19-Strong
1890 LAND GRANT UNIVERSITIES

THE 1890 VOICE

Where Innovation Drives Impact

2026 1890 LAND-GRANT UNIVERSITIES IMPACT REPORT

The 1890 Voice: Where Innovation Drives Impact

Established under the Second Morrill Act of 1890, 19 historically Black land-grant universities in the United States drive change in rural and urban communities. Through research-based programs, they give students, farmers and families the tools to create lasting impact.

With support from partners such as the Association of Extension Administrators, Association of 1890 Research Directors, Council of 1890 Deans of Agriculture and the U.S. Department of Agriculture/1890 Task Force, these universities advance Cooperative Extension, agricultural research and education.

Funding from USDA's National Institute of Food and Agriculture, along with state and congressional support, powers programs that strengthen agriculture, youth development and community well-being.

This annual publication, produced by the 1890 Land-grant Communications Committee, highlights just a portion of the work shaping tomorrow's leaders and innovators.

Learn more at *www.1890aea.org* or *wwwcp.umes.edu/ard*.

1890 Land-grant Universities

- Alabama Agricultural and Mechanical University
- Alcorn State University
- Central State University
- Delaware State University
- Florida Agricultural and Mechanical University
- Fort Valley State University
- Kentucky State University
- Langston University
- Lincoln University
- North Carolina Agricultural and Technical State University
- Prairie View Agricultural and Mechanical University
- South Carolina State University
- Southern University and Agricultural and Mechanical College
- Tennessee State University
- Tuskegee University
- University of Arkansas at Pine Bluff
- University of Maryland Eastern Shore
- Virginia State University
- West Virginia State University

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AEA Association of Extension Administrators 1890 Land-Grant Universities

USDA National Institute of Food and Agriculture
U.S. Department of Agriculture

Alabama Agricultural and Mechanical University

Daivon Allen truly embodies the Alabama A&M University promise: Start at AAMU and Go Anywhere.

Start at AAMU, Go Anywhere

Daivon Allen is fortunate, but his success is grounded in discipline, hard work and a passion for agriculture. With a degree in animal science, he is advancing agricultural research while building a strong network with producers and consumers across North Alabama.

Allen was among the first students mentored by Dr. Valens Niyigena, a former animal science specialist with the Alabama Cooperative Extension System (Alabama Extension) at Alabama A&M University (AAMU). Niyigena developed a program to equip undergraduates with essential skills in animal care and farm management. Drawing on his agricultural background and love for goats, Allen earned the role of lead goat technician with Alabama Extension at AAMU.

Today, he works under the guidance of Extension Animal Scientist and Veterinarian Dr. Felix Samuel and was promoted to Extension agent in August 2025. Under Samuel's mentorship, Allen has deepened his knowledge of small ruminant health, including physiology and reproduction, while also learning what it takes to design and support effective Extension programming. He is particularly proud to apply what he learned to advance small ruminant research and assist local producers.

Allen graduated from AAMU in December 2025. He will commission as a second lieutenant in the National Guard of the United States, serving stateside. He also looks forward to continuing his work with Samuel's team to expand AAMU Extension's animal science program.

FUNDING: U.S. DEPARTMENT OF AGRICULTURE
└ AGRICULTURAL SYSTEMS & TECHNOLOGY

Strengthening Alabama's Small Ruminant Farmers

The Alabama Goat and Sheep Summit is held annually in North Alabama under the leadership of the animal science team at Alabama Cooperative Extension System, Alabama A&M University. The event brings together farmers, producers, students, researchers and agricultural professionals to tackle pressing issues in small ruminant production. It also features the latest advancements and strategies for sustainable farming.

Small ruminant farmers in Alabama face numerous challenges, including limited access to modern management practices, as well as the following:

- Increasing parasite resistance.
- High prevalence of gastrointestinal parasites, such as *Haemonchus contortus*.
- Impacts of weather-related factors on forage availability.
- Limited sustainable practice.
- Youth disengagement.

