five scientists who have excelled in their fields to give keynote addresses during the breakfast and lunch sessions. Their topics include biotechnological management, decreasing the gap from lab discovery to the grove, new therapies, phloem relations, and adopting unconventional measures where HLB is endemic.

Due to the extended gap in time since the last conference, the Steering and Program Committees felt that several research groups have accomplished more than what could be adequately presented in the traditional “10-minute oral presentation.” As a result, there are four General Sessions in which the speakers will be allowed 25-minutes to give their presentation. No concurrent sessions are scheduled during the General Sessions.

The conference will close with a final panel of international scientists and industry representatives from Australia, Brazil, Latin America, and South Africa that will comment on the status of the citrus industries in their respective countries and provide an outlook on the future of their industries especially in light of the information presented during the conference.

Lastly, the Steering Committee listened to your comments after the last conference in 2019. Fewer organized events have been scheduled in order to provide more opportunities for participants to meet with colleagues and establish new collaborations. Q&A will be done through audience microphones, rather than digitally. The posters will be arranged in groups instead of long rows to facilitate effortless communication with presenters. The program at the Thursday evening banquet will be lighter to allow for increased networking opportunities.

Best wishes for an enjoyable and productive conference in the company of nearly 400 registered delegates from around the world!

**MaryLou Polek**  
**IRCHLB Steering Committee Chair**



# Welcome from the Citrus Research Board

On behalf of the California Citrus Research Board (CRB), it is my pleasure to extend a warm welcome to each of you to the seventh International Research Conference on Huanglongbing (IRCHLB VII) in Riverside, California. This gathering, organized by the CRB with the invaluable support of the California citrus industry and guidance of the joint conference organizing committee, marks a pivotal moment in our collective efforts to combat HLB.

IRCHLB VII serves as a platform for the global community of HLB researchers to convene and exchange insights. As we gather here today, we acknowledge the many advancements made in combating HLB over the past five years since the last IRCHLB was held, yet recognize the persistent challenge it poses to citrus regions worldwide.

While California's commercial groves have thus far not detected HLB, its presence looms in our residential trees. The continuous rise of infected residential trees in the southern regions serve as a reminder of the importance of continued vigilance and innovation. The complete and overwhelming unity within the industry to combat this killer disease does not go unrecognized, and I thank all of you who are part of this effort.

We are privileged to be joined by a diverse array of researchers from around the globe, each bringing unique perspectives and contributions to fight against HLB. During the conference I encourage each of you to engage in the range of presentations and discussions, reflecting on the needs of your region. As a grower, I ask how your research directly benefits growers not only in your area but globally? Another major question I pose is what practical applications or benefits can be implemented from the research you are conducting? These important questions will help us shape our discussions and direct our focus towards actionable solutions that can make a difference in our fight against HLB.

As we embark on this journey together, let us remain steadfast in our commitment to advancing scientific knowledge, empowering growers, and addressing the pressing challenges posed by HLB. I encourage you to delve into sessions that resonate with the needs of your respective regions and explore innovative solutions. I am confident that through collaboration and shared dedication, we will be one step closer to overcoming obstacles presented by HLB.

Thank you for your presence here today, and I look forward to the discussions and collaborations that lie ahead.

**Mark McBroom**  
Chairman, California Citrus Research Board



# Ensuring a sustainable industry

The mission of the Citrus Research Board (CRB) is to ensure a sustainable industry for the benefit of more than 2,700 California citrus growers by prioritizing, investing in and promoting sound science. Since 2008, the CRB has funded more than \$90 million in research projects aimed to trailblaze research opportunities that will keep California's citrus industry competitive and empower growers to improve their individual operations.

Each year, the CRB solicits both new and continuing research proposals in our major research categories:

- New Varieties
- Vectored Diseases
- Production & Post-harvest Technologies
- Pest Management
- Biological Control and Integrated Pest Management
- Citrus Clonal Protection Program (CCPP)

**For additional information about the CRB and our research portfolio, please visit [www.citrusresearch.org](http://www.citrusresearch.org).**





## FUND FOR CITRUS PROTECTION

INTELLIGENCE CENTER IN  
**SCIENCE AND SUSTAINABILITY**

SUPPORTED BY SÃO PAULO **CITRUS GROWERS**  
AND ORANGE JUICE COMPANIES

# LET'S GROW TOGETHER

With over 70 years of history growing citrus, no one knows and grows citrus like us. We operate cutting-edge citrus nurseries and the most advanced packinghouses in the country that can commercialize the newest citrus varieties faster than anyone. We offer expert farm management services that can maximize crop yields and deliver the most competitive returns in the industry. Together, with our global sales and marketing capabilities, we can drive demand, fueling industry-leading results.

To become a Wonderful Citrus grower,  
call 661.720.2500 or visit [wonderfulcitrus.com](http://wonderfulcitrus.com).

## Wonderful citrus™





## GENERAL INFORMATION

### **VENUE:**

Riverside Convention Center  
3637 5th Street, Riverside, CA 92501  
+1 (951) 335-7040

**LANGUAGE:** The official language of the conference is English.

**BADGES:** Name badges must be worn at all times. The QR code on your badge will grant you entry to sessions and meals. Please keep your name badge in clear view during the sessions.

**CONFERENCE ORGANIZERS:** Organizers can be reached at the Registration Center, located on the upper concourse, from 7:00 AM – 5:30 PM, daily.

**INTERNET CONNECTION:** Free WiFi is available throughout the convention center.

**POSTER PRESENTATIONS:** We request that posters are set-up during the following times:

- Tuesday, March 26 between 4:00 PM – 6:00 PM.
- Wednesday, March 27 between 6:30 AM – 7:45 AM and 12:00 PM – 12:30 PM.

Posters should remain in place for the duration of the conference and can be taken down beginning on Thursday, March 28 at 6:30 PM following the conclusion of the second poster session. Any posters remaining after 12:00 PM on Friday, March 29 will be discarded.

