

2023 AGRESEARCH ANNUAL REPORT

*A YEAR
IN REVIEW*

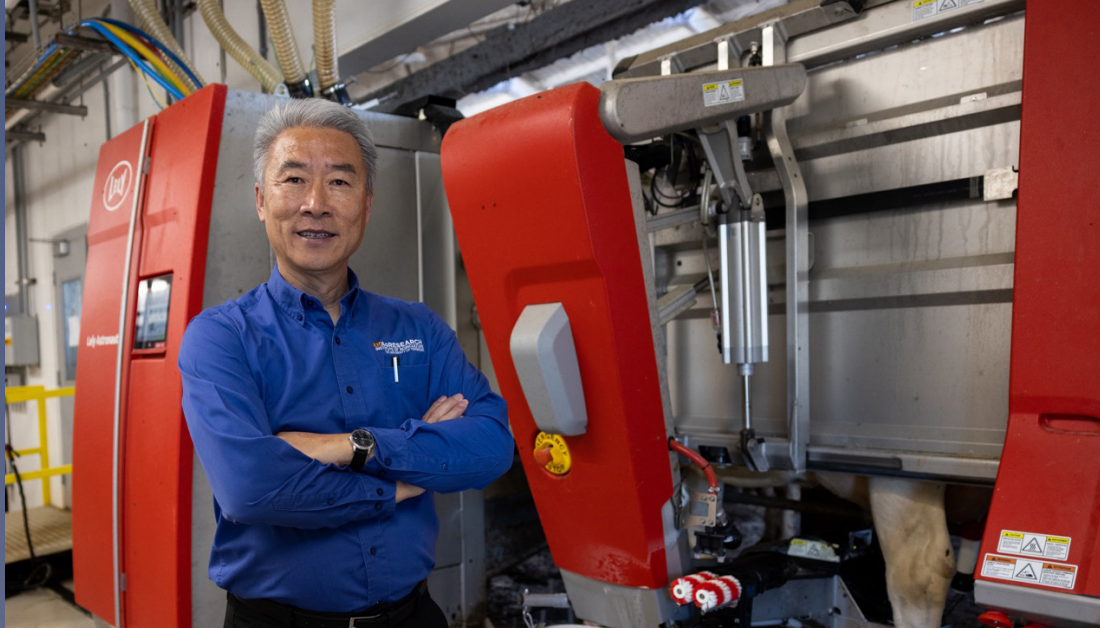
Real. Life. Solutions.™

UTAgRESEARCH
INSTITUTE OF AGRICULTURE
THE UNIVERSITY OF TENNESSEE

Real. Life. Solutions.™

OUR LAND-GRANT MISSION

The nation's land-grant institutions were created in 1862 with the passage of the Morrill Land-Grant College Act to provide excellence in teaching, research, and extension to educate the next generation of farmers, ranchers, and citizens seeking post-secondary education. The University of Tennessee, Knoxville, including the UT Institute of Agriculture, is Tennessee's 1862 land-grant institution. Key to the land-grant system are agricultural experiment stations (AKA UT AgResearch). The UT AgResearch system includes ten stations, now named UT AgResearch and Education Centers. Each center serves as a unique outdoor laboratory, and together they are representative of the state's diverse agricultural and natural resource production as well as its soils, topographies, and climate. Their combined 39,000-plus acres conduct over 1,000 field trials and approximately 20 field days each year, creating and demonstrating Real. Life. Solutions. to farmers, land managers, and allied industries in Tennessee and beyond. The centers also provide ample hands-on experiential learning opportunities to students and showcase the general public how food and fiber are produced.



UT AgResearch's new robotic milking parlor

Colleagues, Friends, and Supporters of UT AgResearch,

Since joining the UT Institute of Agriculture in 2019, my days have never been dull. Still, I can honestly say that 2023 has been the most exciting to date. From the numerous tremendous honors bestowed upon our talented faculty, to the notable 228 percent increase in competitive funds awarded our scientists from numerous federal agencies and private partners, our efforts are ensuring a bright future for UT AgResearch. Neither this letter nor this report can comprehensively list the true scope of our momentum, but UT AgResearch is barreling down a path that will continue to serve our agricultural and natural resource production partners, industry that will benefit Tennessee's economy, and the general population of the state, region and even parts of the world. Here are a few highlights for 2023:

- In the spring we welcomed Keith Carver as the Institute's new senior vice chancellor and senior vice president.
- The East Tennessee AgResearch and Education Center Little River Unit dedicated a new robotic milking parlor and the Plant Science Unit installed a new hopyard with its associated research and extension collaborations.
- AgResearch hosted the Second US Precision Livestock Farming Conference.
- The UT Tree Improvement Program celebrated twenty-five years of a "perfectly aged partnership" with the Jack Daniel Distillery.
- Planning continues for the wise use of the historic \$50 million American Rescue Plan grant funds (awarded in 2022), with some equipment already being purchased and construction underway.
- UT AgResearch successfully hosted thousands of our stakeholders in events across the state, including but not limited to the Summer Celebration at the West Tennessee AgResearch and Education Center; the Steak and Potatoes Field Day and Fall Gardeners Festival, both at the Plateau Center; and the inaugural Precision Livestock Farming (PLF) Field Day at the Middle Tennessee AgResearch and Education Center in Spring Hill.

Each of us played some role in this tremendously successful year, and working together we will continue our upward trajectory and continue to enhance the Real. Life. Solutions. we provide to Tennessee and beyond.

A handwritten signature in black ink, appearing to read "Hongwei Xin".

Hongwei Xin

*Dean and Director, UT AgResearch
University of Tennessee Institute of Agriculture*

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**AgResearch
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for Everyone**

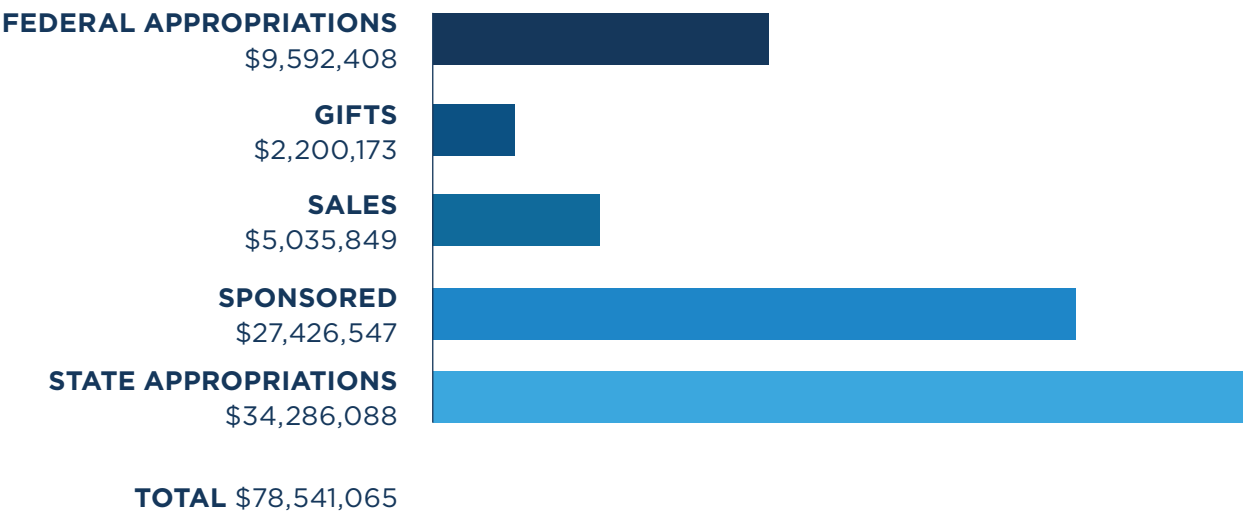


FISCAL SUMMARY

The UT AgResearch budget increased from approximately \$72 million in 2022 to more than **\$78.5 million in 2023**. This includes federal and state appropriations, publicly and privately funded research grants and sponsorships, gifts, endowments, and sales of commodities produced on the AgResearch and Education Centers. We are pleased to report that this represents a modest increase of approximately one percent above the total 2022 budget,

but more importantly since we have been producing these reports (three years, since 2020), **the total fiscal summary has increased by more than \$10 million, from \$68,254,872 to \$78,541,065**. What’s more, 2023 represents the best year yet for faculty obtaining competitive extramural funding: a 228 percent increase over 2022.