Additionally, farmers often lack opportunities for networking and sharing knowledge with peers and experts, which can stifle innovation and productivity. These challenges contribute to reduced profitability and sustainability for goat and sheep producers in the state.

The Alabama Sheep and Goat Summit helps producers to get on the right track by offering educational presentations and hands-on training by Cooperative Extension and other experts across the nation. It also allows youth to engage in interactive sessions to foster an interest in agricultural careers.

Small ruminant producers leave the event with practical tools and hands-on experience to improve farm productivity and profitability.

Dr. Felix Samuel with small ruminant producers during the Alabama Goat and Sheep Summit.

FUNDING: U.S. DEPARTMENT OF AGRICULTURE'S NATIONAL INSTITUTE OF FOOD AND AGRICULTURE
└ AGRICULTURAL SYSTEMS & TECHNOLOGY

Exploring How Cells Make, Store Fat

Dr. Stylianos Fakas, researcher and associate professor of food biotechnology at Alabama A&M University.

Dr. Stylianos Fakas, a researcher and associate professor of food biotechnology at Alabama A&M University (AAMU), and his research team aim to understand how cells create and store lipids — fats that are essential for life, energy and health.

Lipids are not only structural components of cell membranes but also serve as energy reserves and sources of bioactive molecules.

To uncover the secrets of lipid metabolism, the team uses Yarrowia lipolytica, an oleaginous yeast widely recognized as a model organism for studying lipid synthesis and storage in eukaryotic cells. The research focuses on two critical enzymes that act like traffic controllers inside the cell: ATP citrate lyase (Acl1/Acl2) and phosphatidate phosphatase (Pah1). ATP citrate lyase generates acetyl-CoA, the key building block for fatty acids and sterols, while Pah1 determines whether molecules are directed toward forming cell membranes or stored as energy-rich triacylglycerols.

By combining genetics, biochemistry and advanced multiomic approaches, AAMU's Food Biotechnology Lab investigates how enzyme structure, regulation and metabolic context influence lipid biosynthesis. Understanding lipid metabolism could enable the development of sustainable oils for food and cosmetics, improve nutritional profiles through healthier lipid formulations and even support renewable energy production.

> "Bioactive lipids derived from these processes may offer health benefits such as reducing inflammation and supporting cardiovascular wellness.

Additionally, bioactive lipids derived from these processes may offer health benefits such as reducing inflammation and supporting cardiovascular wellness.

Beyond research, Fakas currently supervises five graduate students and has guided six others to successful degree completion, ensuring that future scientists are prepared to address global challenges in health, biotechnology and sustainability.

FUNDING: NATIONAL SCIENCE FOUNDATION; U.S. DEPARTMENT OF AGRICULTURE
└ AGRICULTURAL SYSTEMS & TECHNOLOGY

ALABAMA A&M UNIVERSITY

Alcorn State University

Exploring the Future of Agriculture: CAAS Students Travel to Puerto Rico for Tropical Learning Experience

Each year, the United States Department of Agriculture (USDA) advances real-world learning through immersive programs that extend beyond traditional classroom settings. In the summer of 2025, this commitment expanded through a two-week agricultural experience in Puerto Rico that brought experiential education to life.

A total of 25 participants, including 11 faculty and staff, took part in the program, representing Alcorn State University, Alabama Agricultural and Mechanical University and the University of Puerto Rico at Mayagüez. Together, they explored the island through a series of immersive, field-based learning experiences.

Students participate in a dairy production workshop at the University of Puerto Rico Dairy Farm.

The program introduced participants to tropical farming systems, value-added food production and region-specific agricultural practices shaped by weather, culture and sustainability needs. Students gained firsthand exposure to tropical ecosystems and examined how environmental conditions and local traditions influence agricultural decision-making.

Hands-on demonstrations included goat and dairy processing, honey harvesting and hydroponic production systems. Site visits to Finca Montaña, Frutos del Guacabo, Hacienda San Pedro and Apiario Puente Real offered practical insights into livestock management, specialty crop production and innovative agricultural technologies.