**ORAL PRESENTATIONS:** Oral presenters should turn in PowerPoint presentations to the Speaker Check-in Center, located next to the Registration Center on the upper concourse of the Riverside Convention Center. The Speaker Check-in Center will be open beginning Tuesday, March 26 from 4:00 PM to 6:00 PM, and throughout the duration of the conference, daily from 7:00 AM – 5:00 PM.

**JOIN THE CONVERSATION:** Use #IRCHLBVII online to share your conference highlights.





## OFFICIAL CONFERENCE HOTELS



### **Historic Mission Inn Hotel & Spa**

3649 Mission Inn Avenue  
Riverside, California 92501  
+1 (951) 784-0300



### **Marriott at the Convention Center**

3400 Market Street  
Riverside, California 92501  
+1 (951) 784-8000



# AREA MAP WITH HOTELS



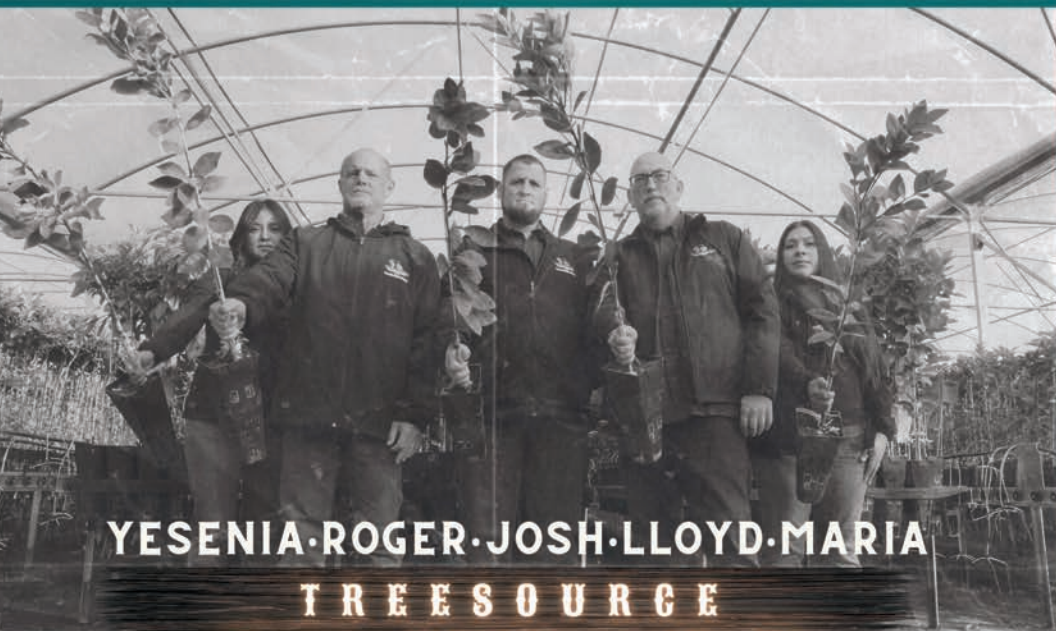
# THE FANTASTIC FIVE



TREESOURCE CITRUS NURSERY



Part of the AC Foods family



YESENIA · ROGER · JOSH · LLOYD · MARIA

TREESOURCE

# 25 YEARS

PLACE YOUR 2025 ORDERS

800.992.2304

[www.citrustreesource.com](http://www.citrustreesource.com)



Citrus Research and  
Development Foundation, Inc.



For fourteen years, CRDF has been at the forefront of funding citrus research in Florida. It has necessarily evolved as an organization as the fight against Huanglongbing (HLB) has become more dire, but it remains the “go to” funding entity for citrus growers to direct where their research dollars are spent. To date, CRDF has:

- Funded 526 projects at a cost of \$215,492,417. Growers have provided much of this funding, but as production declined, grower funding was supplemented by general revenue appropriation from the state legislature and federal grants.
- Funded primarily HLB research, but responds to all Florida citrus research needs.
- Funded over 156 researchers from 55 institutions and businesses in the United States, Australia, Brazil, France, and Spain.

Currently, CRDF’s focus is on maximizing the efficacy of inserting a bactericide into trees since this is possibly the only therapy that has the potential to reset the industry in the short-term; finding replacements for this compound if resistance or phytotoxicity should result; and developing the “tree of the future,” a tree that is sufficiently tolerant or perhaps even resistant, to get the scourge of HLB behind us once and for all.

# INTERNATIONAL RESEARCH CONFERENCE ON HUANGLONGBING VII CONFERENCE AGENDA

## TUESDAY, MARCH 26, 2024

Time	Location	Session	Event	Speaker
4:00 PM	Upper Concourse	Registration	<b>Registration Center Open</b>	
6:00 PM	Courtyard	Reception	<b>IRCHLB Welcome Reception</b>	

## WEDNESDAY, MARCH 27, 2024

Time	Location	Session	Event	Speaker
6:30 AM	Upper Concourse	Registration	<b>Registration Center Open</b>	
6:30 AM	Raincross Ballroom	Meal	<b>Breakfast</b>	
7:45 AM	Raincross Ballroom	Welcome	<b>Welcome</b>	Polek, MaryLou McBroom, Mark Krueger, Robert
8:00 AM	Raincross Ballroom	Keynote	<b>Keynote Address:</b> Biotechnological management of citrus Huanglongbing	Peña, Leandro
9:15 AM	Exhibit Hall A/B	General Session	<b>General Session – Lessons Learned</b> Panel Discussion: Mark McBroom, Bloom to Box Crop Care; Etienne Rabe, Wonderful Citrus; Rick Dantzier, Citrus Research & Development Foundation; Larry Black, Peace River Packing; Renato Bassanezi, Fundecitrus; Dilip Ghosh, Indian Council of Agricultural Research - Central Citrus Research Institute.	Moderated by: Jim Graham
10:15 AM	Upper Concourse	Break	<b>Morning Break</b>	
10:30 AM	Exhibit Hall A/B	01	<b>General Session – Disease Management: Antimicrobial Compounds &amp; Soil Health</b>	Moderated by: Sarah Strauss
		01-1	Identification and evaluation of new chemicals and antimicrobial peptides for HLB management	Mandadi, Kranthi
		01-2	Identification of antimicrobial compounds from the citrus microbiome with potential to manage HLB disease	CamposVieira, Flavia
		01-3	Soil Health: Foundation of Sustainable HLB Disease Management in Citrus Groves	Satpute, Aditi
12:00 PM	Raincross Ballroom	Meal	<b>Lunch</b>	
12:30 PM	Raincross Ballroom	Keynote	<b>Keynote Address:</b> Solving Citrus Greening: Closing the Gap Between the Grove and the Lab	Heck, Michelle



