

Upcoming Events at CEAC in 2014

- >> Intensive hands-on Short Courses for tomatoes and for lettuce: January 5 – 12 <<
>> Annual Greenhouse Short Course: March 23 – 28 <<

LGH-OTM Helps Arizona Steal BIO 2013 Show

Thousands Wanted to Know More About “the Glow”

As many as 15,000 daily visitors, from 48 US states and more than 60 foreign countries, looked up at the glow of lights in the **CEAC Lunar Greenhouse Outreach and Teaching Module (LGH-OTM)** on a platform anchoring the Arizona pavilion during the four days of **Biotechnology International Organization (BIO) Expo 2013** held in Chicago at the McCormick Center from April 22 to 25.

“Arizona stole the show with its pavilion's centerpiece, the LGH-OTM,” says **David Drennon**, vice-president for Strategic Initiatives at with **Arizona Commerce Authority (ACA)**, organizers of the event for Arizona’s 20-plus event partners.



The “Glow” of the LGH-OTM at Bio 2013 in Chicago, standing in front of their exhibit. Pictured (left to right): Dan Mathieson, Gene Giacomelli, Erica Hernandez, Mike Munday, Tyler Stout. Tyler Jensen is not pictured

“The LGH-OTM attracted many of the show's attendees,” Drennon adds, “And that made for access and conversation in economic development for business partners statewide.” The results are that from more than 2,500 pavilion visits, a “dozen qualified leads with strong interest in an Arizona expansion are currently being followed by ACA, and at least 200 additional company inquiries are being closely worked by the ACA team and partners,” said Drennon. Also, there are specific leads inquiring about the work which the LGH-OTM itself represents.

“Quite a few people were interested in the space aspect of the project,” says **Erica Hernandez**, a Space Grant student in plant sciences, one of three U of A students who attended the event to

2013 BIO Convention Article---continued on page 2

The CEAC Hosts another Successful Short Course

Springtime at the Controlled Environment Agriculture means it is time for the annual **greenhouse crop production and engineering design short course**. This year’s course was once again at the beautiful Westward Look resort where the mountainous desert was a great way to welcome people from all over the country. However, once Monday April 8th came, attendees were hard at work listening, learning, and asking the tough questions.

One of the highlights of the lectures at the Westward Look was getting to hear the **Todd and Tricia McPhail** story. The McPhail’s started out by attending the CEAC’s short course years ago and now they own and operate **McPhail Farms** in Lynden, Washington. They specialize in growing mini cucumbers hydroponically alongside beefsteak and cherry [See Short Course Sponsors and Exhibitors Link: <https://ag.arizona.edu/ceac/sites/SponsorExhibitorList>]

Short Course Story---continued on page 3

University Students Meet with Industry Professionals

April 15th, 2013, University of Arizona CEAC students were given the opportunity to network and present themselves to Industry professionals in order to establish connections and consider job opportunities. **The National Greenhouse Manufacturers Association (NGMA)** convened their annual spring meeting at the Omni Tucson National Resort, which allowed NGMA members to come to the CEAC and tour the facilities and then meet with students. The NGMA comprises greenhouse manufacturers from around the country representing numerous companies.



The meet and greet took place in the CEAC classroom, where refreshments were provided and each student had the opportunity to say a few words about themselves to the

NGMA Event Article ---continued on page 3

help explain the LGH-OTM to visitors. “The NASA connection seemed to give it credibility even when they weren’t quite sure what our purpose was, Erica adds.

“However, by far the most discussed aspect of the project was **terrestrial sustainable agriculture**,” Erica says. “People wanted to know why they should care about this project. And the LGH ideas of conservation of water and resources really connected with people,” Erica concludes, referring to discussion about bio-regenerative life support systems, which the LGH program encourages.

Interest in the LGH-OTM was also high with the two major Chicago-area TV news operations interviewing Dr. Gene Giacomelli. [WMAQ Channel 5](#), the NBC News Chicago station; and [Medill News Service](#) of Northwestern University, which provides national wire service for small news outlets and NU alums both aired their stories on BIO 2013 featuring the LGH-OTM as the BIO event’s highlight.

Other sponsors for Arizona at the event were **U of A Tech Parks**, many Arizona cities, and **AZBIO. Hungry Planets and Tech Frontiers Reports**, which cover interactions of science and technology with daily life, supported specific components of the LGH-OTM expedition to Chicago.

