NEWS UPDATES FROM THE

COLLEGE OF ENGINEERING, SCIENCE, TECHNOLOGY, & AGRICULTURE

Winter/Spring 2020 Volume 1/Issue 1

CESTA students Adam Dabdoub, Rapheal Hewitt, and Aaron Washington show off their winning concept "The Fooderator" with faculty mentor Dr. Marcus Nagle at the ERN conference in Washington DC., February 21-23, 2019.

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CSU wins 1st place in the 2019 HBCU Making & Innovation Showcase

Students from Central State University's College of Engineering, Science, Technology, and Agriculture (CESTA) presented in the category "HBCU Making & Innovation Showcase" (NSF grant HRD-17460430) during the Emerging Researchers National (ERN) Conference in STEM, which took place February 21-23, 2019 in Washington D.C. Through this grant, students and faculty from HBCUs engaged in activities to encourage and support their innovation and entrepreneurship.

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Affirmative Action/Equal Opportunity Institution.

Central State Univerity Leading in Honeybee Research in Ohio

Dr. Hongmei Li-Byarlay, Central State University researcher, and leader of the university's Apiculture Program was featured in the magazine Rural Life Today. Her work at CSU emphasizes the importance of beekeeping and pollination in Ohio and the United States and focuses on sustainable apiculture (technical term for beekeeping), genetics, behavior and physiology of honey bees. Of special importance is her research aimed at increasing the honeybee population. The article provides an in depth view of her work and the research being conducted at Central State. READ FULL ARTICLE AT: https://www.rurallifetoday.com/rural-life-southeast/5044/beekeeping-csu-stresses-pollination-value

CSU Students pictured receiving award at ERN Conference.

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Students, with support from a faculty advisor, created prototypes using hardware and software to address one of the United Nations Sustainable Development Goals. The Making and Innovation Showcase was conceived to promote innovation and making on HBCU campuses and provide a platform to investigate the ways in which they are supported and sustained at institutions. CSU's team was one of 11 groups chosen to participate in the Showcase. The team submitted a concept for a smart hydroponics system to grow fresh vegetables in a repurposed refrigerator. The title of the project is "The FOODerator: a Food Computer Concept for Increased Access to Fresh Produce In Urban Areas." Students received a prize of $1200." Student members were Adam Dabdoub, Rapheal Hewitt and Aaron Washington, all of whom are sophomore Computer Science majors. The faculty mentor was Dr. Marcus Nagle, research assistant and professor of of horticulture at Central State University.

To view the video visit https://youtu.be/_lJik821bss and please be sure to hit "like.

STUDENT SPOTLIGHT

Central State Univerity Students have a unique opportunity to participate in research as undergraduates. Since becoming a land-grant institution, CSU students have been involved in hydroponics and aquaponics research, presented before national audiences, and published alongside their professors. The highlights below are just a small example of the research CESTA students are involved in.

AGRICULTURAL & LIFE SCIENCES

CSU Biology students Kaila Young (left first one) and Xaryn Cleare (4th)presented at the Heartland Apiculture Society Annual Conference in Bowling Green, KY. They are pictured with Dr. Li-Byarlay, Dorothey Mogan, and Dwight Wells, two of CSU's beekeeper partners on the USDA SARE grant project entitled "Improving the Honeybee Queen Qualities and Genetic Diversity by Transferring Selected Queen Cells." Grant#: ONC19-062

KAILA YOUNG
XARYN CLEARE

ENGINEERING, MATHEMATICS & COMPUTER SCIENCE

Cameron Barnes wears many hats at CSU. He is a senior majoring in Business Administration Marketing, serves on the student advisory council, and is an active fraternity member. He works in the College of Engineering, Science, Technology, and Agriculture and is a valued member of the student worker team.

CAMERON BARNES

WATER RESOURCES MANAGEMENT

CSU students receive Honorable Mention in the 2019 Environmental Engineering and Science Foundation and Association of Environmental Engineering and Science Professors -Student Social Media Competition for their social media page designed to educate students and the public about the role of Environmental Engineers and Scientists. Team Members include: Jasmine C. Walker, Marcus Jenkins, Daniel Lee, and Jochannan Mitchell. Faculty Advisor was Ramanitharan Kandiah.