**WEDNESDAY, MARCH 27, 2024 (Continued)**

Time	Location	Session	Event	Speaker
1:30 PM	Exhibit Hall A	O2A	<b>Session 2A – Disease Management: Field Trials</b>	Moderated by: Peggy Mauk
		O2A-1	Field Evaluation of Small Molecules for Citrus Huanglongbing Management in Texas	Ancona, Veronica
		O2A-2	Flipping the HLB therapeutic screening paradigm: That's right we went straight to the field	Larson, Nicholas
		O2A-3	Symbiont™ Technology: development and optimization of a novel delivery approach for therapeutics to control ' <i>Candidatus Liberibacter asiaticus</i> '	Fleites, Laura
		O2A-4	N-acetylcysteine as tool for Huanglongbing management: results in the Brazilian orchards	Picchi, Simone
		O2A-5	Formulated Zinc particles significantly improve HLB-affected tree health	Santra, Swadeshmukul
		O2A-6	Combining individual protective covers and brassinosteroids prolongs young citrus tree health under endemic HLB conditions	Alferez, Fernando
1:30 PM	Exhibit Hall B	O2B	<b>Session 2B – Vector Control: Genome to Field</b>	Moderated by: Andrew Chow
		O2B-1	Proteomic, transcriptomic, and yeast di-hybrid analysis of the ' <i>Ca.</i> ' <i>Liberibacter</i> -psyllid vector pathosystem to dissect pre- and/or acquisition stages of circulative, propagative transmission	Brown, Judith
		O2B-2	Silencing of the most abundant gut surface proteins of Asian citrus psyllid	Xie, Na
		O2B-3	High-throughput Sequencing of Asian citrus psyllid ( <i>Diaphorina citri</i> ) in Distinct Populations and Developmental Stages from Florida	Britt-Ugartemendia, Kellee
		O2B-4	Generation of an optimally attractive scent for Asian Citrus Psyllid (ACP) biocontrol	Aksenov, Alexander
		O2B-5	Low rate of processed kaolin to reduce <i>Diaphorina citri</i> population and huanglongbing incidence in a commercial citrus orchard	Miranda, Marcelo
		O2B-6	Evaluating cover crops as habitat for the natural enemies of Asian citrus psyllid	Patt, Joseph
3:00 PM	Upper Concourse	Break	<b>Afternoon Break</b>	



WEDNESDAY, MARCH 27, 2024 (Continued)				
Time	Location	Session	Event	Speaker
3:15 PM	Exhibit Hall A	03A	<b>Session 3A – Disease Management: Cultural Control</b>	Moderated by: John Chater
		03A-1	High tree density as a cultural strategy for the HLB management at the edge of citrus orchards	deCarvalho, Deived Uilian
		03A-2	Canopy volume, productivity, and huanglongbing incidence on Natal sweet orange grafted onto semi-dwarfing and dwarfing rootstocks at ultra-high density	Girardi, Eduardo
		03A-3	Moderate shading mitigates HLB severity and increases yield	Vincent, Christopher
		03A-4	Vulnerability of citrus to infection by ' <i>Candidatus Liberibacter asiaticus</i> ' is influenced by air temperature and the developmental stage of new shoots	Lopes, Silvio
		03A-5	Texas CRaFT: Mitigating the Effects of Citrus HLB in Texas Through Large-Scale Field Trials	Laughlin, David
		03A-6	HLB management at Cambuhy Agricola in Brazil: lower incidence in endemic region	Lanza, Fabricio
3:15 PM	Exhibit Hall B	03B	<b>Session 3B – Disease Management: Molecular Tools</b>	Moderated by: Nicholas Larson
		03B-1	Specifically Targeted Antimicrobial Peptides (STAMPS) to Control <i>Candidatus Liberibacter</i> Species	Borneman, James
		03B-2	Understanding the citrus pathobiome to mitigate Huanglongbing as a disease complex	Roper, Caroline
		03B-3	High Throughput Culturomics Yields Potential New Tools in the Fight Against Huanglongbing	Drozd, Christopher
		03B-4	Gene expression analysis reveals highly expressed defense response genes associated with HLB sensitivity	Lana, Giuseppe
		03B-5	An effector of ' <i>Candidatus Liberibacter asiaticus</i> ' manipulates SNARE proteins to disrupt autophagosome-vacuole fusion	Wang, Xuefeng
		03B-6	Using Citrus tristeza virus (CTV) to identify citrus targets for CRISPR modification	El Mohtar, Chooa
4:45 PM	Exhibit Hall C/D	Poster Session	<b>Poster Presentation Session</b>	