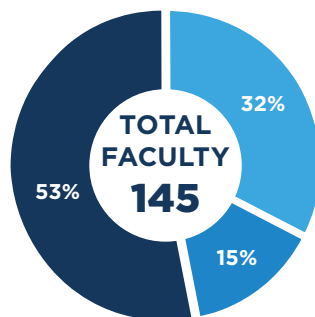
Gifts to UT AgResearch programs are an always welcome resource. In 2023 they were valued at approximately **\$2,200,173**.



UT AgRESEARCH PERSONNEL AND EXPERTISE

To help make the state's agricultural, forest, and ornamental industries more efficient, improve the quality of rural life, and conserve Tennessee's soil, water, air, and wildlife, UT AgResearch harnesses the creative energy of more than **800 Ph.D. faculty, specialized staff, and gifted graduate students**.

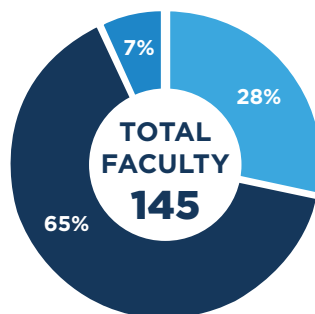
We conduct both basic and applied research on the Institute of Agriculture campus in Knoxville, in partnership with UT Knoxville and the Oak Ridge National Laboratory, and at ten AgResearch and Education Centers across the state. Our programs include seven departments, one school and multiple centers specializing in topics as broad as wildlife health, native grasslands management, beef cattle genomics, row crops, and more.



PROFESSOR FTE **47.37**
ASSOCIATE PROFESSOR FTE **15.56**
ASSISTANT PROFESSOR FTE **32.8**
TOTAL FTE 95.73

PROFESSOR **77**
ASSOCIATE PROFESSOR **21**
ASSISTANT PROFESSOR **47**
TOTAL FACULTY 145

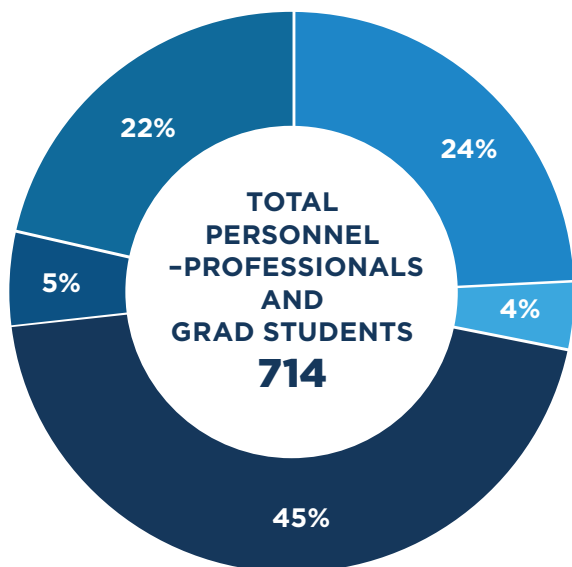
■ **PROFESSOR**
■ **ASSOCIATE PROFESSOR**
■ **ASSISTANT PROFESSOR**



NON TENURE TRACK FTE **7.81**
TENURE TRACK FTE **26.72**
TENURED FTE **61.2**
TOTAL FTE 95.73

NON TENURE TRACK **10**
TENURE TRACK **41**
TENURED **94**
TOTAL FACULTY 145

■ **TENURED**
■ **NON TENURE TRACK**
■ **TENURE TRACK**



■ **OTHER RESEARCH PROFESSIONALS**
322, 45%

■ **POSTDOCTORAL RESEARCH ASSOCIATES**
38, 5%

■ **STUDENTS OTHERWISE FUNDED**
153, 22%

■ **GRAD RESEARCH ASSISTANTS**
173, 24%

■ **GRAD TEACHING ASSISTANTS**
28, 4%

ADVANCING A BIOECONOMY

Beyond Petroleum-based Fuels and Industrial Chemicals

Scientists at the Center for Renewable Carbon have been diligently working to shift the fundamentals of our nation's industrial complex from a petroleum base to new technologies that enable the sustainable use of carbon from biomass for materials, chemicals, fuels, and energy. This includes identifying sustainable source feedstock, supply chain logistics, and the structure and chemistry of manufacturing inputs, as well as valuable uses for manufacturing products and co-products. Our researchers collaborate with colleagues across the region and nation, including scientists at the Oak Ridge National Laboratory and the National Renewable Energy Laboratory, as well as industry. The vision is simple: a thriving economy based on sustainable and environmentally friendly agricultural-based products.

Regional Innovation Engines for the Future

One prominent advance for the UT Center for Renewable Carbon in 2023 is a collaboration led by the HudsonAlpha Institute for Biotechnology, from Huntsville, Alabama. HudsonAlpha, along with several collaborators from industry, non-profits as well as 1862 and 1890 land-grant institutions, was awarded \$1 million from the National Science Foundation's Regional Innovation Engines Program. They are among more than 40 unique teams to receive one of the first-ever NSF Engines Development Awards. Focused

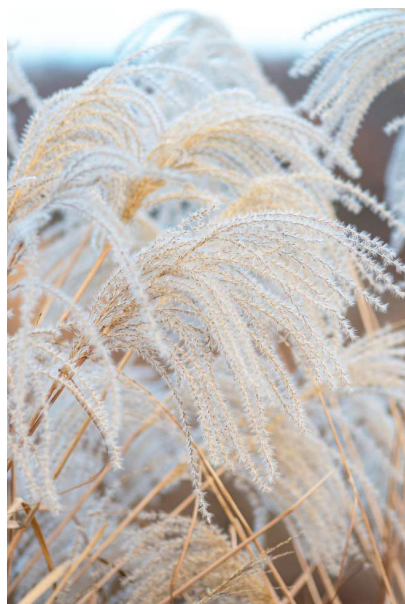
on economic engines, rather than those that provide mechanical propulsion, the NSF Engines Development Awards aim to help partners collaborate and create economic, societal, and technological opportunities for their regions. The goal for this planning grant is to help establish a green bioeconomy in the Southeast, while creating jobs and training diverse individuals across STEM (science, technology, engineering and mathematics) disciplines.

The funded project, "Advancing carbon-neutral crop technologies to develop sustainable consumer goods (AL, GA, NC, TN)—Greening the Southeast" for short—aims to develop a green, circular bioeconomy for construction materials, automotive components, and consumer goods in the Southeast. The intent is to reduce climate change impacts from manufacturing by eliminating industry reliance on petroleum and environmentally costly fibers. "The Engines Program provides such a unique opportunity to have an impact that will benefit our stakeholders and advance our resilience in the face of future climate events," said Nicole Labbé, professor and assistant director of the UT Center for Renewable Carbon and lead UT scientist on the project. "We're particularly excited to work with this creative and energetic team of leaders that is intent on expanding the Southeast's bioeconomy, creating a bright future with new avenues for prosperity."