Through collaboration with peers from multiple institutions, participants compared diverse agricultural approaches, strengthening leadership, critical thinking and problem-solving skills. These shared experiences also fostered dialogue around global challenges such as food security and sustainable development.

Overall, the program reflects the USDA's mission to prepare future agricultural leaders with the

knowledge, perspective and practical experience needed to support resilient and sustainable food systems in an increasingly complex world.

FUNDING: U.S. DEPARTMENT OF AGRICULTURE'S NATIONAL INSTITUTE OF FOOD AND AGRICULTURE
- AGRICULTURAL SYSTEMS & TECHNOLOGY
- ENVIRONMENTAL STEWARDSHIP
- FOOD SECURITY
- NUTRITION & HEALTH
- ENERGY & BIOPRODUCTS

ASEP Launches First Ag is Lit Agricultural Literacy School Tour

The Alcorn State University Extension Program (ASUEP) – Institute for 4-H Youth Development launched its first Ag is Lit Agricultural Literacy School Tour. This mobile, hands-on initiative is designed to help elementary students understand agriculture and other science, technology, engineering and mathematics (STEM) subjects, as well as the role these areas play in their daily lives.

Offered at no cost to schools, the tour delivered structured, interactive lessons that made agriculture accessible and engaging for young learners. During its inaugural run, Ag is Lit reached nearly 530 students. Each class rotated through six themed stations connecting agriculture to daily life. Activities included tracing product origins, preparing snacks, interacting with farm animals, observing drone technology and practicing health and hygiene.

The stations — Farm to Snack, Meet the Farm Friends, The Great Ag Source Challenge Relay, Tasty Ag Traditions, Ag Tech in the Sky and Handwashing & Health — were designed to build agricultural awareness in a fun, age-appropriate way. Students discovered how agriculture impacts their food, clothing and surroundings.

Teachers reported increased interest and stronger understanding of agriculture-related concepts after the tour. Many students demonstrated a greater curiosity about STEM fields, healthier food choices and the connection between agriculture and their everyday routines. The success of the inaugural Ag is Lit tour highlights the importance of early agricultural literacy and hands-on learning opportunities for Mississippi youth.

ASUEP plans to expand the tour to additional schools and counties, continuing its commitment to delivering meaningful educational experiences that help students recognize the importance of agriculture in their lives and communities.

FUNDING: U.S. DEPARTMENT OF AGRICULTURE'S NATIONAL INSTITUTE OF FOOD AND AGRICULTURE
- YOUTHS, FAMILIES & COMMUNITIES

Students gather around as Alcorn State University Extension educators lead an energetic nutrition and agriculture activity.

Graduate Student's Research Expected to Boost Mississippi Watermelon Yields

Graduate student TreDarious Clifton is enhancing sustainable agriculture by merging research with real-world applications. His thesis project has developed into a model for improving crop productivity, restoring pollinator habitats and fostering long-term resilience in southern farms.

Clifton's study examines how adding pollinator-friendly plants to watermelon fields can enhance biodiversity and increase crop yield. With the decline of pollinators due to pesticide use, habitat loss and other stressors, this research addresses a significant challenge that impacts two-thirds of global crops and millions of acres of U.S. farmland.

Clifton's research, conducted at the Alcorn State University (ASU) Model Farm and the Alcorn Experiment Station, employed a Randomized Complete Block Design to compare traditional watermelon plots with intercropped plots. He interplanted four varieties of watermelon with flowering species. The results were clear: intercropped fields attracted significantly more pollinators and produced higher fruit yields compared to monocrop fields.

A bee gathers pollen from a sunflower growing in TreDarious Clifton's intercropped research plots.

Beyond the statistics, Clifton's findings offer a practical, low-cost strategy for small and mid-sized farmers looking to improve production while supporting environmental health. By demonstrating that simple habitat enhancements can boost pollination activity and crop performance, his work provides a roadmap for sustainable farming practices that benefit both growers and ecosystems.

Clifton's research emphasizes the vital role that pollinators play in agricultural success and highlights the power of student-led innovation at ASU. His project shows that sustainability and productivity can go hand in hand, helping farms thrive today while protecting the ecosystems needed for tomorrow.

