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## WORKSHOP

### Controlled Environment Agriculture (CEA) for Plant Nursery Production

Join us for the "CEA for Nursery" workshop—a dynamic day dedicated to enhancing nursery production across various crops, with a special focus on citrus, using the latest in Controlled Environment Agriculture (CEA). Designed for growers, nurseries, researchers, and students, this event combines expert insights and hands-on experiences to foster growth, learning, and networking. While the workshop will cover multiple crops, the overarching emphasis will be on citrus, exploring cutting-edge CEA technologies and advancements specific to this vital sector. Don't miss this unique opportunity to delve into the future of nursery production!

To **register** and for **more information on the program**, please visit our website  
<https://www.labtofarm.org/indoor-ag>.



**WEDNESDAY**

MAY 22, 2024



**START AT**

08:00 AM - 17:00 PM



**UCR BARBARA & ARTS CULVER**

3834 MAIN STREET, RIVERSIDE, CA 92501

**UCR CCPP**

4650 14TH ST, RIVERSIDE, CA 92501



## **Morning Session at UCR Barbara & Arts Culver - Light Breakfast and Coffee Break Provided**

**8:30 - 9:30: Karla Garcia (Hort Americas).** Introduction to CEA and Vertical Farming.

*Join Karla Garcia from Hort Americas for an enlightening session on the essentials of Controlled Environment Agriculture (CEA) and Vertical Farming. Discover the advantages of indoor farming systems, including sustainable food production and the critical role of lighting in plant growth. Learn about the design, environmental control, CO2 impact, airflow, and temperature management crucial for vertical farming success. This talk will provide insights into optimizing plant factories with a focus on hydroponic systems and effective farm maintenance. Perfect for those interested in the forefront of agricultural technology.*

**9:30 - 10:15: Erico Mattos (Soli Organic and formerly GLASE).** Advances in CEA Technology, Lighting Controls and Substrates.

*Join Erico Mattos from Soli Organic and formerly GLASE for an insightful talk. Discover the pivotal role of lighting in greenhouse plant growth, the limitations of current systems, and how an adaptive lighting control system can significantly improve efficiency and reduce energy costs. Erico will introduce an energy cost estimator tool and share real-world case studies to highlight practical applications and the benefits of advanced lighting strategies. He'll also discuss the challenges of implementing new technologies and explore various substrates used in Controlled Environment Agriculture. This session is a must-attend for those eager to push the boundaries of CEA with cutting-edge innovations.*

**10:15 - 10:50: Georgios Vidalakis (UCR CCPP).** CCPP Program: Evolution of Citrus Nursery Production.

*Don't miss this opportunity to gain insights into one of the most critical programs supporting citrus agriculture today. Georgios Vidalakis will delve into the transformative journey of citrus nursery production under the Citrus Clonal Protection Program (CCPP) at UCR CCPP. This session will explore the CCPP's pivotal role in safely introducing citrus varieties from around the globe into California for research, improvement, or commercial use. Learn about comprehensive disease testing, innovative therapy methods for disease clean-up, and the rigorous final disease testing processes that ensure the provision of disease-free, true-to-type budwood. Discover the intricate procedures for quarantine release and the establishment of the Foundation Block of Registered Trees, serving as the primary source of budwood. This talk offers a deep dive into the CCPP's efforts to maintain the health and productivity of California's citrus industry, showcasing the evolution of citrus nursery production within the CCPP facilities over the years.*



10:50 - 11:15: Coffee Break

11:15 - 11:50: **Tripp Williamson (Crop Box)**. Shipping Container Crop Box Plant growth systems. *Discover the future of farming with Tripp Williamson's talk on CropBox, an innovative vertical farm housed in refurbished shipping containers. These compact, efficient systems defy traditional agriculture limits, enabling year-round farming and producing up to 12,000 pounds of produce annually in just 320 square feet—mirroring the output of an acre of field lettuce or a substantial greenhouse area. Many other crops can be grown with this system. Learn how CropBox merges sustainability with high yields and scalability, offering a mobile solution to modern agricultural challenges. This session will delve into the benefits of controlled environment agriculture, highlighting how technology, sustainability, and innovative design converge in shipping container farms to ensure food production's future. The conversation will further unfold during an afternoon visit to the Modular Plant Growth Unit (MPGU), showcasing a collaborative design effort with UCR tailored to the unique requirements of citrus nursery production within the CCPP framework.*

11:50 - 12:25: **Pagliaccia Deborah (UCR)**. Citrus Production under CEA: Modular Plant Grow Unit (MPGU) vs. Greenhouse Experience.