Reducing the Carbon Footprint of Sustainable Aviation Fuels (SAF)

The U.S. Department of Energy (DOE) Bioenergy Technologies Office awarded \$18.6 million in funding to eight university and industry projects to develop biomass feedstocks to produce affordable biofuels and bioproducts that reduce greenhouse gas (GHG) emissions. Located in eight states, the projects will create good-paying jobs, support rural economies, and encourage participation of underserved communities, all while putting the United States on a path to a clean and equitable energy economy. A team of researchers from multiple institutions and industry partners led by UT's Nourredine Abdoulmoumine, Sindhu Jagadamma, Nicole Labbé, and Deborah Penchoff was among the award recipients, receiving a \$4.5 million grant to study the use of biochar during SAF feedstock production. The goal is to sequester carbon, reduce fertilizer needs, and reduce the overall carbon footprint for SAF production. The DOE's Sustainable Aviation Fuel (SAF) Grand Challenge is to produce 35 billion gallons of low-greenhouse gas emission SAF made from domestic biomass and waste resources annually by 2050. The UT-led team proposed that decarbonizing

each step of the supply chain will decrease the carbon intensity of SAF. Since soils are among the largest carbon sinks on Earth, soils in SAF feedstock production systems could serve as significant carbon sinks within the supply chain. The team plans to amend feedstock production soils in multiple Southeastern locations with a biochar and poultry litter combination to sequester carbon and reduce the need for synthetic fertilizers while simultaneously improving beneficial ecosystem services including enhanced crop productivity and soil health and diminished emissions. Biochar was chosen because it is a by-product of thermochemical SAF production pathways and, thus, returning it back to the SAF feedstock production system creates a circular system where soil nutrient/carbon stocks are replenished. Two energy crop systems were chosen for the study: giant miscanthus and biomass sorghum. The team will deploy a suite of modeling approaches and tools to decipher biochar-soil-crop-performance relationships and assess the economic viability and the sustainability of amending crop systems with biochar and biochar with poultry litter in a SAF production context in the Southeast.





ONE HEALTH AT UT

Housed within UT AgResearch, the UT One Health Initiative is a UT System-wide approach aimed at preserving and promoting human, animal, plant, and environmental health while advancing economic growth. It's part of a global movement across multiple disciplines, including environmental, medical, and veterinary sciences.

Ongoing studies of interest include climate change; emerging infectious diseases transmitted by water, food, and insects; as well as producer stress and mental health. A complete description of the initiative can be found online at onehealth.tennessee.edu

New to the initiative this year are two studies totaling more than a half-million dollars that will involve identifying and characterizing chronic wasting disease in wild cervid (deer) populations. These studies are among some \$2.9 million awarded to sixteen universities. The projects will allow recipients to further develop and implement chronic wasting disease management, response, and research activities in wild cervids, including surveillance and testing.

Chronic wasting disease is a major and growing concern among the state's hunters, landowners, and wildlife officials. An infectious, degenerative disease of cervids that causes brain cells to die, ultimately leading to an animal's death, the disease is also affecting hunter confidence, landowner livelihoods, and state regulations and oversight. While there is no evidence of the

disease infecting humans, both the Centers for Disease Control and Prevention and the World Health Organization recommend you avoid eating venison from an animal positive for the disease. If you hunt in a chronic wasting disease zone, submit every harvested deer for testing, and wait for satisfactory results before eating the venison.

New tools and approaches will enable improved management of wild and farmed cervids at risk for the disease. Shigetoshi Eda, a professor in the School of Natural Resources and co-chair of Chronic Wasting Disease Working Group at UT, was awarded \$269,127 from the US Department of Agriculture Animal and Plant Health Inspection Service (USDA APHIS) and the Chronic Wasting Disease Alliance for the development of a new platform for rapid and sensitive detection of disease prions in live animal samples. This technology should help in identifying populations infected with chronic wasting disease prior to harvest. Eda had previously received AgResearch and One Health Initiative seed funding.

Lisa Muller and Mark Wilber, professor and assistant professor, respectively—also in the School of Natural Resources—received a separate \$250,000 award from APHIS to study reproduction and recruitment in a high prevalence chronic wasting disease area in West Tennessee, especially at the Ames AgResearch and Education Center in Grand Junction.

The UT One Health Initiative announced recently a third round of seed funding, which offers internal funds to support collaborative, One Health-related research projects across the UT System. With co-funding support from the UT College of Veterinary Medicine Center of Excellence, Tennessee RiverLine*, and the UT Humanities Center**. Three \$40,000 awards were announced:

- **Mycotoxins in Cannabis: Implications for One Health**

Principal Investigator: Kimberly Gwinn (UTIA, Herbert College of Agriculture, Department of Entomology and Plant Pathology)

Co-PI: Julia Albright (UTIA, College of Veterinary Medicine, Small Animal Clinical Sciences)

- **Modular Landscapes: Tackling Water Quality through Arts and Science***

Principal Investigator: Sarah Bolivar (College of Architecture and Design, School of Landscape Architecture)

co-principal investigator Michael Ross (UTIA, Herbert College of Agriculture, Department of Plant Sciences; College of Architecture and Design, School of Landscape Architecture)

Co-Principal Investigator: Jason Brown (College of Arts and Sciences, School of Art)

- **Lixus, City and Country: Environment and Sustainability in an Ancient Landscape (Larache, Morocco)****

Principal Investigator: Stephen Collins-Elliott (College of Arts and Sciences, Department of Classics)

Co-Principal Investigator: Alison Damick (McClung Museum of Natural History and Culture)

The teams awarded with seed funding in the previous two rounds of the program have already generated more than \$4 million of external funds and provided invaluable training opportunities to UT students.





SMITH CENTER FOR INTERNATIONAL SUSTAINABLE AGRICULTURE

Engagement Beyond Our Borders

The Smith Center for International Sustainable Agriculture is positioning UTIA as the go-to organization for global engagement in agricultural and related sciences among US land-grant institutions. Launched in 2017 and endowed through generous donations from Donnie Smith (BS animal science, '80) and his wife Terry Smith (BS elementary education, '80), the center cultivates global engagements for faculty, staff, and students across UTIA, and helps coordinate international research and outreach opportunities. The Smith Center's efforts are helping to increase the number of strategic global partnerships and communicate the importance of UTIA's global work.

Examples from 2023 include a new farmer-to-farmer outreach effort and faculty and scientific exchange program.

Farmer-to-Farmer

UTIA was awarded a five-year grant through the John Ogonowski and Doug Bereuter Farmer-to-Farmer (F2F) Program. The initial award is for \$5 million, with the potential for a further \$25 million in funding from the United States Agency for International Development (USAID). F2F provides technical assistance from US volunteers to farmers and agricultural groups in foreign countries to promote sustainable improvements in food security and agricultural production, processing, and marketing. The Smith Center for International Sustainable Agriculture is the

lead partner for the Agricultural Leaders of Tomorrow (ALOFT) regional F2F program for Southeast Asia.

ALOFT will partner with and support youth-led and youth-serving institutions to build more resilient and inclusive food systems in three core countries: Cambodia, the Philippines, and Vietnam. This program will integrate youth into target agricultural value chains through four areas of technical assistance: 1) climate-smart agriculture; 2) agricultural entrepreneurship and agribusinesses; 3) agricultural education; and 4) extension and advisory services. ALOFT will recruit experts in these areas from farms, agribusinesses, cooperative extension services, and universities in the US to participate in short-term volunteer assignments with host organizations in Southeast Asia.