FUNDING: U.S. DEPARTMENT OF AGRICULTURE'S NATIONAL INSTITUTE OF FOOD AND AGRICULTURE
└ AGRICULTURAL SYSTEMS & TECHNOLOGY

Alcorn State University

Central State University

Rising Senior Royalty Hightower Champions Sustainability Through Research

Royalty Hightower conducts particle size analysis research at National Soil Erosion Research Laboratory.

Royalty Hightower, a junior at Central State University majoring in sustainable agriculture, exemplifies the next generation of agricultural leaders. As a dedicated 1890 David Scott Scholar, she has engaged in impactful research under the mentorship of Dr. Sakthi Kumaran, research associate professor of soil science and agronomy, including presenting her work at the 2024 Association of 1890 Research Directors Symposium in Nashville, Tennessee.

In the summer of 2024, Hightower conducted undergraduate research at the National Soil Erosion Research Laboratory, where she examined the effects of land management on organic carbon soil and runoff in Midwestern croplands. Her hands-on research included algae and water sampling, particle analysis using the Malvern Mastersizer 3000 and organizing data from rainfall simulations — advancing erosion science and sustainable land-use practices.

Hightower has shared her findings at multiple research symposiums, including at Purdue University. Committed to environmental stewardship and equity in agriculture, she aspires to develop sustainable, economically sound solutions that address global agricultural challenges and ensure a healthier planet for future generations.

FUNDING: 1890 DAVID SCOTT SCHOLAR
└ AGRICULTURAL SYSTEMS & TECHNOLOGY

Fast Track Farming Plants Seeds of Resilience, Economic Growth

Toledo, Ohio, is a vibrant city with a rich history. Yet, it faces persistent economic and food access challenges. It has a high poverty rate of 24.5%, and many neighborhoods are food deserts.

Central State University Extension addresses these issues through its Fast Track Farming program, where participants gain hands-on training in growing, managing, harvesting and processing crops, as well as planning, managing, marketing and funding their agribusinesses.

Since its inception in 2022, the program has trained 53 urban farmers, including I C Equality Farm, founded by a first-generation urban farmer, Alonzo Garrett. As a participant in the program, Garrett was connected to a network of growers, enrolled in the 2501 Grant program for continuing education, joined the Farmer Veteran Coalition and established a profile on Food Market Maker — an app connecting farmers and buyers.

The educators worked with Garrett for three years, helping him advance from a garage aquaponics hobbyist to a successful microgreens agribusiness entrepreneur. The program connected him with Urban Wholistic, another urban farm, which recruited him to teach aquaponics at a local school.

According to Garrett, “I C Equality Farm is proof that with training, perseverance and community support, an idea that started in a garage can grow into a thriving urban farm. This program can transform lives, strengthen neighborhoods and create a model of resilience and food equity in Toledo.”

Fast Track Farming participants are reshaping the food landscape by improving nutrition and generating new income in historically disinvested neighborhoods.

Alonzo Garrett, owner of I C Equality Farm, carefully nurtures trays of vibrant microgreens.

> “With training, perseverance and community support, an idea that started in a garage can grow into a thriving urban farm."

FUNDING: U.S. DEPARTMENT OF AGRICULTURE'S NATIONAL INSTITUTE OF FOOD AND AGRICULTURE 1890 EXTENSION CAPACITY BUILDING GRANT

- FOOD SECURITY
- AGRICULTURAL SYSTEMS & TECHNOLOGY
- ENVIRONMENTAL STEWARDSHIP

Bee Strong: Breeding Resilient Pollinators for a Healthier Future

Pollinators are the backbone of global food production and ecosystem health, yet they face unprecedented threats from pesticides, habitat loss and disease. Honeybees, the world's primary managed pollinators, are not only essential for crop yields but also serve as key models for understanding social behavior and stress resilience.

To combat the pollinator crisis, a Central State University (CSU) research team launched an ambitious effort to strengthen honeybee defenses against Varroa destructor, one of the most destructive parasites in beekeeping. Through selective breeding, they developed honeybee stocks with enhanced grooming and mite-biting traits, producing new breeder queens via instrumental insemination and natural mating.