JASMINE WALKER
MARCUS JENKINS
DANIEL LEE
JOCHANNAN MITCHELL

Central State University Collaborates with Nigerian Government to Train Academics and Researchers at Central State University's New Cynthia Jackson-Hammond Institute for Professional Development

The first Capacity Building (CB) workshop took place Feb. 24-28, at CSU's Xenia facility, located at 336 Progress Dr, Xenia, OH 45385.

by Lena Fields-Arnold

CESTA is excited to announce a partnership with the Nigerian government to train academics and researchers.

Over the next four years, academics and researchers from Nigeria seeking to enhance grant writing skills will attend week-long capacity building workshops at Central State University's (CSU) newly established Cynthia Jackson-Hammond Institute for Professional Development.

The Institute, housed within the College of Engineering, Science, Technology, and Agriculture (CESTA), is named after Central State's outgoing president, and will serve as an international leadership and professional development center. Through this collaboration with the Nigerian government, Central State University will officially begin training leaders on a global scale.

"This workshop was organized for Research and Academics in Nigerian Public Universities," said Dr. Ibrahim Katampe, workshop organizer and assistant director of Innovation and Technology Transfer for CESTA at Central State University. "The February event is the first of many that will take place over the course of the next four years and was designed specifically to train academicians in Nigerian Higher Educational Institutions (HEI's) with current knowledge and skill required to write a fundable research proposal that meets international standards." The Tertiary Education Trust Fund (TETFund) was established by the Nigerian government as an intervention agency under the TETFund ACT – Tertiary Education Trust Fund Act, 2011.

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"We are honored to be partners in this global expansion of connectivity."
-Dr. Cynthia Jackson-Hammond

Pictured above-CSU President Dr. Cynthia Jackson-Hammond, Dr. Alton Johnson, and Professor Ibrahim Katampe.

TETFund monies provide for the essential physical infrastructure for teaching and learning, instructional material and equipment, research and publication, academic staff training and development, and any other need that may be deemed critical and/or essential for the improvement of quality and maintenance of standards in the higher educational institutions. Under its mandate of Research and Academic Staff Training and Development, a sub-committee of the TETFund was set up in May 2019.

This committee was tasked with developing a framework for the strengthening and institutionalization of Research and Development in Tertiary Institutions in Nigerian Universities. Co-chaired by Professors Placid Njoku and Tope Togun of Nigeria, along with Dr. Ibrahim Katampe serving as vice-chair, the committee developed a plan and made recommendations to Professor Suleiman Bogoro, Executive Secretary of the TETFund. In June, Professor Bogoro and members of the committee, paid a visit to the U.S. as part of a global assessment of "best practices."

Stops included meetings with officials of the U.S. State Department, the National Science Foundation (NSF), GE Global Research Talent Center in New York, and Central State—an 1890 Land-Grant University. "It was during that visit we began discussing the possibility of collaboration," Dr. Katampe said.

Dr. Jackson-Hammond has been an ardent supporter of international engagement and is especially committed to partnerships with Nigeria. "This opportunity to support the TETFund program allows us to integrate Central State University's scholarship and professional development with Nigeria's influential and brightest minds," said Dr. Hammond.

The five-day workshop developed by CSU is designed to support TETFund in its Capacity Building Program (CBP) for enhancement of research activities in the Nigerian Higher Education Institutions. To learn more call 937-376-6677.

Community members visit aquaponics facility during "Twilight Tour."

CSU Advances Aquaponics Research

by CSU CESTA Student Worker Jada Carter

What Is Aquaponics, And Why is it So Important?

You may be wondering, “what in the world is aquaponics, and why should I care about this technology?”

Aquaponics is a closed loop system that combines conventional aquaculture (the raising of aquatic animals such as snails, fish, crayfish or prawns in tanks) with hydroponics (cultivating plants in water) in a mutually symbiotic environment. The aquaponic system utilizes the waste of one element for the benefit of another other. In this case, the waste produced by the fish benefits the growing plants.

Dr. Cindy Folck, Central State University Extension (CSUE)program leader for Agricultural and Natural Resources, explains it this way, “aquaponics is a sustainable system whereby we’re raising both the fish and the vegetable in the same environment,” said Folck. “The fish, through their waste products, provide food for the plants (one part of the system) and the plants, which live off their waste products (the second part).” The final result is fresh, organic produce for consumption. According to Dr. Folck, aquaponics is referred to as “sustainable” because the system doesn’t need to use any other fertilizers since the fish provide it for the plants.