**THURSDAY, MARCH 28, 2024**

Time	Location	Session	Event	Speaker
6:30 AM	Raincross Ballroom	Meal	<b>Breakfast</b>	
7:30 AM	Raincross Ballroom	Keynote	<b>Keynote Address:</b> A Collaborative Approach to Discovery and Development of New Therapies for Citrus Greening	Manker, Denise
8:30 AM	Exhibit Hall A/B	04	<b>General Session – Breeding for HLB Control</b>	Moderated by: Danelle Seymour
		04-1	New HLB-Tolerant Citrus Rootstocks and the SuperSour Breeding Strategy	Bowman, Kim
		04-2	Citrus Pan-Genome: The Search for Genes of Huanglongbing Resistance in Australian Citrus	Staton, Margaret
		04-3	Combating HLB with Gene Editing	Jacob, Yannick
10:00 AM	Upper Concourse	Break	<b>Morning Break</b>	
10:20 AM	Exhibit Hall A/B	05	<b>General Session – Whole Plant Responses and Management</b>	Moderated by: Robert Krueger
		05-1	Multiple approaches towards Huanglongbing tolerance	Mou, Zhonglin
		05-2	A whole-plant physiological framework for HLB	Vincent, Christopher
		05-3	Citrus Under Protective Screens: A novel tool for managing Asian citrus psyllid-huanglongbing and citrus pest complex	Qureshi, Jawwad
11:50 AM	Raincross Ballroom	Meal	<b>Lunch</b>	
12:30 PM	Raincross Ballroom	Keynote	<b>Keynote Address:</b> Structure Function Relations of the Phloem	Knoblauch, Michael
1:30 PM	Exhibit Hall A	06A	<b>Session 6A – Disease Management: Oxytetracycline-based Approaches</b>	Moderated by: Matthew Mattia
		06A-1	Trunk injection of oxytetracycline improves plant performance and alters the active bark and rhizosphere microbiomes in huanglongbing-affected citrus trees	Strauss, Sarah
		06A-2	Needle-based, automated trunk injection system for HLB-affected citrus trees	Batuman, Ozgur



**THURSDAY, MARCH 28, 2024 (Continued)**

Time	Location	Session	Event	Speaker
		06A-3	Using antisense oligonucleotides and oxytetracycline trunk injections to reduce ' <i>Candidatus Liberibacter asiaticus</i> ' titers in citrus trees, acquisition, and transmission by <i>Diaphorina citri</i> Kuwayama (Hemiptera: Liviidae)	Roldan, Erik
		06A-4	Citrus root mass response of oxytetracycline-injected trees in Florida	Graham, Jim
1:30 PM	Exhibit Hall B	06B	<b>Session 6B – Disease Diagnostics, Culturing &amp; Mitigation</b>	Moderated by: Georgios Vidalakis
		06B-1	Optimizing citrus bioindexing protocols that support Huanglongbing research using light manipulation in next-generation indoor farming systems	Comstock, Stacey
		06B-2	Present status of developing diagnostics, molecular characterization and novel management strategies for Huanglongbing (HLB) in India	Ghosh, Dilip
		06B-3	<i>In vitro</i> culture and artificial inoculation of ' <i>Candidatus Liberibacter asiaticus</i> ' (CLas) reveals a long-lasting low titer infection of CLas in citrus plants	Duan, Yongping
		06B-4	CRISPR/Cas9-mediated Editing of <i>DMR6</i> and <i>SWEET1</i> Genes for Resistance to Citrus Canker and Huanglongbing	Deng, Zhanao
2:30 PM	Upper Concourse	Break	<b>Afternoon Break</b>	
2:45 PM	Exhibit Hall A	07A	<b>Session 7A – Host Genomics</b>	Moderated by: Kranthi Mandadi
		07A-1	Finding HLB Tolerance for Commercial Citrus – From Expected and Unexpected Sources	Grosser, Jude
		07A-2	Dissecting the genetic basis of HLB tolerance in large-scale breeding and evaluation trials	Seymour, Danelle
		07A-3	Exploring the Feasibility of Australian Limes to Create Hybrid Rootstocks with HLB tolerance	Dutt, Manjul
		07A-4	Genomics-abled breeding for Huanglongbing tolerance in citrus	Tapia, Ronald



THURSDAY, MARCH 28, 2024 (Continued)				
Time	Location	Session	Event	Speaker
		07A-5	Genome-assisted breeding to incorporate huanglongbing resistance in citrus	Ramadugu, Chandrika
		07A-6	Genome-wide association study identifies loci and candidate genes for HLB sensitivity in mandarin hybrids	Yu, Qibin
2:45 PM	Exhibit Hall B	07B	<b>Session 7B – Epidemiology</b>	Moderated by: David Morgan
		07B-1	Effectiveness of Asian citrus psyllid management in huanglongbing quarantine zones in residential Southern California	Daugherty, Matt
		07B-2	Temperature-dependent index for ACP population dynamics	Alves, Victor
		07B-3	Incidence of ' <i>Candidatus Liberibacter asiaticus</i> ' in South Texas populations of Asian citrus psyllid and the nymphal parasitoid, <i>Tamarixia radiata</i> , on residential citrus	Chow, Andrew
		07B-4	Optimizing HLB Surveillance in Southern California through Adaptive Risk-Based Surveys	Luo, Weiqi
		07B-5	Invasion and spread of Asian citrus psyllids and HLB in Florida	Halbert, Susan
		07B-6	Optimization of early qPCR detection of ' <i>Ca. Liberibacter asiaticus</i> ' in Asian citrus psyllid sentinels and snapshots of pathosystem dynamics	Ponvert, Nathaniel
4:15 PM	Exhibit Hall C/D	Poster Session	<b>Poster Presentation Session</b>	
6:30 PM	Raincross Ballroom	Meal	<b>IRCHLB VII Banquet</b>	



FRIDAY, MARCH 29, 2024				
Time	Location	Session	Event	Speaker
6:30 AM	Raincross Ballroom	Meal	<b>Breakfast</b>	
7:30 AM	Raincross Ballroom	Keynote	<b>Keynote Address:</b> State of Emergency – Adopting unconventional measures to maintain commercial citrus production under HLB-endemic conditions	Albrecht, Ute
8:30 AM	Exhibit Hall A/B	08	<b>General Session – Host-Pathogen Interactions</b>	Moderated by: Joey Mayorquin
		08-1	' <i>Candidatus Liberibacter asiaticus</i> '-phloem interactions in susceptible and tolerant varieties	Levy, Amit
		08-2	Engineering citrus disease resistance via transgene-free CRISPR genome editing	Wang, Nian
		08-3	Transcriptional regulator inhibitors of <i>Candidatus Liberibacter</i> spp. as potential therapies for HLB	Ramasamy, Manikandan
10:00 AM	Upper Concourse	Break	<b>Morning Break</b>	
10:15 AM	Exhibit Hall A/B	09	<b>General Session – International Perspectives</b>	Moderated by: Leandro Peña
		09-1	Best foot forward: Australian efforts to stay in front of HLB	Donovan, Nerida
		09-2	Living with African Greening	Maree, Hano
		09-3	Economic analysis update of orange groves in the State of Sao Paulo under the impact of the Huanglongbing  Forecasting the Impact of Greening Disease on Orange Acreage and Production in Brazil	Tozatti, Gilberto
		09-4	Tailoring the Silver Bullet: Holistic Management to Overcome Endemic HLB in Jamaica	Delgado Fernández, Juan Francisco
11:45 AM	Exhibit Hall A/B	Session	<b>Conference Closing</b>	Polek, MaryLou McBroom, Mark