Innovation didn't stop at genetics. The team created advanced imaging tools and a smartphone app that helps beekeepers identify resistant colonies with more than 90% accuracy, bringing artificial intelligence-powered monitoring directly to the field.

Field studies revealed that feral honeybees in Ohio and Kentucky exhibit 34% to 49% higher mite-biting behavior than commercial bees, showcasing natural resilience. MicroCT scans uncovered mandible shape differences linked to defense, offering new insights into morphological adaptations.

Beyond honeybees, the CSU researchers advanced molecular resources for wild pollinators by identifying stable reference genes in the small carpenter bee (Ceratina calcarata), a native species critical for pollinating fruits, vegetables and biofuel crops. This breakthrough supports future gene-expression studies and strengthens complementary pollination services.

A student measures the size of a Varroa mite under a dissecting microscope.

By merging genetics, technology and ecology, CSU is building a future where pollinators and the food systems they sustain can thrive.

FUNDING: EVANS-ALLEN
└ FOOD SECURITY

CENTRAL STATE UNIVERSITY

Delaware State University

Advancing Resilient Living Through Delaware State University Students

Delaware State University's Introduction to Environmental Sciences course has shaped sustainability leaders since 2005. Offered annually as a core requirement for natural resources majors and an elective for other disciplines, the course combines experiential learning with real-world case studies. To date, more than 500 students have completed the program, with class sizes ranging from 15 to 30 each spring.

The course addresses environmental issues at local, national and global levels, emphasizing practical solutions. Students gain hands-on experience in the lab and connect classroom concepts to real-world applications through field trips to wetlands, coastal habitats, state parks and university farms. These experiences deepen understanding of ecosystem dynamics and conservation practices.

Interactive projects challenge students to think critically and creatively. From designing ecotourism proposals to planning community parks, students learn to advocate for sustainable development while considering ecological and social impacts. Case studies mirror real-life decision-making, preparing students for careers in environmental stewardship.

Beyond academics, students participate in Earth and Arbor Week celebrations, contributing nearly 10 hours of community service annually. These activities foster civic engagement and reinforce the importance of sustainability in everyday life.

In spring 2025, the course achieved a milestone – every student passed, with most earning A's and B's. This success underscores the program's impact in cultivating knowledgeable, engaged professionals ready to address global environmental challenges.

FUNDING: DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES
└ ENVIRONMENTAL STEWARDSHIP

Students engage in Earth and Arbor Week activities.

Farm School Strengthens Delaware Agriculture

Participants dive into hands-on learning during DSU Farm School's high tunnel session.

The Delaware State University (DSU) Farm School project has made a significant and lasting impact on Delaware's small and beginning farmers, including veterans by delivering comprehensive agricultural education, technical assistance and hands-on training. Through targeted outreach, the program has effectively empowered participants with the skills and resources to establish and sustain successful farm enterprises that contribute to the state's agricultural strength.

This project has impacted more than 165 participants through well-structured workshops, field days and personalized mentorship, resulting in the establishment of more than 17 new farm operations. This growth not only diversified Delaware's agricultural landscape but also enhanced food security in limited-resource communities by equipping individuals with training in crucial areas such as farm planning, marketing, financial management and innovative practices like aquaponics, cultivation of ethnic crops, poultry farming and meat goat production.

The DSU Farm School has been instrumental in enhancing access to vital United States Department of Agriculture programs, with 26 participants successfully enrolling in initiatives such as the Environmental Quality Incentives Program and Farm Service Agency. These efforts have bolstered participants' economic viability, ensuring the adoption of sustainable farming practices that benefit not only individual growers but also the broader Delaware economy.

The DSU Farm School has advanced agricultural knowledge while fostering resilience, economic growth and community cohesion, leaving a profound legacy on Delaware's agricultural industry. Its innovative approach continues to transform lives, cultivate new opportunities and build a more equitable and sustainable future for agriculture in the state.