“The LGH-OTM helps showcase Arizona and its University Research strengths,” notes ACA’s Drennon. “And BIO itself has plans to prominently feature the LGH-OTM in a show recap and communication over the next year in planning for the 2014 conference in San Diego,” he adds.

“Attending Bio 2013 really allowed me a valuable look at the big picture,” Erica notes. “I was able to see how my work at the Controlled Environment Agriculture Center relates to real world issues and business.”

(by permission from: [Tech Frontiers Reports](#), June 11, 2013)

Dr. Kacira Receives Tenure at the U of A

Congratulations to **Dr. Murat Kacira** for his receiving Tenure at the University of Arizona in the **Agriculture and Biosystems Engineering** Department and for the CEAC!

This is for the culmination of his excellent research work, educational programs and his outreach activities during his

past years at the UA-CEAC. We at the CEAC look forward to many more years of his hard work and dedication.



Dr. Kubota Receives 20-Year Achievement Award



Dr. Chieri Kubota was given the **NCERA-101** 20-year Achievement Award on March 10th at the NCERA-101 meeting at Purdue University. The NCERA-101 is a [USDA Committee on Controlled Environment Technology and Use](#). This is a well-deserved award for someone who has dedicated her life to

controlled environment agriculture research and teaching. Her participation with the NCERA-101 started when she was a research associate at Clemson University in 1994. This award signifies great achievement in her career and we know it is just the start of many successful years to come.

Dr. Rorabaugh Shares her Pest Scouting Expertise

Dr. Pat Rorabaugh was featured in an article on [growingproduce.com](#) where she shared some of her extensive knowledge on pest and disease problems in greenhouses.



Dr. Rorabaugh’s article on pest scouting gave advice on how to diagnose a problem with your crops and ultimately how to solve that problem. A pest or disease problem can quickly turn a beautiful batch of crops into a large headache if the problem is not diagnosed and treated quickly, especially in CEA systems. Don’t learn this the hard way. Be prepared, be proactive and take some tips from the greenhouse growing expert Dr. Rorabaugh.

Growingproduce.com features articles and news relating to 3 different grower magazines, which are part a dozen grower magazines that the parent company Meister Media publishes.

Link to article: [Pest Scouting Pointers for Greenhouse Vegetables](#)

tomatoes in their 14,000 sq. ft. greenhouse. The McPhail's sell their produce to local grocery stores where consumers can't get enough! Short course attendees were inspired by their story and received advice on how to maintain a successful and efficient greenhouse system.

After lectures at the Westward Look concluded, students came to the CEAC for **hands-on workshops**. Attendees enjoyed being able to take what they learned in the classroom and put it into use in the greenhouse. It was also a chance for students to tour the CEAC and see all of the research projects that were in progress. After the workshops, the attendees visited **Dr. Kevin Fitzsimmons' aquaponics greenhouse** for a tour. These onsite experiences were well-received by the students.



Dr. Kevin Fitzsimmons handling a tilapia fish for the students

The short course concluded with a bus ride to Wilcox, AZ to tour **Sunizona Family Farms**. Attendees overwhelmingly loved the scenery and noted that the tour tied together everything that they learned about from the entire week. Sunizona is owned and operated by Byron and Janice Smith, who focus predominantly on tomatoes, micro greens, salad greens and herbs. Sunizona is unique in that it grows its crops not just organically, but "**veganically**," meaning there are no traces of animal products, not even manures for fertilizer. The tour was a great way to end another successful short course!

Special Resource Magazine Issue on Feeding the World

The American Society of Agricultural and Biological Engineers (**ASABE**) published a special issue of Resource Magazine entitled "Controlled Environmental Agriculture, Finding Paths to Feed the World." This special issue featured special guest editors, **Dr. Gene Giacomelli**, as well as CEAC associate and producer/editor of Tech Frontiers Reports, **Michael Munday**. Giacomelli and Munday helped to gather and organize **over 35 writings** from experts around the world on the topic of feeding the world through CEA. The magazine features articles from CEAC founder Dr. Merle Jensen, a UA-CEAC alumnus Jennifer Nelkin-Frymark, and excerpts from the CEAC's Dr. Murat Kacira and Dr. Joel Cuello. The magazine can be viewed in its entirety at the link below:

<http://bt.e-ditionsbyfry.com/publication/?i=148288>

group. Students enjoyed the opportunity to be able to meet with potential employers. It allowed them to get a sense of what industry professionals are looking for in an employee and the various types of jobs that were available, depending on the students' area of study/expertise. NGMA members experienced the CEAC's advanced facilities and then met students that work and study within in these facilities.