Florida Citrus  
*Planting* TODAY  
FOR THE  
*Promise* OF TOMORROW



With more than 10,000 acres of new plantings and nearly 74,000 additional acres of mature tree trials, the Florida Citrus Research and Field Trial Foundation (CRAFT) is putting research in the hands of growers to identify the best practices to provide high quality citrus in the face of citrus greening. To learn more visit [CRAFTFDN.ORG](http://CRAFTFDN.ORG).



**PERPETUAL**™  
— PEPTIDES —

*Endless Opportunities*™

**Symbiont**™ Technology  
**Plant Cells Reimagined**™

[PerpetualPeptides.com](http://PerpetualPeptides.com)



## KEYNOTE SPEAKER BIOGRAPHIES

### KEYNOTE SPEAKERS – WEDNESDAY, MARCH 27

8:00 AM	Raincross Ballroom	Biotechnological Management of Citrus Huanglongbing
---------	--------------------	---



**Leandro Peña, Ph.D.**, got his Ph.D. in biology/biochemistry at the Universidad Autónoma de Madrid (Spain) in 1992. He is specialized in plant breeding through biotechnology and has over 30 years' experience on work in citrus biotechnology. His current research projects cover pathogen and pest resistance, modulation of tree development, altering terpene metabolism and composition of carotenoids in the fruit to improve nutritional and organoleptic characteristics. Peña has published more than 100 peer-reviewed papers and many book chapters on these topics. Author of 6 international patents. He has participated in numerous evaluation committees of Spanish national and international agencies (in USA, Brazil, Colombia, Argentina, Israel, Sweden, Saudi Arabia, Japan, the EU, etc.). He has been consultant on citrus huanglongbing (HLB) for the Brazilian biotechnology company Alellyx, the National Academy of Sciences USA and the Florida Citrus Production Advisory Board. Currently he is research professor of the Spanish National Research Council (CSIC) at the Institute of Plant Molecular and Cellular Biology (IBMCP) of the CSIC and the Universidad Politécnica de Valencia (UPV), Spain, and is also consulting on citrus biotechnology projects for the Fundo de Defesa da Citricultura (Fundecitrus; Araraquara, Sao Paulo, Brazil) and GCM Citrus (Valencia, Spain).

### KEYNOTE SPEAKERS – WEDNESDAY, MARCH 27

12:30 PM	Raincross Ballroom	Solving Citrus Greening: Closing the Gap Between the Grove and the Lab
----------	--------------------	--



**Michelle Heck, Ph.D.**, is a Lead Scientist and Research Molecular Biologist in the USDA Agricultural Research Service in Ithaca, New York. She has a joint appointment as a Professor in the Plant Pathology and Plant Microbe-Biology Section at Cornell University. She is the ARS co-lead of the Citrus Greening Grand Challenge and directs a project funded by USDA National Institute of Food and Agriculture focused on delivering solutions for citrus greening to the industry. Dr. Heck has over 90 peer reviewed publications and book chapters as well as numerous patents. Her research program focuses on the biology and management of insect vector-borne plant diseases.



## KEYNOTE SPEAKER BIOGRAPHIES

### KEYNOTE SPEAKERS – THURSDAY, MARCH 28

7:30 AM	Raincross Ballroom	A Collaborative Approach to Discovery and Development of New Therapies for Citrus Greening
---------	--------------------	--



**Denise Manker, Ph.D.**, joined Bayer Crop Science with the acquisition of AgraQuest, Inc. in August 2012. She is responsible for advising farmers, distributors and technical crop advisors on best use practices involving biological products in various countries throughout the world. She also manages the USDA NIFA funded Citrus Greening research collaboration between Bayer, University of Florida, Texas A&M, UC Davis and Southern Gardens. She was recently recognized as Bayer’s expert in biologicals and was appointed as a Distinguished Science Fellow. As one of AgraQuest’s founding scientists in 1995, she served in a number of different roles during the growth of the startup biological pesticide company, including head of R&D, oversight of global field trials involving biological products, guiding several key crop strategies and managing numerous industrial collaborations. She is listed as an inventor on 36 issued U.S. patents and numerous foreign patents and is the recipient of the American Chemical Society Western Regional Industrial Innovation Award and the EPA Presidential Green Chemistry Award for development of Serenade. She holds a Ph.D. from Scripps Institution of Oceanography where her research involved identification of novel natural products from marine invertebrates and investigations into their bioactivity and biosynthetic origin and a B.S. degree in Biology from the University of South Florida.

### KEYNOTE SPEAKERS – THURSDAY, MARCH 28

12:30 PM	Raincross Ballroom	Structure Function Relations of the Phloem
----------	--------------------	--



**Michael Knoblauch, Ph.D.**, is the Eastlick Distinguished Professor in Plant Cell Biology and Director of the Franceschi Microscopy and Imaging Center at Washington State University in Pullman. He received his Ph.D. from the Liebig University in Giessen Germany in 2000, was postdoc and group leader at the Fraunhofer institute for Molecular Biology and Applied Ecology, Aachen, Germany and well as at the Institute for Microtechniques in Mainz, Germany. He joined WSU in 2006.