FUNDING: STATE OF DELAWARE
AGRICULTURAL SYSTEMS & TECHNOLOGY

Biochar Research Advances Soil Health, Sustainable Farming

Sustainable agriculture depends on healthy soil that functions as a living ecosystem to support plants, animals and humans. Biochar has shown promise as a soil amendment that enhances soil health and plant growth while promoting carbon sequestration. Effective application programs are needed to secure these agricultural and environmental benefits in field practices.

Researchers at Delaware State University have conducted extensive studies to develop effective biochar application programs for improving soil health and advancing sustainable agriculture. Field plots were established at the university's research farm in 2008 with nine treatments using different biochars incorporated into the top 20 centimeters of soil at varying rates, combined with reduced annual chemical fertilization. Crops such as corn (Zea mays) and soybeans (Glycine max) were grown in rotation. Crop growth and grain yield have been measured seasonally, and soil health properties have been evaluated regularly.

The biochar-amended plots serve as a site for research, outreach and student training. Researchers have collected, analyzed and shared extensive data on biochar, soil health and crop production through publications and professional meetings.

This research has had lasting impacts by preparing agricultural professionals for sustainable farming and promoting effective soil health management techniques.

FUNDING: U.S. DEPARTMENT OF AGRICULTURE CAPACITY BUILDING GRANT

- AGRICULTURAL SYSTEMS & TECHNOLOGY
- ENVIRONMENTAL STEWARDSHIP

Graduate student Olaniyi Adewumi conducts field plot experiments to investigate the effects of diverse biochar amendments on soil health and crop productivity.

DSU
It All Matters.

Florida A&M University

FAMU Extension Cultivates Urban Sustainability

Florida A&M University (FAMU) Cooperative Extension, in partnership with the city of West Palm Beach, is transforming how urban communities think about food, the environment and collective well-being by planting seeds of sustainability.

The FAMU Extension Urban Agriculture Program has worked to establish and support community gardens in the Pleasant City and Coleman Park neighborhoods in the city of West Palm Beach. These gardens serve as living classrooms where residents of all ages learn to grow fresh produce, practice composting, adopt sustainable food habits and harvest fresh produce to complement home meals.

As a result, these communities learn to feed themselves while reconnecting people to the land in urban spaces. The gardens also provide families access to fresh, healthy foods while building community pride and environmental stewardship. In addition, hands-on workshops engage residents and youth by empowering them to take ownership of their food systems and contribute to the goals of reducing food insecurity and waste.

To date, the program has reached 1,700 residents through gardening, composting and environmental workshops. Twelve hundred pounds of produce were grown, and 10 residents started their own backyard gardens. In addition, the program collaborated with schools, community centers, churches and community organizations, including youth-led projects that advance student leadership in environmental resilience and waste reduction.

Pair displays freshly harvested produce.

Today, as intergenerational learning spaces, first graders plant seeds and older adults share traditional growing techniques, connecting education with lived experience. The program integrates science, technology, engineering and mathematics (STEM) concepts, nutrition education and environmental awareness into every activity, making sustainability accessible and relevant.

FUNDING: U.S. DEPARTMENT OF AGRICULTURE 1890 EXTENSION CAPACITY BUILDING PROGRAM

- AGRICULTURAL SYSTEMS & TECHNOLOGY
- FOOD SECURITY
- NUTRITION & HEALTH
- YOUTHS, FAMILIES & COMMUNITIES

Growing a Better Grape

The southern muscadine, a bronze-to-purple grape, often ranks low in consumer preference compared to bunch grapes because of its thick skin, large seeds and short wine shelf life. Researchers at Florida A&M University's Center for Viticulture and Small Fruit Research are working to improve its quality and expand its market potential.

"Bunch grapes can't be grown in this area because of a bacterial disease that kills the plant," said Mehboob Sheikh, Ph.D., professor and center program leader. "The only grapes we can grow are the local domesticated grapes, the muscadines."

Established in 1978, the internationally recognized center leads muscadine research in the United States and holds three patents for native grape varieties. Under the direction of Violeta Tsolova, Ph.D., the team is advancing innovative breeding efforts.