Faculty and staff at UTIA are already engaged in educating the next generation of agricultural leaders through their research, education, and extension mission. UTIA has the largest 4-H club program in the US, directly training more than 135,000 youth annually across Tennessee. The Smith Center hopes to leverage the work already being done across the Institute to empower youth in agriculture, and to draw on the expertise of UT Extension specialists and agents to deliver impactful technical assistance to partners in Southeast Asia.

ALOFT will recruit the best of US volunteer expertise for specific F2F assignments, requested by host organizations in the core countries. This program will draw on the wide range of expertise across the land-grant community, non-governmental organizations, private sector, and other institutions to support the next generation of global agricultural leaders and foster deeper partnerships between the US and Southeast Asian partners.

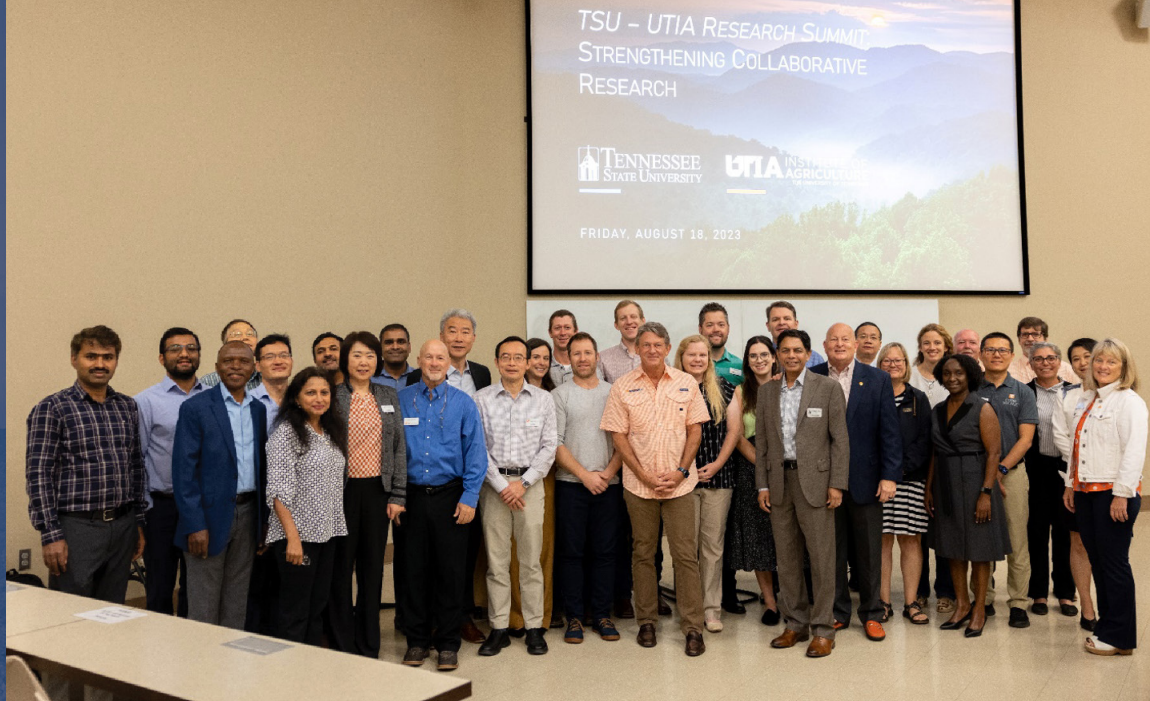
USDA FAS Faculty Exchange Programs

The UT College of Veterinary Medicine and the Smith Center hosted nine Faculty Exchange Program and five Scientific Exchange Program veterinary medicine fellows from four countries for the duration of the fall 2022 semester. These programs are funded through the the United States Department of Agriculture Foreign Agriculture Service (USDA FAS), and they focus on veterinary teacher pedagogy and animal health governance.

One of the outputs from participating in these programs included the UT College of Veterinary Medicine, in partnership with the Smith Center, hosting a workshop on animal health, governance, and policy at the International Livestock Research Institute in Nairobi, Kenya, in June 2023. The workshop was sponsored by the USDA FAS and included presentations from several of the USDA FAS 2022 Faculty and Scientific Exchange Program Fellows. Approximately thirty-five attendees represented a variety of organizations, including several non-governmental organizations, universities, local and regional governments, research institutions, and private veterinary practices. This workshop was one stop during a larger UT Knoxville delegation visit to Rwanda and Kenya. The purpose of this trip was to create new partnerships and build on existing collaborations.

These USDA FAS exchange programs function to train the next generation of scientists; train policymakers and agricultural educators to better understand the global agricultural marketplace; support science-based trade policies; increase scientific knowledge and collaborative research; and extend knowledge to users and intermediaries in the international agricultural marketplace. The College of Veterinary Medicine and the Smith Center hosted another group of fellows from the Philippines in fall 2023.





TENNESSEE LAND-GRANT INSTITUTIONS HOLD INAUGURAL AGRICULTURAL RESEARCH SUMMIT

Over the past five years, UT and TSU faculty have collaborated on \$40 million of funded research and another \$60 million of collaborative efforts are proposed or are currently pending funding.

Tennessee is among several states with two land-grant institutions, the UT Institute of Agriculture (an 1862 institution) and Tennessee State University College of Agriculture (an 1890 institution). The two recently met to exchange ideas for enhancing the livelihood of Tennessee producers and the quality of life for all Tennesseans as well as for others beyond the state.

The summit was held at UT Knoxville, and leaders from UT attending included UT System President Randy Boyd, UTIA Senior Vice Chancellor and Senior Vice President Keith Carver and UT Knoxville Vice Chancellor for Research and Economic Development Deborah Crawford. TSU College of Agriculture Dean Chandra Reddy, UT AgResearch Dean Hongwei Xin, UT AgResearch Associate Dean Tim Rials, and TSU Interim Associate Dean for Research Fulya Baysal-Gurel welcomed the attendees. All the leaders praised the scientists for their cooperative efforts to help the state's producers enhance Tennessee's

economy and agricultural and natural resource industries.

Scientists across both institutions are already collaborating to address some of the grand challenges facing Tennessee and the region. Over the past five years, UT and TSU faculty have collaborated on \$40 million of funded research and another \$60 million of collaborative efforts are proposed or are currently pending funding.

During the summit, sixteen faculty representing the disciplines of animal science and food science from both universities provided program overviews as well as examples of current collaborations. Participants left with ideas for future synergies and follow-up action plans. The next joint summit will be held in Nashville on the TSU campus in March 2024.

PLANTING VEGETABLES BETWEEN TREES MAY BE ONE WAY TO COPE WITH CLIMATE CHANGE

Alley cropping may be a viable solution to mitigate crop stress and improve the sustainability of organic vegetable production amid climate extremes in the Southeast, at least researchers and Extension specialists with UTIA believe this may be the case. A new study may help them find out.

Alley cropping is an agroforestry practice where herbaceous annual crops—think vegetables—are grown in wide alleys between rows of trees. The buffering ability of the trees may increase the resiliency of the vegetables by reducing stress caused by heat extremes. Such stress can significantly reduce yields and quality.

In this project, the research team plans to use black locust and honey locust, to provide dappled shading that reduces excess heat without negatively affecting vegetable crops planted in between the rows of trees. In addition to moderating temperature extremes, the trees should increase landscape biodiversity, lessen evaporation and wind velocity, and reduce the impact of heavy rainfall. The cropping system also has the potential to improve soil fertility due to plant nutrients being recycled as tree litterfall, reducing the need to amend the soil with costly fertilizer. Further, the system promotes carbon storage and creates a mutually beneficial environment where key nutrients are exchanged.