## KEYNOTE SPEAKER BIOGRAPHIES

### KEYNOTE SPEAKERS – FRIDAY, MARCH 29

7:30 AM	Raincross Ballroom	State of Emergency – Adopting unconventional measures to maintain commercial citrus production under HLB-endemic conditions
---------	--------------------	---



**Ute Albrecht, Ph.D.**, is an associate professor at the University of Florida. Ute received her Ph.D. in Biology from the Johannes Gutenberg University in Mainz, Germany. After moving to Florida, she joined the USDA Horticultural Research Laboratory in Fort Pierce as a research associate to work on citrus. In 2016, she joined the University of Florida as a plant physiologist in the Horticultural Sciences Department, stationed at the Southwest Florida Research and Education Center in Immokalee. Her research and extension program focuses on citrus rootstocks and rootstock effects on the scion, and on finding solutions to mitigate the negative impacts of HLB on citrus production. She is also actively engaged in graduate student education and mentoring.

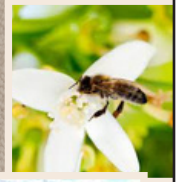


**CANINE  
DETECTION  
SERVICES**

[www.canine-detection.com](http://www.canine-detection.com)

**Locate more  
ACP than traps  
and traditional  
scouting**

*Funded by:  
United States  
Department of  
Agriculture*



**Productivity, quality, sustainability,  
environmental and social responsibility.**

# LOOK OUT, PESTS. MINECTO PRO DOESN'T MISS.

To learn how Minecto Pro can help protect your crops from pests, visit [SyngentaUS.com/MinectoPro](https://www.SyngentaUS.com/MinectoPro)



© 2024 Syngenta. **Important: Always read and follow label instructions. Some products may not be registered for sale or use in all states or counties. Please check with your local extension service to ensure registration status. Minecto Pro is a Restricted Use Pesticide.** Minecto Pro is highly toxic to bees exposed to direct treatment on blooming crops and weeds. Do not apply this product or allow it to drift onto blooming plants while bees are foraging adjacent to the treatment area. Minecto®, the Alliance Frame, the Purpose Icon and the Syngenta logo are trademarks of a Syngenta Group Company.

GS 10122\_1\_1





## IRCHLB POSTER PRESENTATIONS

POSTER PRESENTATIONS		
Poster Number	Title	Presenter
<b>Category 1: Host</b>		
P1-1	A gap-free and haplotype-resolved lemon genome provides insights into flavor synthesis and huanglongbing (HLB) tolerance	Zhang, Muqing
P1-3	Comparative metabolic profiling of fruit juice from Australian limes and <i>Citrus</i> hybrids with <i>Microcitrus</i> parentage	Ramadugu, Chandrika
P1-4	Cultivating Novel <i>Microcitrus</i> Hybrids as Scion for HLB Management in Disease-Endemic Growing Conditions	Nunes da Silva, Larissa
P1-5	Current Knowledge of HLB Tolerance of Citrus Scion Varieties	Kahn, Tracy
P1-6	Different response of <i>PtPAO</i> , <i>CsBiP</i> , and <i>CsICS</i> transgenics sweet orange plants infected by ' <i>Candidatus Liberibacter asiaticus</i> '	Coletta-Filho, Helvecio
P1-7	Embryogenic Citrus Cell Lines for the Generation of Non-Transgenic HLB Resistant/Tolerant Citrus Varieties	Narvaez-Vasquez, Javier
P1-8	Employment of an optimized construct for genome editing in <i>Citrus sinensis</i> aiming to obtain HLB-tolerant plants	Rocha, Dhióvanna Corrêia
P1-9	Harnessing the genetic potential of citrus species to develop new hybrids with enhanced tolerance to Huanglongbing	Dutt, Manjul
P1-10	Increasing Citrus Resistance against Citrus Canker and Huanglongbing through Genome Editing	Deng, Zhanao
P1-11	Mechanisms Underlying Huanglongbing (HLB) Tolerance in the Finger Lime ( <i>Citrus australasica</i> ) and Its Hybrids	Dutt, Manjul
P1-12	N13-32 Hamlin: a seemingly HLB tolerant sweet orange	Chater, John
P1-13	Navigating the Genetic Bottleneck of HLB: Exploring the Genomes of Australian Wild Limes for Development of Disease Resistance	Singh, Khushwant
<b>Category 2: Pathogen</b>		
P2-14	Efficient confirmation test of HLB ' <i>Candidatus Liberibacter asiaticus</i> ' (CLas) with confidence using a sensitive and highly specific quadruplex real-time PCR	Yan, Zonghe
P2-15	Expecting the unexpected: ' <i>Candidatus Liberibacter africanus</i> ' detection using high-throughput sequencing data	Bester, Rachele
P2-18	Microbiomic evaluation of Asian citrus psyllids infected with ' <i>Candidatus Liberibacter asiaticus</i> ' from Mexico	Chen, Jianchi



## IRCHLB POSTER PRESENTATIONS

POSTER PRESENTATIONS		
Poster Number	Title	Presenter
<b>Category 2: Pathogen (Continued)</b>		
P2-19	Molecule polymorphism of G-X-Y interruptions in Collagen Triple Helix protein of ' <i>Candidatus Liberibacter asiaticus</i> '	Ding, Fang
P2-20	Multiplex qPCR detection of <i>Candidatus Liberibacter</i> spp. and <i>Spiroplasma citri</i>	Osman, Fatima
P2-21	Nanometal reagent therapeutics suppress ' <i>Candidatus Liberibacter asiaticus</i> ' the causal pathogen of Huanglongbing	Demirden, Sena
P2-22	Pathogenicity and transcriptomic analyses of two ' <i>Candidatus Liberibacter asiaticus</i> ' strains harboring different types of phages	Zheng, Zheng
<b>Category 3: Vector</b>		
P3-23	ACP Biological Control in California	Morgan, David
P3-24	Bacterial pesticidal proteins Mpp51Aa1 and Tpp78Aa1 are toxic to the Asian citrus psyllid, <i>Diaphorina citri</i>	Dos Santos Tavares, Clebson
P3-25	Biological Control of the Asian Citrus Psyllid, <i>Diaphorina citri</i> , in the Lower Rio Grande Valley of Texas Using the Ectoparasitoid, <i>Tamarixia radiata</i>	Reyes, Mayra
P3-26	' <i>Candidatus Liberibacter asiaticus</i> ' transmission competence and biology of <i>Diaphorina citri</i> modulated by insect specific virus	Kuo, Yen-Wen
P3-27	Cell lines derived from Asian citrus psyllid, <i>Diaphorina citri</i> (Hemiptera: Liviidae)	Wu, Ke
P3-28	Citrus in the Home Landscape	Diepenbrock, Lauren
P3-29	Collection of CA adapted <i>Tamarixia radiata</i> lines to support ACP biological control program.	Pandey, Raju
P3-30	<i>Diaphorina citri</i> and the contribution of natural enemies to its biotic mortality in different high-density citrus plantings	Qureshi, Jawwad
P3-31	Don't shoot the messenger, sterilize it! Can the sterile insect technique provide a pesticide-free alternative for controlling Asian citrus psyllid in California?	Rugman-Jones, Paul
P3-32	Effect of Three Commercial Mycoinsecticides on Asian citrus psyllid Populations in the Lower Rio Grande Valley, Texas USA	Reyes, Mayra
P3-33	Effectiveness of biological control of Asian citrus psyllid from commercial citrus	Qureshi, Jawwad



