

# UA-CEAC Winter 2020 Newsletter



Controlled Environment  
Agriculture Center

## 2021 CEAC Greenhouse Crop Production & Engineering Design Short Course- Going Virtual

The University of Arizona's Controlled Environment Agriculture Center's annual Greenhouse Crop Production & Engineering Design Short Course Conference is moving online this year due to the ongoing pandemic. This virtual offering will be held on the dates of **March 3rd, 10th, and 17th from 10am-3pm MST AZ time.**

Topics will include, but are not limited to: Hydroponics, Greenhouse Structures & Design, Environmental Control, Managing Plant Nutrition, Pest Identification and Control, Fertigation Systems, Lighting, Hemp, Mushrooms, Organic Horticulture, and much more!



UA-CEAC's 2021 Online  
Greenhouse Crop Production &  
Engineering Design  
Short Course

Be on the lookout! Registration will be open soon. [Click here](#) for updates.

If you/ your company are interested in being a sponsor or exhibitor for the 2021 Short Course, please email Ellen Worth ([ellenworth@email.arizona.edu](mailto:ellenworth@email.arizona.edu)).

## UA-CEAC's Ph.D. Student, Bekah Waller, Awarded Marshall Foundation Dissertation Fellowship

A big congratulations to UA-CEAC's Ph.D. student, Bekah Waller, for being a recipient of the annual Louise Foucar Marshall Foundation Dissertation Fellowship Award. Bekah was one of six students at the University of Arizona to be selected for this award, which helps Arizona graduate students complete their doctoral dissertation. She was selected based on her topic, methodology, and potential contribution her research will provide. Congratulations, Bekah!



# Ongoing Research

We have had quite a busy semester here at the UA Controlled Environment Agriculture Center. With us teaching mostly online due to the ongoing pandemic, it sure has been an unique experience this semester for us. The following are our ongoing research projects.

## List of Ongoing Research:

- NSF-INFEWS/T2: Saltwater Greenhouse System for Agricultural Drainage Treatment and Food Production (Sponsor- National Science Foundation): contact [Dr. Gene Giacomelli \(PI\)](#)
- NASA STTR Phase II UbiQD-UA, Tailoring the Solar Spectrum for Enhanced Crop Yield for Space Missions (Sponsor- UbiQD): contact [Dr. Gene Giacomelli \(PI\)](#)
- Grapery, Table Grape Production Automation in CEA (Sponsor- Grapery): contact [Dr. Gene Giacomelli \(PI\)](#)
- Expanding Research and Training Programs for Commercial Mushroom Production in Arizona (Sponsor- USDA Specialty Crop Program): contact [Dr. Barry Pryor \(PI\)](#)
- Variation in Virulence Among Yuma Isolates of the Fungus that Cause Fusarium Wilt of Lettuce: contact [Dr. Barry Pryor \(PI\)](#)
- Carbon Nanoparticles on Crop Growth, Yield, Water Use Efficiency (Sponsor- Vulpes Corp): contact: [Dr. Murat Kacira \(PI\)](#)
- Optimizing Indoor Agriculture for Leafy Green Production (OptimIA) (Sponsor- USDA-SCRI): contact [Dr. Murat Kacira \(PI\)](#)
- NSF/NRT-IndigeFEWSS: Indigenous Food, Energy, and Water Security and Sovereignty (Sponsor- National Science Foundation): contact [Dr. Murat Kacira \(PI\)](#)
- Crop Production in Space: Efficient Water/ Nutrient Delivery, Volume Management, and Providing Diet Diversity for the International Space Station (Sponsor- NASA): contact [Dr. Murat Kacira \(PI\)](#)



## Student Spotlights

Click on the links below to see what kind of amazing work our students are doing here at CEAC.



**Charlotte Bonner**

[Click here](#) to read about graduate student Charlotte Bonner as she describes her research in specialty mushroom cultivation.



**Samantha Heward**

[Click here](#) to read about graduate student Samantha Heward as she describes her research in growing tomatoes aquaponically.



**Joe Alcorn**

[Click here](#) to read about graduate student Joe Alcorn as he describes his work with a temperature research study.

# New Students to CEA Programs



**Edmundo (Eddie) Hernandez** joined the Professional Science Masters Program in Applied Biosciences - CEA Track this fall. He graduated from UNC Chapel Hill in 2013 with Majors in Political Science and International Economics, with a Minor in Mathematics. Upon graduating, he worked at a consulting firm covering industrial and agricultural companies and applications before being hired as Director at AgriFacture - a completely indoor vertical mushroom farm in Western North Carolina.

Eddie is interested in building, maintaining, and operating hyper-local indoor, multiple-crop production spaces cultivating plants, fungi, and insects and will be conducting research on quality production of Lion's Mane mushrooms. He is being advised by Dr. Pryor.