Water from the fish tank goes to a filtration system where excess solids from the fish waste are separated and also converted into nutrients essential for the plant growth. “This is an important step in the process because fish produce a lot of waste, and plants are not always able to use it all. This excess waste must be removed with filtration to maintain the health of the fish. Also it is important to convert toxic ammonia from the waste into nutrients essential for the plant growth.

CSU student researcher shows off aquaponics grown lettuce.

Practicing sustainability helps farmers, or other individuals who want to create an aquaponic system. The system can be preserved as an ecosystem, which means it's creating food for itself in order for it to thrive.

"Aquaponics is a sustainable system whereby we’re raising both the fish and the vegetable in the same environment."
-Dr. Alcinda Folck

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According to Dr. Folck, aquaponics is beneficial for farmers whether they are in rural or urban areas because the system is sustainable, and provides an opportunity for farmers to not only grow and sell fish, but produce as well. "Farmers can earn money and be good stewards of the environment," she said.

CSU greenhouse and aquaponics lab located in front of the Center for Education & Natural Sciences (CENS) Building located on 1523 State Route 42 Wilberforce, Ohio.

Dr. Krishna Kumar Nedunuri is the researcher for aquaponics, professor of Environmental Engineering, and director of the International Center for Water Resources Management at CSU. “Central State has two aquaponic systems, one for research and one for community engagement and workshops (demonstrations),” he stated during the tour. His work primarily takes place in the aquaponics lab in the Central State University Greenhouse. The other system is located at CSU’s research farm across from the main campus. Every week he can be found harvesting lettuce which he often shares with staff, students, and faculty. Lettuce is also distributed by CSU Extension through the Mobile Farmers Market.

“It takes five to six weeks for the lettuce to reach maturity in a typical aquaponics system running within a greenhouse” he said. “One area of research is seeing how the crop responds in different climates and how it can be designed for different settings. This is beneficial for the farmers who may be operating in either rural or urban areas.”

A unique component of the aquaponics research taking place at Central State is the involvement of undergraduate students. In addition to routine tasks such as feeding the fish, students monitor water quality, care for seedlings, and ensure chemicals are properly balanced. This is especially important because CSU’s system uses water treated with chlorine. Researchers check the filters for excess waste, remove it, and add aerators when necessary, to ensure adequate dissolved oxygen essential for fish survival.

"Our students have been involved in the aquaponics facility right from the design stage," said Dr. Nedunuri. "Some have spent up to two years on aquaponics research already, working on the system as it was being built," he added. Undergraduate student researchers include engineering major Darrel Latham, who is responsible for understanding the role water quality plays in lettuce growth; engineering major Emily Archer and biology major Desiree Howard, who investigate the abiotic and biotic factors in the production of lettuce; engineering major Daniel Lee who carries out the engineering design work of filtration tanks in the aquaponic system; and engineering major Kwame Burns who assists faculty with managing the overall system.

The aquaponics research project was a joint effort between Central State University (lead) and the Ohio State University through funding from a United States Department of Agriculture (USDA/)National Institute of Food and Agriculture(NIFA)Capacity Building Grant. CSU’s Aquaponics research has important implications for the community because anyone can pursue a career in aquaponics, and it's beneficial for the environment.

USDA United States Department of Agriculture National Institute of Food and Agriculture

CESTA FACULTY & STAFF SPOTLIGHT

Brandy Phipps, Ph.D.

Title:
Research Assistant Professor of Exercise Science

Funding Source:
Evans Allen Program

Education:
Ph.D. Virginia Tech - Biomedical Sciences (formerly Veterinary Medical Sciences) M.S. Virginia Tech – Human Nutrition, Foods and Exercise B.S. University of Florida – Nutritional Sciences

Key Interests:
Effects of Natural Products and Nutrient Supplementation on Disease Prevention and Progression, Nutrition, Health Disparities and Inequities, Food Insecurity, Underserved Populations, Social Determinants of Health.

Current Research:
Collaborating with hemp researchers to elucidate biochemical properties of the Cannabis plant; determining natural product intervention protocols for prevention and treatment of diseases and disorders; establishing University-based education/outreach programs to increase health and wellness for student and adult populations

Sakthi Subburayalu Ph.D.

Assistant Professor of Soil Science and Agronomy at CSU, Sakthi Subburayalu, Ph.D., presented “Soil Information, Health and Water Quality” at the Research Seminar Series. Each month researchers share with faculty, staff, students, and the community, updates on research projects as well as current trends.