It was a great opportunity for companies to meet young faces, see their qualifications first-hand, and then make networking connections that may lead to hiring opportunities. It was a positive event for all and the CEAC looks forward to hosting events like this in the future that help CEAC students enter the industry.

Kubota and Kroggel Receive Grant for Strawberry Production



Dr. Chieri Kubota and Mark Kroggel were recently announced as one of the successful awardees of the [National Strawberry Sustainability Initiative](#) Grant Program, administered by the University of Arkansas with funding from the **Wal-Mart Foundation**. The Kubota team has worked on developing hydroponic

strawberry production using raised troughs for past five years. With this one year grant, they will optimize off-season strawberry production methods suitable in desert southwest and develop information resources for hydroponic strawberry production. The collaborating organizations include Driscoll's, AGC Green-Tech, and UA Maricopa Cooperative Extension.

Professional (Non-Credit) Online Course Reaches Nearly 100 Students Worldwide

Dr. Chieri Kubota offers 'Greenhouse Plant Physiology' course online through the UA Outreach College. This is a 9-week non-credit professional course in which students study the complex eco-physiology of greenhouse crops and its application in greenhouse controlled environment through pre-recorded lectures, Q&A forums, quizzes and online live discussion meetings. The course was offered three times and a total of 95 students took the course from not only the US, but also Mexico, Chile, China, Japan, India, The Netherlands, UK, Qatar, and Australia. The course will be offered again beginning in August (8/5 – 10/6/2013). For more information, visit our website: <http://ag.arizona.edu/ceac/ceac-courses>.

INTERNATIONAL SCHOLARS VISIT CEAC

In the past several years, CEAC has sponsored an international agriculturist to attend the Greenhouse Crop Production and Design short course. The first was from the country of Turkey, then last year from Colombia and this year from Malta.

-Mr. Malcolm Borg, from Malta, is a lecturer in the **Agribusiness Institute at the Malta College of Arts, Science and Technology** in the town of Qormi.

Malta is a southern European country in the Mediterranean Sea, just 50 miles south of Sicily and 207 miles north of Libya. The entire country is smaller than the city of Tucson, covering only 122 square miles with a population of 415,654, making it one of the world's smallest and most densely populated countries. It is a popular holiday destination making tourism the nation's main source of income. Malta has approximately 12,000 part-time and 1300 full-time farmers. Approximately 100 of these are greenhouse farmers.

Malcolm's students are mostly young, aspiring farmers hoping to be greenhouse vegetable growers. While Malcolm was attending the CEAC workshop he was able to **lecture from the CEAC greenhouses via Skype** to one of his classes. The students were extremely excited to have their professor transferring the latest agricultural technologies, in the Maltese language, from the United States. The success of this outreach will surely serve as a blueprint for future transfer of intensive agriculture technologies from CEAC to countries throughout the world.



Malcolm Borg, working in the teaching greenhouse at the CEAC

-Dr. Pablo Delgado Sanchez, a Research Professor of Agronomy Faculty of the Autonomous University of San Luis Potosi (USLP) in Mexico. He recently visited UA-CEAC to attend to Annual Greenhouse Crop Production and Engineering Short Course, and followed by a two-week stay as visiting scholar in Dr. Chieri Kubota's Research lab. Dr. Delgado teaches Plant Physiology, Biotechnology and Plant Propagation and conducts research on Environmental Stress Responses in Plants using Ecophysiological and Molecular Approaches. Dr. Delgado, along with Dr. Federico Villarreal-Guerrero who is also a former graduate of ABE and UA-CEAC, serve as program coordinators in their institutes and are interested in developing collaborative programs between USLP and University of Arizona.