**Samuel David Jesse** joins our program as the Ph.D. student in Biosystems Engineering. Samuel hails from a family of fishmongers in Chicago, Illinois, and pursued their B.S. and M.S. in Agricultural and Biological Engineering at the University of Illinois at Urbana-Champaign. There, they researched the treatment of post-hydrothermal liquefaction wastewater for use as a hydroponic fertilizer.

They have started working with Dr. Kacira on a hydroponic system for microgravity environments at the Vertical Farm Lab. They are also interested in the treatment and incorporation of toxic Martian regolith into bioregenerative life-support systems



**Chrisa Whitmore** joins CEAC as a new Ph.D. student. Born and raised in Tucson, AZ, she received a B.S. in Public Health from the U of A. She then received a Masters in Public Health specifying in Environmental Health from State University of New York, University at Albany. As a Ph.D. student here at CEAC she is currently working with Dr. Pryor to develop techniques in cultivating mushrooms.

Chrisa is specifically interested in the medicinal value of mushrooms as well as an additional nutrient source, since mushrooms are items that can be attained to improve the healthfulness of dietary patterns.



**Michael Blum** is a new CEAC Master of Science student in the Department of Biosystems Engineering. Before joining our program, he obtained his BS in Classical Languages (Latin) from U.C. Berkeley. Co-founded an international school and educational non-profit in Jalisco, Mexico and spent six years making it successful. Additionally he has also worked in finance and accounting at data analytics start-up.

Out of the Mars Lunar Greenhouse Lab, he is working alongside of Dr. Giacomelli on a project to study the use of quantum dot films to improve plant biomass production efficiency.



**Jorge Ramos** joins our program after he previously earned his B.S. degree from The University of Arizona in 2015. After graduating, he joined a biotechnology company as a Strain Engineer; where his job was to genetically modify yeast to produce a variety of tetraterpene compounds for industrial applications.

Now, Jorge is obtaining his Master of Science degree in Biosystems Engineering. He currently working on the anaerobic co-digestion of spent-mushroom-substrate (SMS) and horse manure for biogas production with the assistance of Dr. Pryor as his advisor.



**Amy Pierce** joins as a Master of Science student in Biosystems Engineering in the Accelerated Masters Program with CEA emphasis. Originally from Arizona, she obtained her undergraduate degree in Biosystems Engineering from the University of Arizona as well.

As Dr. Kacira serving as her advisor, Amy's research will focus on off-grid greenhouse systems integrated with renewable energy sources for communities challenged with limited access to electrical energy, water, and other resources for food production for a healthy and nutritious diet.

# Where Have We Been in Cyberworld?

**UA-CEAC Hydroponic Tomato Online Intensive Workshop-** Back in November, Dr. Stacy Tollefson hosted UA-CEAC's first ever online offering of her Hydroponic Tomato Online Intensive. Thank you to all of our participants! Be sure to look out for the next session coming soon. [Click here for updates.](#)

**The Space Analog for the Moon and Mars (SAM) at Biosphere 2-** The Space Analog for the Moon and Mars (SAM) held its second annual symposium this year via Zoom. Our graduate student, Michael Blum, spoke about the research UA-CEAC does in furthering the goals of Bioregenerative Life Support Systems. You can watch Michael's presentation by [clicking here.](#)

**2020 Indoor Ag Cafe-** Earlier this month, Dr. Murat Kacira and graduate student, KC Shasteen, presented on "Crop Growth Monitoring and Simulation Based Resource Use Optimization" at the Indoor Ag Cafe/OptimIA Project Webinar. [Click here](#) to see their presentation.

**Agriecture Xchange-** CEAC Director, Dr. Murat Kacira spoke in a panel with others in the CEA industry discussing "Advancing Sustainability in CEA through Technology and Design" at the December 2nd Agriecture Xchange. [Click here to learn more about the conference](#)

**CEAC Covering Environment Seminars-** Follow us for updates about our upcoming seminars and links to recordings to past seminars at <https://ceac.arizona.edu/events/ceac-seminar-series>

## Congratulations, Ohio State University!

Ohio State University announced that their College of Food, Agricultural, and Environmental Sciences will be constructing their new Controlled Environment Food Production Research Complex.

Congratulations to our friends over at Ohio State! We are excited to see the work that comes from the center and wish them continued success!



## Happy Holidays from UA-CEAC

[CLICK TO SEE OUR HOLIDAY VIDEO](#)

Stay Connected with Us!



©2020. UA-CEAC Newsletter is written and produced by Ellen Worth, Gene Giacomelli, and Murat Kacira (editors) with input from the CEAC faculty, staff and students, as part of CEAC outreach. Direct comments or questions to Ellen Worth, Program Coordinator ([ellenworth@email.arizona.edu](mailto:ellenworth@email.arizona.edu)). The Controlled Environment Agriculture Program is a collaboration among UA College of Agriculture and Life Sciences (CALs) Departments, Centers and Institutes. Its programs are supported in part by State funding directed to the Department of Biosystems Engineering, and School of Plant Sciences.

Center Director: Dr. Murat Kacira



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