Dr. Subburayalu is president elect of the All-Ohio Chapter Soil and Water Conservation Society, serves on the Natural Resource Conservation Services’ State Technical Committee, and the Ohio 590 Nutrient Management Standards Committee. His research focuses on improving the health of the soil and the quality of water in the region and beyond.

Craig Schluttehofer, Ph.D.

Dr Craig Schluttenhofer presented at the Conservation Tillage Conference in Ada, Ohio on March 3, 2020. He was also featured in several publications including Edible Columbus and Ohio Valley Edible.

READ FULL ARTICLES AT:

https://ediblecolumbus.ediblecommunities.com/food-thought/ohios-embrace-hemp

Dr. Schluttehofer also published CSU's first Agricultural Fact Sheet-ANR 20-1 | FACT SHEET | Agriculture & Natural Resources entitled "Types of Hemp Crops" which can be found at centralstate.edu.

Current research activities: a) quantifying the effectiveness of agricultural best management practices on soil health and water quality, b) mapping agricultural systems and soil health using remotely sensed imageries, and c) identifying optimum conditions for the adoption of precision agricultural technologies such as variable seeding and fertilizer application rates. He also developed a web-based tool for farmers to assess the sulfur nutrient status of their soil.

NEWS & EVENTS

CSU PARTNERS WITH KETTERING HEALTH NETWORK

Dr. Kathleen Carter, Associate Professor at Central State University stands next to Bod Pod. The Gold Standard Body Composition Tracking System which uses whole-body densitometry to determine body composition (body fat and fat-free mass) in adults and children, and can accommodate a wide range of populations. CSU is partnering with Kettering Health Network on a research project to improve the health of employees.

EXTENSION IN THE COMMUNITY

Central State University Extension participates in a wide-range of community events throughout the year. Ambrose Moses, Cuyahoga County Educator, presents information on staying active and eating smart.

J5 IS ALIVE!

Dr. Deng Cao, Associate Professor of Computer Science, demonstrates new robot. The robot will help agricultural researchers in their work to improve soil, sustainability, and crop yield.

MORE NEWS & EVENTS

AMAZING ANIMALS

Central State University Extension, in conjunction with the Wild Hearts Mobile Teaching Zoo, held a free family program allowing participants learn about live animals from all over the world. Animals included amazing birds, scaly reptiles, furry animals, and fascinating insects. Programs were held in Trotwood and Xenia.

INTO THE WOODS

Extension and research staff visited CSU Extension's Forestry Outreach Center in Nelsonville, OH. Jamie Dahl, Forestry Outreach Coordinator for Extension, led the team on an invigorating hike through the woods.

CONVERSATION WITH THE DEAN

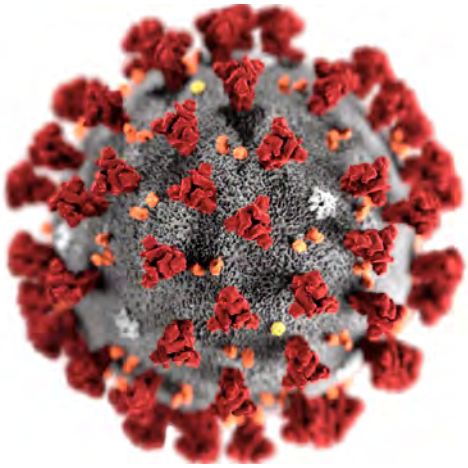
Dean's list students receive awards during the "Conversation with the Dean" event. All participating students were also treated to dinner and engaged in friendly, open, and difficult conversations with Dr. Alton Johnson, Dean.

MORE NEWS & EVENTS

OEFFA 2020

CSU Extension and Research staff present at 41st Annual Ohio Ecological Food and Farm Association (OEFFA) conference held February 13-15, 2020 in Dayton, Ohio. OEFFA cultivates a future in which sustainable and organic farmers thrive, local food nourishes our communities, and agricultural practices protect and enhance our environment.

CSUE RESPONDS TO COVID-19



CSU Extension explores online ways to share the information previously received at face-to-face programs and events. This includes helpful information and videos posted to our social media pages as well as sharing resources, and creating new programs and resources that will be helpful once normal operations are resumed.

WREATH MAKING WORKSHOP

Women in Forestry group participated in a wreath making workshop during the holiday season. Wreaths were made from materials found naturally in the forest in and around Nelsonville, Ohio.

CESTA

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