Considering that only one percent of farms in the US have adopted agroforestry systems like alley cropping, it is likely that the lack of technical knowledge regarding system design and management, and information on economic feasibility are barriers to adoption. This study aims to address these barriers.

The project is targeted to certified organic and similarly managed production systems, as these growers have a greater familiarity with similar ecosystem-based management strategies, but the practice should apply to conventional cropping systems, potentially providing larger-scale benefits to environmental sustainability.

The research team has partnered with producers in all three regions of the state, with four on-farm sites in rural and urban locations. Further, they have partnered with Memphis Tilth and the Appalachian Resource Conservation & Development Council to facilitate grower outreach. The project has an integral educational component that includes on-farm workshops and demonstrations.

The study team includes David Butler, Avat Shekoofa and Annette Wszelaki from the Department of Plant Sciences, and Carlos Trejo-Pech and Margarita Velandia from the Department of Agricultural and Resource Economics. This three-year grant is funded by USDA-NIFA through Sustainable Agriculture Research and Education program.





PRECISION LIVESTOCK FARMING

The Future of Animal Production

Significant improvements in the production efficiency of all livestock sectors is needed to meet the anticipated growth in demand for animal proteins worldwide over the next thirty years, and UT AgResearch is committed to helping Tennessee producers meet that demand through precision livestock farming techniques. These techniques involve improving an individual animal's health and well being through real time monitoring of the animal's condition. Measured on an individual animal

basis, the data allow producers to make better animal, herd, or flock management decisions based upon quantifiable, objective measures.

This multi year shift in data collection involves many equipment upgrades. More than two dozen researchers and staff across multiple departments are engaged in the work.

Learn more about the Precision Livestock Farming Initiative at plf.tennessee.edu.

Left to right: Bill Weigel, CEO of Weigel's Stores, Inc.; Hongwei Xin, dean and director of UT AgResearch; Randy Boyd, UT president; Stan Butt, executive director, TN Dairy Producers Association; Donde Plowman, UT chancellor; Charles Hatcher, commissioner, TN Department of Agriculture; Eric Mayberry, president, TN Farm Bureau Federation; Rhedona Rose, executive vice president, TN Farm Bureau Federation; Keith Carver, UTIA SVC/SVP

Robotic Milkers Installed at Little River Unit; Precision Livestock Farming Technologies Highlighted at Middle Tennessee

In May UT AgResearch conducted a ribbon cutting and demonstration of the new robotic milking technology installed at the East Tennessee AgResearch and Education Center's Little River Unit. The new system allows cows to be automatically milked at their own will under a stress-free environment. Cows are trained to walk up to the robotic system, where each animal will be recognized by a sensor on her collar. The system then knows how much feed to give the cow while she's being milked, based on historical data. The cow is free to eat, drink, and rest while being milked, and in an area where there is less cattle traffic. About 120 dairy cows can be milked on the two-robotic milker system, and performance records are being

kept for each individual animal. UT scientists will observe many different aspects of dairy cattle performance, including milk production, feeding data, measurements of cow comfort, and more.

In September, the Middle Tennessee AgResearch and Education Center at Spring Hill hosted a Precision Livestock Technologies: Beef and Forage Systems Field Day. Researchers shared information relevant to cow efficiency, bull development, and computer vision technology focused on improving cattle health. Forage discussions were also held at the center's Hickman Precision Livestock Technology Unit.

UT AgRESEARCH POISED TO LEAD PRECISION LIVESTOCK FARMING RESEARCH IN THE REGION

Hosts Second US Precision Livestock Farming Conference

Some of the world's best minds focused on profitable and sustainable livestock production attended and presented at the Second US Precision Livestock Farming Conference. Hosted by UT AgResearch in May, the event attracted 219 attendees representing 22 countries and 32 US states. Participants included academics, representatives of government agencies and allied industries, as well as producers. The conference had a central theme of "Field Application of Precision Livestock Farming Technologies" and academic presentations along with two industry and producer panels included interactive dialogues among the attendees about ways to increase field adoption of precision technologies.

More than 125 scientific papers were published in the conference proceedings, and 20 of those will be published in an upcoming special edition of the international journal *Animals*. This is made possible thanks to a US Department of Agriculture National Institute for Food and Agriculture (USDA NIFA) conference-

strengthening grant to sponsor a mentoring luncheon for young professionals and early career scientists, attendance scholarships for minority producers, and attendance scholarships for faculty and extension educators from minority-serving institutions. The grant will cover the publication costs for papers that were written by educators and scientists from minority-serving institutions.

Hongwei Xin, dean of UT AgResearch, said, "The conference, in conjunction with the USDA NIFA Inter-Disciplinary Engagement in Animal Systems (IDEAS) Program principal directors annual meeting and the annual meeting of a multistate project on precision livestock management, provides a boost to the UT Precision Livestock Farming Initiative while enhancing global collaborations toward seeking Real. Life. Solutions. for the livestock agriculture."



Left to right: Robert Burns, UTIA distinguished professor; Tammy Brown-Brandl endowed chair and professor, University of Nebraska; Angelica Van Goor, national program leader, USDA NIFA; Kalyne Reed, business development manager, Evonik Corporation; Jeff Aiken, deputy commissioner of TN Department of Agriculture; Hongwei Xin, dean and director of UT AgResearch



ROWAN RECEIVES NEW INNOVATOR AWARD

The Foundation for Food and Agriculture Research (FFAR) announced its latest cohort of “New Innovators” and Troy Rowan, an assistant professor of Animal Science and UTCVM Large Animal Clinical Science, is among the 10 scientists recognized nationally for their cutting-edge research.

The New Innovator in Food and Agriculture Research Award is granted to early-career scientists to support work in one of FFAR’s Challenge Areas, including Advance Animal Systems — research that improves animal health and welfare and pioneers practices that sustain our food system.

While beef cattle have experienced massive gains in virtually every measure of efficiency over the last 50 years, further increases in efficiency will be critical for meeting the growing global demand for protein. The beef industry faces pressure to reduce its environmental footprint and help combat climate change. To meet these issues, Rowan and others on his research team, plan to leverage machine learning, high-throughput phenotyping, and genomics to measure and predict sustainability-related traits like water use, forage intake, and

methane emission. Additionally, Rowan’s team will use genomic approaches to identify genes and genetic networks affecting sustainability traits. Together, this information can be used to create genetic selection tools and precision management strategies that empower producers to maximize efficiency while reducing the industry’s environmental footprint. An additional goal is to better understand how environmental adaptation and robustness in cattle can help equip animals for an increasingly volatile climate.

Our group is interested in identifying areas where we can use genetics to improve the efficiency of forage-based cow-calf production. To address these challenges, we use genomics and high-throughput phenotyping to identify and select more efficient cows.

Investing in Research Capacity



MODERNIZING FOR THE FUTURE

One-time Funds Help Upgrade Research Equipment and Facilities

UT AgResearch was fortunate to receive \$50 million from the state in funding from the American Rescue Plan. We are conscientiously, respectfully, and intentionally planning their efficient use for infrastructure improvements, such as a new next-gen broiler research facility, a modern greenhouse, and equipment updates that will allow us to produce current, relevant, and innovative research. These funds are being applied at each of our ten AgResearch and Education Centers located throughout Tennessee.

The centers are situated such that research performed on these working farms reflects the climate, topography, soils, and other conditions faced by the state's agricultural producers. The improvements are imperative to enable our scientists to provide accurate data reflecting modern practices that support our AgResearch stakeholders, strengthen communities, invigorate local economies and the American economy as a whole, and improve the quality of life for the citizens of Tennessee and beyond.