## IRCHLB POSTER PRESENTATIONS

POSTER PRESENTATIONS		
Poster Number	Title	Presenter
<b>Category 3: Vector (Continued)</b>		
P3-34	Impacts of area-wide treatments of ACP in urban citrus next to commercial citrus in Hemet CA	Simmons, Gregory
P3-36	Performance of metallic blue predatory ladybeetle <i>Curinus coeruleus</i> on Asian citrus psyllid <i>Diaphorina citri</i>	Qureshi, Jawwad
P3-37	Proper identification of psylloids: an important consideration in managing the threat of HLB and its vector	Mauda, Evans
P3-38	Updates on classical biological control of Asian citrus psyllid in Arizona	Henderson, Ruth
P3-39	Utilization of ACP Detector Canines in the desert and coastal regions of California and Arizona improves HLB vector population monitoring and local eradication efforts	Finke, Lisa
<b>Category 4: Host-Pathogen</b>		
P4-40	Analysis of R-genes in Australian Limes in Comparison to Commercial Citrus Cultivars	Liu, Jianyang
P4-41	Analyzing Huanglongbing-Resistant Pummelo from India	Keremane, Manjunath
P4-42	Assessing the Effect of Propidium Monoazide on Sequencing the Viable Endophytic Microbiome in Huanglongbing-affected Citrus	Yang, Chuanyu
P4-43	CRISPR-Cas12a RNP-mediated editing of RBOHD in navel oranges	Zayed, Omar
P4-44	Diffusible Signal Factor (DSF) acts as an elicitor in citrus defense response and increases tolerance to Huanglongbing	de Souza, Alessandra
P4-45	Effects of HLB on citrandarin H-222 as a rootstock for 'Valencia' canopy	Coletta-Filho, Helvecio
P4-46	Effect of rootstocks on fruit quality, yield, incidence, and severity of infection of 'Ca. L. asiaticus' (CLas) in scion varieties of sweet oranges	Cristofani-Yaly, Mariangela
P4-47	Endophytic microbiome in healthy and Huanglongbing-infected citrus plants cultivated in the Central Highlands, Vietnam	Nguyen, Anh Dzung
P4-48	Evaluation of Microcitrus-Derived Hybrids for ACP Colonization and HLB Resistance in Florida	Mattia, Matthew
P4-49	Genetic engineering strategies for HLB resistance/tolerance based on overexpression and gene silencing	de Souza, Alessandra



## IRCHLB POSTER PRESENTATIONS

POSTER PRESENTATIONS		
Poster Number	Title	Presenter
<b>Category 4: Host-Pathogen (Continued)</b>		
P4-50	Informing gene discovery efforts through dissection of gene-regulatory architecture of pathogen susceptibility	Diaz, Isaac
P4-51	Initial Host Response of Sensitive and Tolerant Citrus Varieties to ' <i>Candidatus Liberibacter asiaticus</i> ' (CLas) Transmitted by Asian Citrus Psyllid (ACP)	Wang, Zimmy
P4-52	Members of Sieve Element Occlusion gene family can interact with a complex genetic network on HLB-infected <i>Citrus sinensis</i> plants	Nascimento dos Santos, Lucas
P4-53	Priming commercial citrus cultivars by overexpression of a systemic acquired resistance key regulator confers robust tolerance to Huanglongbing	Sarkar, Poulami
P4-54	Rapid Selection and Evaluation of Citrus Bud-Sports with Resistobiome for HLB Resistance/Tolerance	Duan, Yongping
<b>Category 5: Vector-Host</b>		
<i>All abstracts accepted in this category are included as oral presentations.</i>		
<b>Category 6: Pathogen-Vector</b>		
P6-57	Discovery of nodule-specific cysteine rich peptides that block psyllid acquisition of ' <i>Candidatus Liberibacter asiaticus</i> '	Igwe, David
P6-58	Genome-wide association study reveals genes regulating vector competency of <i>Diaphorina citri</i> , insect vector of Huanglongbing	Stuehler, Douglas
<b>Category 7: Infection Consequences</b>		
P7-59	Co-occurrence analysis of root-associated microbial community members reveals associations with ' <i>Candidatus Liberibacter asiaticus</i> ' infection status	Kunta, Madhurababu
P7-60	Effect of silicon on the quality of juice from orange trees infected with HLB	Creste, Andre
P7-61	Huanglongbing severely impairs yield of marketable fruit of Ponkan mandarin trees grafted onto several rootstock varieties	Stuchi, Eduardo
P7-62	Impact of Huanglongbing (HLB) on Source-Sink Dynamics and Photosynthesis in Citrus	Vincent, Christopher