"We are the first in the nation to create the whole genome sequence for muscadine grapes," said Islam El-Sharkawy, Ph.D., associate professor of grape breeding and fruit crop production. "Using gene-editing technology, we interrupted the genes that are responsible for seed formation."

The breakthrough could lead to seedless muscadines and improved skin texture.

Dr. Islam El-Sharkawy and the farm manager inspect muscadine grapes in the vineyard.

> "Muscadines contain phyto-chemicals shown to help combat obesity, aging and some cancers.

Researchers are also developing longer-lasting muscadine wine.

Health benefits add another dimension. Muscadines contain phytochemicals shown to help combat obesity, aging and some cancers. Nearly 20 muscadine-based supplements have been created and tested with consumers.

"Customers really like them and want to buy them," Sheikh said.

Ultimately, expanding muscadine uses will support farmers and boost profitability. "The goal is to make it more distinct and more profitable for the industry," Sheikh said.

FUNDING: OTHER
- AGRICULTURAL SYSTEMS & TECHNOLOGY
- FOOD SECURITY

FAMU FLORIDA AGRICULTURAL AND MECHANICAL UNIVERSITY

Fort Valley State University

Building Georgia's Animal Health Workforce

Animal health is critical to Georgia's agriculture industry, national food safety and disease prevention. Fort Valley State University (FVSU) strengthens this sector by preparing students for careers in veterinary medicine, research and animal care through its animal science program.

The program offers hands-on training, undergraduate research and professional development. Students gain practical skills through coursework, internships and leadership opportunities, ensuring they are ready to contribute to animal health and public safety.

Destiny Absher, a 2025 FVSU graduate, exemplifies this impact. With guidance from faculty mentors and a strong academic foundation, Absher completed competitive internships at the National Centers for Animal Health in Ames, Iowa. There, she cared for cattle, sheep, horses and fawns; administered treatments and vaccinations; and assisted with research on livestock disease detection. She also honed organizational and communication skills while supporting facility operations.

Destiny Absher, a 2025 Fort Valley State University graduate, aspires to become a veterinarian.

On campus, Absher expanded her leadership through student organizations and outreach initiatives. Her efforts inspired at least seven high school students from her alma mater to enroll at FVSU and pursue agriculture majors. A first-generation college graduate, Absher credits FVSU for equipping her with the confidence and expertise to pursue veterinary research with the U.S. Department of Agriculture and ultimately attend veterinary school.

Through alumni like Absher, FVSU's animal science program builds a skilled workforce that advances animal disease prevention, agricultural sustainability and public health while inspiring the next generation to explore careers in agriculture.

FUNDING: U.S. DEPARTMENT OF AGRICULTURE 1890 NATIONAL SCHOLARS PROGRAM
- AGRICULTURAL SYSTEMS & TECHNOLOGY
- YOUTHS, FAMILIES & COMMUNITIES

Connecting Rural Communities Through Digital Opportunities

Reliable broadband and digital tools remain limited in many rural areas, creating barriers to education, employment, health care and community engagement. In Georgia, communities near Fort Valley State University (FVSU) lack sufficient access to technology resources, making it challenging for residents to fully participate in an increasingly digital society.

In response, FVSU's Cooperative Extension launched a regional digital access and literacy initiative to strengthen connectivity and provide technology education across three counties in middle Georgia. The effort included partnerships with libraries, community centers, local governments and youth programs. The initiative focused on improving public access to devices, expanding computer lab availability, establishing community Wi-Fi zones and offering training for residents of all ages. Senior technology programs, community workshops, student-led technology support and public digital learning events were created to address needs identified across the tri-county area.

This initiative has significantly expanded digital opportunities by providing more than 700 devices and pieces of hardware to community members and organizations. This includes 650 Chromebooks, 31 all-in-one desktop computers, multiple 75-inch smart televisions for public learning spaces, and laptops and tablets for 14 student workers serving as technology navigators.

