

Meet the Researchers Part 2

In this second article, we'll highlight the research, extension and teaching programs of Controlled Environment Agriculture (CEA) Assistant Professors hired in 2019 and 2020.

by ROBERTO G. LOPEZ

Dr. Muhammad Shahid received his Ph.D. from a joint-venture program between the University of Agriculture Faisalabad in Pakistan and Cornell University. In 2019, he became a Greenhouse and Nursery Production State Specialist/Extension Associate Professor at the University of New Hampshire in Durham.



Dr. Muhammad Shahid

75% Outreach: As an extension specialist, Muhammad provides growers with research-based recommendations about their specific problems. Additionally, he provides non-formal educational demonstrations on pH measurement, fertilizer injector calibration, efficient and effective irrigation practices, and plant propagation techniques. He views extension not only as a way to interact and educate growers, but also as a way to communicate and educate youth. As such, he gives guest lectures at high schools and undergraduate classrooms to educate them about the greenhouse industry.

25% Research: Muhammad's research is focused on determining how abiotic stresses influence the growth, physiology and biochemical characteristics of greenhouse ornamentals and vegetables, and evaluating germplasm for stress tolerance. His main focus is to improve drought and salt tolerance potential and nutrient use efficiency of greenhouse crops by screening elite germplasm, utilizing exogenous applications of plant hormones and biostimulants,

silicon fertilizers, supersorbent polymers, and biochar-amended substrates. Much of his research is in collaboration with growers as he performs on-farm studies.

Lastly, he's working on silicon nanoparticles, brassinosteroids and plant beneficial microbes to determine their effect on plant physiological, biochemical and molecular attributes, and their association with resilience to different extreme environmental factors.

Hobbies: Traveling to new places, and cooking for family and friends.

Dr. Shuyang Zhen received her Ph.D. in 2017 from the University of Georgia under the advisement of Dr. Marc van Iersel and worked as post-doctoral fellow and research scientist in the Crop Physiology Laboratory at Utah State University from 2017 to 2020. In 2020, she became an Assistant Professor of Controlled Environment Horticulture at Texas A&M University in College Station.



Dr. Shuyang Zhen

65% Research: Shuyang's research focuses on environmental plant physiology and the optimization of specialty food and ornamental crop production in controlled environments. Her research interests include photosynthesis and crop yield, LED lighting, plant nutrition, hydroponics and the selection of crops with improved performance in greenhouses and indoor vertical farms.

35% Teaching: She'll be teaching a graduate course on environmental instrumentation and an undergraduate course in CEA Crop Production Systems.

Hobbies: Hiking and cross-country skiing, and vegetable and flower gardening.

Dr. Qingwu (William) Meng

received his Ph.D. in 2018 from Michigan State University under the advisement of Dr. Erik Runkle. In 2020, he became an Assistant Professor of Controlled Environment Horticulture at The University of Delaware in Newark.



Dr. Qingwu (William) Meng

55% Research: William's research team aims to optimize environmental conditions and address technical bottlenecks in production of specialty food and floriculture crops. Research in his Delaware Indoor Ag Lab (DIAL) explores how environmental stressors and management practices influence crop photosynthesis, yield, shape, flavor and nutritional value. Another emphasis is engineering hydroponic systems to improve nutrient delivery, crop yield and operating efficiency in automated greenhouses and indoor farms. In addition, his greenhouse research focuses on effective and cost-saving lighting strategies to control flowering of ornamental crops.

40% Teaching: He's currently teaching PLSC267: Introduction to Hydroponics and will teach another course on Greenhouse Physiology and Technology.

5% Service: William serves on the departmental Curriculum Committee and Greenhouse Committee, and will advise undergraduate students in the Sustainable Food Systems major.

Hobbies: William likes photography, videography, hiking, traveling and cooking. He also enjoys growing leafy greens, culinary herbs and peppers in his home hydroponic system.

Dr. W. Garrett Owen received his Ph.D. in 2017 from Purdue University under the advisement of Dr. Roberto Lopez. From 2017 to 2020, he was a Floriculture Extension Specialist at Michigan State University.

In 2020, he became an Assistant Professor of Controlled Environment Horticulture at the University of Kentucky in Lexington.

60% Extension: Garrett's extension program seeks to educate growers of all sizes and backgrounds, and train extension agents and associates about CEA production, and best management strategies and practices. To date, his extension efforts focus on nutritional monitoring of greenhouse crops and sharing information through FertDirtandSquirt.com. Furthermore, he's a co-organizer, active contributor and member of the Electronic Growers Resources Online (e-GRO; e-gro.org) team, providing timely production information to growers globally.



Dr. W. Garrett Owen

25% Research: Garrett has developed the Controlled Environment Horticulture (CEH) Lab where his team is investigating food and floriculture crops under protection in soilless culture. This includes production systems, crop culture, management and production use efficiency. Specifically, the food crop research pertains to plant nutrition, production and growth management strategies of "traditional" vine crops and identifying alternative vegetable crops for cultivation under protection.

10% Teaching/5% Service: Garrett teaches one course a year, alternating between Greenhouse and Controlled Environment Management, and Floriculture and Greenhouse Food Crop Production. In each course, students are taught the fundamentals of managing controlled environments, and through experiential learning, are able to apply their knowledge by growing various floriculture and food crops.

Hobbies: Garrett enjoys learning more about photography and practices to strengthen his skills. He has two rescued Australian shepherds, Milo and Lily, that enjoy hikes, walks and time at the dog park. Garrett also has a saltwater aquarium that keeps him engaged in water quality testing and propagating corals to share with fellow hobbyists and promote coral reef conservation.



Dr. Kellie Walters

Dr. Kellie Walters received her Ph.D. in 2020 from Michigan State University under the advisement of Dr. Roberto Lopez. In 2020, she became an Assistant Professor of Controlled Environment Vegetable Physiology at the University of Tennessee in Knoxville.

85% Research: Kellie has created the Controlled Environment Plant Physiology Lab where her research team focuses on food crop physiology, including greenhouse and indoor production systems, spanning from potted culture to hydroponics. The overall goal is to determine how to leverage environmental controls (light intensity, duration and quality, temperature, and CO₂), plant nutrition, and plant growth regulators and hormones to improve production efficiencies, yield and crop quality.

In addition to general physiology and production research, her lab is focusing on in-house analysis of secondary metabolites contributing to crop flavor and nutritional value to improve taste, appearance, overall consumer appeal, and producer profitability and sustainability.

15% Teaching: Kellie teaches one course, PLSC 333: Plant Physiology and Nutrition, an undergraduate course focusing on physiological principles, including photosynthesis and transpiration, respiration, water and hormonal relations, mineral nutrition, plant development, and response to the environment as they relate to landscape design and construction, residential plant management, commercial plant production, agronomic production, and public horticulture. The focus is on how production practices influence plant productivity and quality.

Hobbies: Outside of work, Kellie enjoys cycling through the hills of East Tennessee. She also enjoys hoarding houseplants and going on hikes with her partner, Alex, and dog, Trip.

Please join me in congratulating the next generation of CEA educators, extension specialists and researchers. Remember, the best way to support research that benefits the CEA industry is to make a tax-deductible contribution directly to individual research programs. 📧

ROBERTO LOPEZ is an Associate Professor and Controlled Environment/Floriculture Extension Specialist in the Department of Horticulture at Michigan State University.

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