*In this session, Pagliaccia will reveal the latest UCR pilot trial results, demonstrating how MPGU can significantly enhance seed germination, the growth of young seedlings, and the rooting of citrus cuttings compared to traditional greenhouse conditions. Pagliaccia will delve into the impact of LED light spectrum on plant development, showcasing how different light qualities influence photosynthesis, plant growth, and development. Attendees will learn about the innovative approaches to manipulating light spectra through LED technology to optimize plant growth, particularly in high-density cultivation systems like vertical farming. This talk is essential for those interested in leveraging cutting-edge technology to address the challenges in citrus nursery production and advance sustainable agriculture practices.*

12:25 - 13:00: **Stacey Comstock (UCR)**. Using Light Manipulation in Next-Generation Indoor Farming Systems: Impact on Citrus Disease Expression and Optimization of Bioindexing Protocols. *Comstock will demonstrate how the MPGU technology can be implemented for the optimization of citrus bioindexing, a required step in the quarantine release program at the Citrus Clonal Protection Program (CCPP). Comstock will share how controlling light wavelengths with adjustable spectrum LED lights influences citrus disease expression, improving disease diagnostics by increasing symptom severity and reducing symptom onset time. Attendees will learn about how differences in light wavelengths can influence the citrus immune system and plant growth, and the effects on disease symptom expression from viral pathogens.*

13:00 - 14:00: Lunch Break (Provided) with Open Discussion/Q&A

### **Afternoon at the UCR CCPP facility for Hands-On Experience at CCPP UCR Facility**

14:00 - 17:00 (Each group will rotate every hour):

#### **Group 1 - MPGU with Trip Williamson, Deborah Pagliaccia, & Stacey Comstock**

*In the afternoon, join Group 1 at the UCR CCPP facility for a hands-on experience led by Trip Williamson, Deborah Pagliaccia, and Stacey Comstock, offering an immersive dive into the shipping container Modular Plant Growth Unit (MPGU) technology made by Crop Box and its applications in nursery production. You will have the opportunity to see and ask questions about environmental controls, CO<sub>2</sub>, airflow, nutrients, temperature management, and more.*

#### **Group 2 - Greenhouse with Georgios Vidalakis, Irene Lavagi-Craddock, and Brandon S McKee**

*Group 2 will join Georgios Vidalakis, Irene Lavagi, and Brandon S McKee in the Greenhouse session, where attendees will be immersed in the critical work of the Citrus Clonal Protection Program (CCPP) at UCR CCPP. This hands-on experience will provide a comprehensive overview of how the CCPP plays a vital role in introducing disease-free citrus varieties to California, employing advanced disease testing and clean-up therapies, and showcasing the development of the Foundation Block. Don't miss this insightful exploration into the greenhouse horticultural and phytosanitary practices that ensure the sustainability and advancement of California's citrus agriculture.*

#### **Group 3 - In Vitro Propagation with Paulina Quijia-Lamiña, Adriana Lara-Brigido and German Villalba-Salazar.**

*Group 3 will have the opportunity to explore the nuances of In Vitro Propagation and Seeds Germination with Paulina Quijia-Lamina and German Villalba-Salazar during the afternoon session at the UCR CCPP facility. This hands-on experience promises to delve deep into the techniques and processes behind successful in vitro cultivation and germination, crucial for the advancement and sustainability of citrus production.*

This workshop promises an engaging day filled with expert insights, the latest advancements in CEA with focus on light technologies, and hands-on experience with cutting-edge plant nursery technologies, with focus on citrus.

If you are interested in attending, please fill out this [FORM](#). Spaces are limited, so secure your spot early! Contact [deborahp@ucr.edu](mailto:deborahp@ucr.edu) if you have further questions.