In the words of the directors of our AgResearch and Education Centers. "These upgrades are welcome and vital to our continued effectiveness."



“

With the ARP funding, we decided that our best plan was to take our 4-row picker that is still in good shape and convert it to a plot picker capable of harvesting two 2-row plots. We sent it to a vendor in Mississippi who fabricated weigh baskets, along with load cells and the necessary software and firmware to allow the picker to harvest research plots. This was made possible because we purchased the 6-row, on-board module building John Deere CP690, which is the latest development in cotton harvesting. This machine replaces five pieces of equipment (picker, tractor + boll buggy, and tractor + module builder) along with three operators and a fourth ground person to help put tarps on modules. So, in addition to reducing the equipment and labor required for cotton harvesting, it harvests 50% more rows (6 vs. 4) and operates 80% faster (5.5 mph vs 3 mph), and harvests cotton much quicker, with less labor and equipment and allows us to do other harvest-time activities (harvesting soybeans, planting wheat, etc.) in a much more timely manner.

- Blake Brown, director, AgResearch and Education Center at Milan

”



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Conducting research and determining differences among treatments in a trial requires statistics and the power of statistics is increased by increasing the number of experimental units. In animal nutrition trials, the C-Lock Smart Feeders will measure individual animal intake.

This results in each animal being its own experimental unit and greatly increasing the statistical power of the trial. This allows greater quality and frequency of data collection and allows faculty to publish results in a shorter time frame.

- Walt Hitch, director, Plateau AgResearch and Education Center

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The new modern cattle chute will allow us to increase the efficiency of how cattle are worked through the chute in order to perform various research projects including taking weights and introducing various reproductive technologies.

- Matt Backus, assistant director, Ames AgResearch and Education Center



The new heavy duty trailer will enable the staff to move research support mobile equipment and supplies to remote project locations. Other uses of the heavy duty utility trailer will be to move logs and wood debris from research project maintenance operations and from project access roads.

- Kevin Hoyt, director, Forest Resources AgResearch and Education Center



These improvements are enabling us to enhance our farm and livestock lanes, fencing, and feeding areas to better accommodate the utilization of newly acquired precision livestock farming (PLF) equipment. The combination of facilities improvements and PLF equipment has and will continue to be a new and versatile resource. These enhancements have provided a different way of approaching and collecting critical information. We have already experienced an increase in collaborative work within and between UTIA departments. I think this new technology will grow researchers' creativity and ability to more rapidly impact research outcomes outcomes that are directly related to beef cattle efficiencies of production providing a positive economic impact to our state's beef cattle industry.

- Kevin Thompson, director, Middle Tennessee AgResearch and Education Center, at both Spring Hill and Lewisburg



We've purchased a Kincaid 4 row Step 4 precision plot planter, which will allow us to plant at row spacings between 15 40 inches using a telescoping toolbar, and using GPS, auto trips seed for precise seed placement. This planter will primarily be dedicated to cotton, corn, and soybeans.

- Scott Stewart, director, West Tennessee AgResearch and Education Center, Jackson



NEW ENDEAVORS AT THE EAST TENNESSEE AGRESEARCH AND EDUCATION CENTER

In addition to the newly installed robotic milkers, described in the Precision Livestock Farming section, the East Tennessee AgResearch and Education Center has made some important research additions that will cement our external relationships with two very different sets of industry partners: brewers and turfgrass managers.

Researchers and Extension specialists teamed up to support the state's growing craft brewery industry by constructing and planting a new UT Hopyard at the Plant Sciences Unit on Alcoa Highway in Knoxville. The UT Hopyard enjoyed a successful first harvest in late August, and this and future data will generate much needed hops production information for the area. In addition, the UT Hopyard will provide a site for future educational hands on demonstrations and training for hops producers and industry partners.



Near the hopyard is the site of the UT Center for Athletic Field Safety. It's known for its mission to develop the best, the safest natural grass playing fields. The Center includes a newly constructed 4,000-square-foot climate-controlled building. Provided with private funds from the FIFA organization, the facility includes grow lights for turfgrass research as well as surfaces to test the response of grasses to shoes, equipment, maintenance and more. The project is being led by John Sorochoan, distinguished professor of turfgrass science and management in the Department of Plant Sciences and includes collaborators from Michigan State University. The work is designed to support the 2026 FIFA World Cup, which will be one of the largest and most intense athletic endeavors ever. Sorochoan will lead a team of experts who will develop and maintain all sixteen of the 2026 FIFA World Cup fields. Hosted by "United 2026," a partnership of the United States, Mexico and Canada, the tournament will include forty-eight national teams (an increase over the typical 32), use sixteen stadiums and as many as 150 practice fields stretched across four time zones and three climatic zones. While the work is focused on "football" for now, players at all levels of

all sorts of sports—from youth to professional athletes—will benefit from the turfgrass research and improvements to playing surfaces and equipment for years to come.





**Investing in
People**

ERNEST BERNARD NAMED THE 2023 UTIA INSTITUTE PROFESSOR

Ernest Bernard, professor in the Department of Entomology and Plant Pathology, is the recipient of the 2023 UTIA Institute Professor Award. The title of Institute Professor is awarded to a faculty member who has served at the rank of professor for a period of at least seven years and in recognition of consistent outstanding performance over this period. Leadership and reputation through service at the national and/or international levels within the faculty member's scientific discipline is also expected.

Bernard has dedicated forty six years of service to UTIA and the Department of Entomology and Plant Pathology, with his deepest satisfaction and accomplishment being the success of his graduate students. Throughout his career, Bernard has mentored more than twenty five students, fostering their growth and academic

achievements. In recognition of Bernard's commitment to teaching and mentorship, he was recognized by the National Association for Colleges and Teachers of Agriculture Award of Merit in 1999.

Bernard is renowned for his research on nematology diversity and was elected a Fellow of the Society of Nematologists in 2006. In 2018 the Michigan State University Entomology Department recognized him as a Distinguished Alumnus. Bernard has served on the Board of Directors of Discover Life in America, Chair of the UT College of Agriculture Sciences and Natural Resources Graduate Academic Council, President of the Society of Nematologists and editor in chief of Journal of Nematology. For the past twelve years, Bernard has served as the editor for minor insect orders for Zootaxa.



NOTEWORTHY ACHIEVEMENTS

Phillip Myer Recognized by the American Society of Animal Science

Phillip Myer, associate professor in the Department of Animal Science, was recognized with the Outstanding Early Career Animal Scientist Award in Research by the American Society of Animal Science (ASAS). The award recognizes outstanding achievements for early career scientists in the area of research activity.

Myer's research focuses on gut microbiology in beef cattle with an emphasis on the rumen microbiome and its significance to feed efficiency and nutritional physiology. His research has resulted in regional, national and international invitations to speak and has informed reports to congress on advancing agriculture. He helped create the web site **rumenmicrobes.utk.edu**, where anyone can learn about the science of microorganisms and animal nutrition.

Myer has secured more than \$2 million in extramural support and has more than 170 publications, including forty-eight refereed journal articles, two books/chapters, and seventy-four abstracts. He has advised nine MS and three PhD students, four international interns, and three visiting scholars.

ASAS fosters the discovery, sharing and application of scientific knowledge concerning the care and responsible use of animals to enhance animal and human health and well-being.



Food Scientist's Lifelong Career Honored

Qixin Zhong, professor in the Department of Food Science, has been named an Institute of Food Technologists (IFT) Fellow. The honor was bestowed as a result of Zhong's years of contribution to food science and to IFT through his scientific, engineering, and leadership efforts. In his research enhancing food quality, safety, and healthfulness, Zhong creates multi-length scale structures to improve the function of food ingredients. His cutting-edge innovations and research developments have impacted countless producers and consumers. His lifelong accomplishments in food ingredient science have deepened our understanding of food composition and characteristics, and help to ensure what we eat is safe and healthy.