## IRCHLB POSTER PRESENTATIONS

POSTER PRESENTATIONS		
Poster Number	Title	Presenter
<b>Category 8: Epidemiology and Cultural Control</b>		
P8-63	A new compartment model for HLB dynamics	McRoberts, Neil
P8-64	Alternative Tissue Sampling for Improved Detection of ' <i>Candidatus</i> Liberibacter asiaticus'	Hajeri, Subhas
P8-65	Effect of eradication and maintenance of Huanglongbing-symptomatic trees in the edge strip on disease progress and yield of sweet orange blocks	Bassanezi, Renato
P8-66	Effect of scion–rootstock combinations with contrasting vigor on flush shoot dynamics, natural population of the Asian citrus psyllid, and huanglongbing incidence	Girardi, Eduardo
P8-67	Huanglongbing incidence is influenced by either the scion or the rootstock varieties under the control of the Asian citrus psyllid	Girardi, Eduardo
P8-69	Taking cover – keeping young citrus trees protected from huanglongbing with exclusion netting	Diepenbrock, Lauren
<b>Category 9: Disease Management</b>		
P9-70	A cost-benefit analysis of dwarfed citrus trees in high-density plantings as a mitigation strategy against Huanglongbing economic losses	Lavagi, Valeria
P9-71	A summary of HLB testing in California from 2008 – 2023 by the California Department of Food and Agriculture	Kumagai, Lucita
P9-72	Are new chemical treatments for Huanglongbing cost-effective? Some evidence from Texas	Zapata, Samuel
P9-73	Citrus yellow vein associated virus field evaluation for applications as an anti-pathogenic expression vector	Mitra, Arunabha
P9-74	Combining Individual Protective Covers and Oxytetracycline Injection as an Integrated Strategy for Managing HLB	Tardivo, Caroline
P9-75	Connecting Research to Get Better Huanglongbing Management Results	Dewdney, Megan
P9-76	Copper nanoparticle translocation and accumulation in citrus plants depends on nanoparticle surface charge	Sevcik, Amanda
P9-77	Defending Citrus Orchards: Novel Approaches to HLB and Canker Management Using New Plant Defense Inducers	Batuman, Ozgur



## IRCHLB POSTER PRESENTATIONS

POSTER PRESENTATIONS		
Poster Number	Title	Presenter
<b>Category 9: Disease Management (Continued)</b>		
P9-78	Effects of compost on fibrous root health and physiology of four citrus rootstocks grafted with 'Valencia' orange growing in southwest Florida	Pugina, Gabriel
P9-79	Enhancing the qPCR Detection of HLB: The use of RNA and an internal standard	Blaha, Gregor
P9-80	Evaluating the antibacterial potential of distinct size populations of stabilized zinc nanoparticles for the treatment of Huanglongbing	Stevens, Dinny
P9-81	Expediting the introduction of novel citrus cultivars via alternative temperature manipulation techniques	Omar, Ahmad
P9-82	Exploring the Origins and Future of Citrus with Outreach Videos	Haro von Mogel, Karl
P9-83	GAENTRY technology to enhance Symbiote effectiveness against ' <i>Candidatus Liberibacter asiaticus</i> '	Thomson, James
P9-84	Generating <i>de novo</i> transcriptome assemblies of Australian native lime species using various tissue types and its use as a reference for transcriptome data analysis	Kunta, Madhurababu
P9-86	Improving growth and yield of HLB-infected citrus by Fe application at field experiments in Florida	Suzuki, Motofumi
P9-87	Innovative Strategies for HLB Control: A Multifaceted Approach using CTV Vectors	Simon, Anne
P9-89	Micronutrient therapies for improved citrus production in an endemic HLB era	Kadyampakeni, Davie
P9-90	Mitigation of Huanglongbing: Implications of a biologically-enhanced nutritional program on yield, pathogen localization and host gene expression profiles	Makam, Srinivas
P9-91	New Pathogen Testing Tools for Safe Movement of Citrus Germplasm in the Huanglongbing (HLB) Era	Keremane, Manjunath
P9-92	Nutrition is a Critical Part of the Equation for Maximizing HLB Tolerance	Grosser, Jude
P9-93	Pathogenic Potential of HLB-Associated <i>Fusarium</i> Species	Heimlich-Villalta, Gretchen
P9-94	PGRs for improving hormonal imbalance in HLB affected sweet orange trees	Vashisth, Tripti



## IRCHLB POSTER PRESENTATIONS

POSTER PRESENTATIONS		
Poster Number	Title	Presenter
<b>Category 9: Disease Management (Continued)</b>		
P9-96	The effect of price, practice costs, and risk perception on the decision to adopt ACP and HLB control practices in an established California citrus grove	Kaplan, Jonathan
P9-97	The potential cost-effectiveness of ACP and HLB control strategies in a newly planted California citrus grove	Jewell, Kayla Sunhee
P9-98	The role beliefs in neighbors' behavior and confidence in scientific information play in area-wide coordinated spraying strategies for Asian citrus psyllid, the vector for Huanglongbing	Kaplan, Jonathan
P9-99	Trunk injection of commercial oxytetracycline for HLB management in young Grapefruit trees using a novel injection system	Locatelli, Guilherme
P9-100	Understanding and Engineering Symbiont Physiology with <i>Arabidopsis</i> Cell Identity Lines and Post Transcriptional Gene Silencing	DeBlasio, Stacy
P9-101	Use of engineered Symbiont tissue for the <i>in vitro</i> production of novel therapeutic molecules	Krystel, Joseph
P9-102	Using <i>Citrus tristeza virus</i> (CTV) to identify anti-microbial peptides that limit ' <i>Candidatus Liberibacter asiaticus</i> ' (Clas) replication	El Mohtar, Choa
P9-103	Using <i>Citrus tristeza virus</i> (CTV) to limit ACP survival and reproduction on citrus	El Mohtar, Choa
P9-104	Viroid TsnRNA-IIIb reduces citrus apical shoot growth and overall canopy size. Can it help citrus growers manage HLB?	Lavagi-Craddock, Irene



Next HLB-related conference:

# IOCV XXIII

March 2025

Mildura, Victoria, Australia

[iocv.ucr.edu](http://iocv.ucr.edu)











# Thank You TO OUR SPONSORS

## DIAMOND



Citrus Research and  
Development Foundation, Inc.



## PLATINUM

Wonderful citrus™ Fundecitrus   
SCIENCE AND SUSTAINABILITY  
IN CITRICULTURE



## GOLD



TEXAS CITRUS MUTUAL

Sunkist

## SILVER



## BRONZE



## PATRON