Recent Graduates

- **Polly Juang**, MS, May 2013, Ag & Biosystems Engineering, 'System Dynamics of a Photovoltaic Integrated Greenhouse'
- **Hans Spalholz**, MS, May 2013, Plant Sciences, 'Development of Short Term Storage Techniques for Grafted Vegetable Seedlings'
- **Nick Earls**, BS, May 2013, Ag. Tech. Management. Accepted position as Assistant Hydroponic Grower for Hollandia Produce, Carpinteria, CA



(Left to right): Hans Spalholz, advisor Dr. Kubota; Dr. Kacira, advisor to David Story, and Polly Juang at the Spring 2013 Commencement.

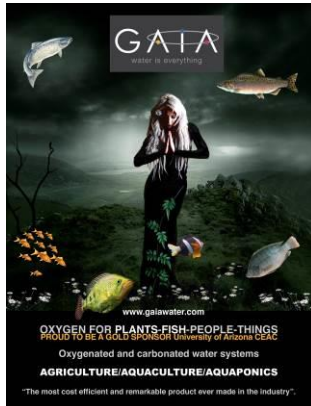
Awards and Recognition

- **Myles Lewis, Arizona Vegetable Company**, was the recipient of the **2013 CEAC Mission Award** given every year at the Short Course for his outstanding leadership and exemplary service to the mission of CEAC, including teaching the **Lettuce Intensive Short Course** each January. Dr. Pat Rorabaugh presents the award.



- Congratulations to UA-CEAC alumnus, **Jennifer Nelkin-Frymark**, for being named to **Greenhouse Product News' "40 industry professionals under the age of 40** who are helping determine the future of the horticulture industry."
Link: <http://www.gpnmag.com/40-under-40>

A Special Thanks to Our 2013 Short Course Sponsors & Exhibitors



Gaia Water LTD
www.gaiawater.com



AGC Chemicals Americas, Inc.
<http://www.agcchem.com>



Energy Biosphere Food
www.ebf-gmbh.de



Wadsworth Control Systems
www.wadsworthcontrols.com



HORT AMERICAS
www.hortamericas.com
Hort Americas, LLC
www.hortamericas.com



Trueleaf Technologies
www.trueleaf.net



Rough Brothers, Inc.
www.roughbros.com



Spectrum Technologies, Inc.
www.specmeters.com



Jiffy Products of America
www.jiffygroup.com



AgraTech Inc.
www.agatech.com



Oasis Grower Solutions
www.oasisgrower.com



AQUATIC ECO-SYSTEMS™

Pentair Aquatic Eco-Systems
www.AquaticEco.com



HortimaX
www.hortimax.com

Students present at 2013 NASA Space Grant Symposium



NASA Space Grant Intern Students **Caitlyn Hall** [back row; 3rd from left], **Erica Hernandez**, and **Mariana Yanes** [front row; 1st & 2nd from left] made oral presentations about their internship research studies at the **2013 NASA Space Grant Statewide Undergraduate Research Symposium** on April 12, 2013. Photo includes Susan Brew (Manager, Arizona/NASA Space Grant Consortium; front row), Dan Wright (Academic Dean, Pima Community College; back row, 2nd from left), Gene Giacomelli (Mentor, back row, 1st from left) and Murat Kacira (Mentor, back row, 1st from right).

New People at the CEAC

Welcome **TJ Johns**, a recent transfer for Pima College into the Agricultural & Biosystems Engineering program with strong interest in CEA. He began experiences with tomato crop production working for Dr. Rorabaugh in the Teaching Greenhouse in May. Best of success in your program, TJ!

Please also welcome student worker **Brandon Phinzy**, who has also been working with Dr. Rorabaugh since May. These students, among others, were a vital part of harvesting all of the crops in the teaching greenhouse and preparing the greenhouse for the next season.

330 Thanks for your Interest in the CEAC!!!

Our doors are always open for visitors and tours, and in the first half of this year, more than 330 people were provided that opportunity! Anyone interested in visiting the CEAC, please email ceac@ag.arizona.edu or call us at (520) 626-9566 and let us know. We appreciate your interest in CEA!

CEAC Quarterly Newsletter by the Controlled Environment Agriculture Center, The University of Arizona, College of Agriculture and Life Sciences.

1951 E. Roger Rd., Tucson AZ 85719 (520) 626-9566 <http://ag.arizona.edu/ceac/>

Written and produced by DRRC-HPSS for CEAC ©2013, CEAC@ag.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 Agricultural & Biosystems Engineering, and Plant Sciences Departments. Center Director: Dr. Gene Giacomelli For more information or to subscribe, email us at ceac@ag.arizona.edu