Carrier Receives International Award for Outstanding Leadership

Julie Carrier, professor and head of the Department of Biosystems Engineering and Soil Science, was awarded the James R. and Karen A. Gilley Academic Leadership Award during the Annual International Meeting of the American Society of Agricultural and Biological Engineers (ASABE).

The award was given in recognition of Carrier's exceptional leadership as department head as well as her ongoing dedication to furthering the UT Institute of Agriculture's mission to provide research and extension initiatives at the local, state, national and international level. Under her supervision, the department has developed new technologies and completed cutting-edge research and outreach efforts that have helped improve agricultural production worldwide.

Carrier is a lauded researcher whose work includes improving the harvesting and storage of medicinal

plants as well as seeking new ways to maximize biomass quality, composition, and production.

Throughout her career, Carrier has published almost 100 peer-reviewed journal articles and served on more than twenty scientific panels with the USDA, National Science Foundation and Department of Education. She was also the recipient of the John L Imhoff Outstanding Research Award in 2015 at the University of Arkansas College of Engineering and has been a member of ASABE for more than eighteen years.

Xin Recognized with LeggACY Maker Award

The Egg Industry Center recognized Hongwei Xin, dean of University of Tennessee AgResearch, with the 2023 LeggACY Maker Award for his commitment and achievements in advancing the egg industry and the mission of the Egg Industry Center (EIC).

During his time at the Center as the founding director, Xin helped establish communications channels with egg farmers, their associations, donors, board members, and many other center stakeholders. Xin was a principal investigator (PI) or Co-PI of \$74M in competitive grants and contracts for research, extension, and education projects. An integral part of his research and extension programs focused on practical and timely solutions to issues that greatly impacted the entire US egg industry.

A hallmark accomplishment since joining UTIA in 2019 is Xin's persistent work with UT administration and key stakeholders in successfully securing \$50 million in funding to modernize UT AgResearch infrastructure and equipment at the ten AgResearch and Education Centers across the state. He was also instrumental in developing and implementing the UT AgResearch Strategic Action Plan. UT AgResearch's sponsored research expenditure has increased more than 40 percent in the past four years.



REPRESENTING OUR CENTERS ON THE NATIONAL STAGE

Representatives from agricultural institutions across the nation visited multiple UT AgResearch centers during the fall meeting of the Research Center Administrators Society (RCAS) in September. UTIA was selected to host the conference to share decades of scientific and agricultural contributions with research center managers, directors, and administrators from institutions throughout the United States.

During the four day conference, attendees gained insight into the various departments, academic colleges, partner organizations, and research facilities that contribute to UTIA's ongoing mission to provide innovative solutions for producers at the local, state, national, and international level.

Blake Brown, former president of RCAS and director of the AgResearch and Education

Center at Milan, says, "Even though attendees come from different institutions, we are all working toward the same goal: to provide support for our communities through research initiatives that contribute to the long term success of local farmers." Brown is one of four UTIA center directors who hosted the fall 2023 meeting. Other participants included Walt Hitch, treasurer of RCAS and director of the Plateau AgResearch and Education Center in Crossville; Scott Stewart, director of the West Tennessee AgResearch and Education Center in Jackson; and Rob Ellis, director of the Highland Rim AgResearch and Education Center in Springfield.

UTIA's ten research centers continue to set the precedent for innovative agricultural development statewide and beyond.



UT AgResearch and Education Center directors Scott Stewart (left), Rob Ellis (left, standing), and Walt Hitch (right), host a wagon tour of the Plateau AgResearch and Education Center for attendees of the national Research Center Administrators Society (RCAS) in September.

NOTEWORTHY ACHIEVEMENTS

continued

Department of Agricultural and Resource Economics

Chris Boyer, professor and assistant department head, and **Edward Yu**, professor, have been appointed editors of the *Journal of Agricultural and Applied Economics*.

Andrew Muhammad, professor, was selected for the nineteenth class of the Leadership for the 21st Century (LEAD21) program. He was also chosen to serve on a subcommittee of the Board for International Food and Agricultural Development, working with industry leaders, scientists, and academics to deliver solutions to climate and environmental issues affecting agriculture and global food systems.

Carlos Trejo-Pech, associate professor, was appointed editor of the *Journal of Food Distribution Research*.

Sreedhar Upendram was promoted to associate professor with tenure.

Department of Agricultural Leadership, Education and Communications

Tyler Granberry, assistant professor, was recognized for a distinguished manuscript at the American Association for Agricultural Education section of the Southern Association of Agricultural Scientists conference.

Agricola Odoi (College of Veterinary Medicine Administration), **Christopher Stripling**, professor and head, and **David White** (Herbert College of Agriculture Administration) are members of the 2023-2024 Chancellor's Leadership Academy

Department of Animal Science

Phillip Myer, associate professor, was recognized with the Outstanding Early Career Animal Scientist Award in Research by the American Society of Animal Science.

Troy Rowan, assistant professor, was awarded a New Innovator Award by the Foundation for Food and Agriculture Research (FFAR). The award marks the first UT FFAR New Innovator

Award. The award provides early career scientists with the investment needed to propel them into successful research careers.

Yang Zhao was promoted to associate professor with tenure and received the T.J. Whatley Distinguished Young Scientist Award and the UT AgResearch Dean's Grantsmanship Award.

Department of Biosystems Engineering and Soil Science

John Buchanan was promoted to professor.

Julie Carrier, professor and department head, received the 2023 James R. and Karen A. Gilley Academic Leadership award for outstanding leadership from the American Society of Agricultural and Biological Engineers (ASABE).

Lori Duncan, assistant professor, was named 2023 Cotton Researcher of the Year for her continuous work in sustainability, which includes implementation of the Field Print Calculator, establishment of the use cover crops, construction of wetlands, promotion of sustainable cotton production in the US, and investigation of soil compaction in Mid-South no-till cotton production.

Shawn Hawkins and **Forbes Walker**, both professors, received the 2023 Governor's Environmental Stewardship Award in the Environmental Education and Outreach Category. The Awards are presented annually to recognize outstanding achievements by individuals, businesses, organizations, educational institutions, and agencies for successful environmental projects and conservation measures.

Sindhu Jagadamma, associate professor, won the 2023 Graduate Student Senate's graduate student mentor award and received the AgResearch Mid-career Faculty Research Excellence Award.

Sandra Marine, administrative support assistant III, received the UT AgResearch Dean's Award for Outstanding Support Staff.

Samuel Okai, grad research assistant, who is mentored by Nutifafa Adotey, placed first in the MS category of the TAPA (Tennessee Agricultural Production Association) Grad Student Competition with the poster, *Soil Property Effects on Ammonia Volatilization from Urea and Urea Ammonium Nitrate*.

Sean Schaeffer was promoted to professor.

Al Womac, professor, was recognized at the Annual International Meeting of the American Society of Agricultural and Biological Engineers with the Superior Paper award for, *Status of Spray Penetration and Deposition in Dense Field Crop Canopies*, coauthored with Erdal Ozkan, Heping Zhu, John Kochendorfer, and Hongyoung Jeon.

Wesley Wright, senior research associate, received the UT AgResearch Dean's Award for Outstanding Professional Staff.

Joe Zhuang, professor, received tenure.

Department of Entomology and Plant Pathology

Ernest Bernard was named the 2023 Institute Professor, UTIA's highest honor.

Kimberly Gwinn was promoted to professor.

Autumn McLaughlin, PhD candidate, was selected as one of five students to participate in the 2023 I.E. Melhus Graduate Student Symposium and as one of two recipients of the National Corn Growers Association (NCGA) graduate student scholarship.

Zane Smith, a first-year PhD student, received a National Science Foundation Graduate Research Fellowship. The oldest graduate fellowship of its kind, the NSF Graduate Research Fellowship Program supports outstanding graduate students in science, technology, engineering, and mathematics fields and ensures the quality, vitality, and diversity of the scientific and engineering workforce of the United States. His research is focused on the conservation of imperiled and endangered forest trees, primarily native ash trees in Great Smoky Mountains National Park.

Meg Staton, associate professor, and Joe Zhuang, professor, are 2023-2024 cohort members of the UT Office of Research, Innovation and Economic Development Expanding Horizons program

Mark Windham, professor emeritus, was awarded the Joseph and Marion Klima Medal at the 2023 ARS National Rose Convention in Shreveport, Louisiana.

Department of Food Science

Scott Lenaghan, associate professor, received the UT AgResearch Dean's Grantsmanship Award.

Toni Wang, institute professor, became a member of the American Oil Chemists' Society board. Wang also received the Society's Protein and Co-Products (PCP) Division's 2023 ADM Best Paper Award for *Utilization of dairy beta stream to produce phospholipids products by salt precipitation and solvent fractionation*.

David White, professor and interim dean of the Herbert College of Agriculture, served as a consultant on the American Society for Microbiology policy paper on recommendations to combat the global crisis of antimicrobial resistance and an invited expert on the organization's July 12 webinar "Pathways to Progress Against Antimicrobial Resistance." He also continued to serve as a voting member of the Presidential Advisory Council on Combating Antibiotic-Resistant Bacteria.

Gixin Zhong, professor, was selected as an IFT (Institute of Food Technologies) Fellow.

Department of Plant Sciences

Hunter Hammock, PhD student, was awarded the Extraordinary Campus Leadership and Service Award by UT Knoxville.

Tarek Hewezi, professor, received the AgResearch Impact Award.

Kellie Walters, assistant professor, was invited to be part of an educational model on temperature control systems in the 2023 Virtual Climate Control Short Course by the Greenhouse Lighting and Systems Engineering international organization.

Ravi Neelipally, PhD student, received the 2023 Southern Sustainable Agriculture Research and Education (SARE) Graduate Student Research Grant for his work on determining the viability of organic wheat-soybean double-crop systems in the southeastern United States.

John Sorochan, distinguished professor, presided over the general session of the 2023 Sports Field Managers Association conference. The group presented the preparations for research and the undertakings required to present the 2026 World Cup in the Americas.

Larry Steckel, professor, was recognized as a Fellow by the Southern Weed Science Society of America.

Virginia Sykes was promoted to associate professor with tenure.

UT AgResearch Administration

Blake Brown, director of the UT AgResearch and Education Center at Milan, was recognized for his 2022-2023 service as president of the Research Center Administrator's Society.

Walt Hitch, director of the Plateau AgResearch and Education Center in Crossville, served as the treasurer of Research Center Administrator's Society.

Darcy Smith, project manager, received the J.E. Moss Achievement Award.

Hongwei Xin, dean of UT AgResearch, received the 2023 LeggACY Maker Award for his commitment and achievements in advancing the egg industry and the mission of the Egg Industry Center.

School of Natural Resources

Allan Houston, professor, was named the 2023 Forest Conservationist of the Year by the Tennessee Wildlife Federation.

Neelam Poudyal, professor, received the UT AgResearch Dean's Grantsmanship Award.

Emma Willcox was promoted to professor.



Windham Recognized for Role in Rose Research and Education

Mark Windham, professor emeritus of plant pathology, was awarded the Joseph and Marion Klima Medal for Excellence in Rose Education by the American Rose Society. The award recognizes Windham's research in the field of ornamental plant pathology, his contributions to the American Rose Magazine and his national outreach to rosarians on the topics of plant health, disease prevention, pest control and more. Throughout his thirty year career, Windham has presented more than 150 rose talks at American Rose Society conventions and district meetings and to local rose societies.

Though retired from UT, Windham continues his labors to study the beloved plant and diseases that affect it. He is currently a co principal investigator of a \$4.3 million USDA National Institute of Food and Agriculture Specialty Crop Research Initiative grant for developing sustainable roses and has more than 3,000 roses planted for research and education purposes as well as an active laboratory at the UT Plateau AgResearch and Education Center in Crossville.

2023 NEW FACULTY AND LEADERSHIP HIRES



Chetan Badgujar

- Assistant Professor
- Department of Biosystems Engineering and Soil Science
- 65 percent research/35 percent teaching
- Mechatronics; Artificial Intelligence



Le Chen

- Assistant Professor
- Department of Agricultural and Resource Economics
- 75 percent research/25 percent teaching
- Economics of Sustainable Agricultural Production



Blair Downey

- Assistant Professor
- Department of Animal Science
- 85 percent research/15 percent teaching
- Animal Behavior and Welfare



Emine Fidan

- Assistant Professor
- Department of Biosystems Engineering and Soil Science
- 65 percent research/35 percent teaching
- Water Resources; Data Science and Modeling; R and GIS Softwares



Tabibul Islam

- Assistant Professor
- Department of Plant Sciences
- 75 percent research/25 percent teaching
- Fruit Production in Controlled Environments



Bill Jackson

- Human Resources Director
- UTIA
- 100 percent administration



Amanda May

- Research Assistant Professor
- Center for Renewable Carbon
- 100 percent research
- Sustainable Bioeconomy Systems



Alejandro Molina-Moctezuma

- Research Assistant Professor of Fisheries
- School of Natural Resources
- 60 percent research/40 percent teaching
- Movement and Survival of Fish; Conservation and Management of Fisheries



Alessandro Occhialini

- Assistant Professor
- Department of Plant Sciences
- 85 percent research/15 percent teaching
- Gene Editing



Bruno C. Pedreira

- Associate Professor and Director
- Department of Plant Sciences/UT Beef and Forage Center
- 10 percent research/90 percent extension
- Forage Production and Management

2023 NEW FACULTY AND LEADERSHIP HIRES



Alex Pfotenhauer

- Research Assistant Professor
- UTIA/Center for Agricultural Synthetic Biology
- 100 percent research
- Synthetic Biology; Genome Editing; Biotechnology; Molecular Biology



Gabriela Perez-Quesada

- Assistant Professor
- Department of Agricultural and Resource Economics
- 75 percent research/25 percent teaching
- Environmental and Resource Economics; Production Economics and Applied Economics



Taylor Ruth

- Assistant Professor
- Department of Agricultural Leadership, Education and Communications
- 70 percent research/30 percent teaching
- Agricultural and Natural Resources Science Communication



Ryan Sharp

- Associate Professor
- School of Natural Resources
- 25 percent research/40 percent teaching/35 percent extension
- Outdoor Recreation



Elizabeth Shepherd

- Assistant Professor
- Department of Animal Science
- 85 percent research/15 percent teaching
- Animal Immunology and Health



Aaron Staples

- Assistant Professor
- Department of Agricultural and Resource Economics
- 75 percent research/25 percent teaching
- Consumer Marketing and Demand



Lu Wang

- Assistant Professor
- School of Natural Resources/Center for Renewable Carbon
- 95 percent research/5 percent teaching
- Low Carbon Cellulosic Materials



Blake Whitman

- Assistant Professor
- Department of Biosystems Engineering and Soil Science
- 25 percent research/75 percent teaching
- Construction Science Management



Hannah Wright

- Stakeholder Community Engagement Director
- UTIA
- 100 percent administration



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