Six programs have been created or expanded, including senior technology instruction, community tech education at multiple libraries, student navigator support, specialized workforce training workshops and a multi-session Digital Empowerment Series. Additional upcoming efforts include expanded senior programs and a high school coding camp.

Together, these programs boost digital literacy, strengthen community services and expand technology access for residents of all ages. Community partners demonstrated strong engagement and a commitment to sustaining these services.

Community members learn to navigate online with confidence.

FUNDING: U.S. DEPARTMENT OF COMMERCE'S NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION

└ YOUTHS, FAMILIES & COMMUNITIES

Enhancing Pecan Safety Across Georgia

Pecans are an important part of Georgia's tree nut industry and a major economic crop in the United States. However, rising reports of foodborne illnesses linked to low-moisture foods have increased concerns about the safety of nuts and nut-based products.

Fort Valley State University (FVSU) researchers are studying nonthermal technologies to improve pecan safety without affecting quality. Food engineering and science faculty tested pulsed ultraviolet light and essential oils, evaluating UV light's ability to reduce E. coli and the potential of energy-based methods as alternatives to thermal processing.

Researchers at Fort Valley State University use pulsed ultraviolet light to decontaminate pecans.

Collaborations with scientists focused on fruit and tree nut safety strengthened the team's ability to explore additional approaches, including cold plasma. Graduate students and research assistants contributed to lab studies and gained hands-on experience with emerging food safety technologies.

FVSU researchers demonstrated that pulsed ultraviolet light reduced microbial contamination on pecans by 99.9% within 40 seconds. The team reported that these nonthermal processes can decrease microbial load without leaving residue or damaging product quality. Cold plasma and other energy-efficient tools also showed promise as cost-effective options for nut processors.

Also, students engaged in the project advanced their research skills and transitioned to graduate programs or professional research roles.

FVSU's work provides pecan producers with practical, environmentally safe options to reduce microbial contamination while maintaining product quality. By improving safety in nut processing, this research supports consumer confidence, strengthens a major agricultural industry and helps ensure that safe, high-quality pecans remain available in the marketplace.

FUNDING: U.S. DEPARTMENT OF AGRICULTURE'S RESEARCH, EDUCATION AND ECONOMICS (NO. 440662)

- FOOD SECURITY
- AGRICULTURAL SYSTEMS & TECHNOLOGY

FORT VALLEY STATE UNIVERSITY
1895
EMPOWER *the* POSSIBLE.

Kentucky State University

Kentucky State University Students Sweep Global Agriculture, Agribusiness Competition

Two Kentucky State University student teams claimed first- and second-place honors at the 2025 Global Agriculture & Agribusiness Case Study Competition, held during the 83rd Professional Agricultural Workers Conference in Montgomery, Alabama. The international competition challenged participants to design innovative, research-based solutions for real-world challenges facing United States soybean producers and markets.

The first-place team — Godswill Ujah, Bennett Jordan, Taliyah Walker and Maryam Adeniyi — proposed "The Commodity Contract Token (CCT): A New Strategy for U.S. Soybean." Their concept uses a trust-based digital token to verify origin, handling and quality, helping producers and buyers capture value in rapidly growing traceability and quality-assurance markets.

The second-place team — Emmanuel Obielodan, Ghani Shittu, Ayodola Olatunji and Oluwafunmisho Ibiloro — focused on tariffs and trade disruptions. Their case study recommends strengthening domestic supply chains, expanding soybean processing capacity and growing biofuel markets as long-term strategies for producers navigating global volatility.

Guided by faculty mentors from agronomy, economics,

Kentucky State students sweep top two spots at 2025 PAWC event.

aquaculture, Cooperative Extension and the School of Business, students also presented oral and poster research during the conference. The sweep demonstrated how Kentucky State's 1890 land-grant programs integrate classroom learning, applied research and industry-focused problem solving to prepare graduates who can translate data into decisions for farmers, agribusinesses and communities.

FUNDING: U.S. DEPARTMENT OF AGRICULTURE'S NATIONAL INSTITUTE OF FOOD AND AGRICULTURE - AGRICULTURAL BUSINESS INNOVATION CENTER GRANT

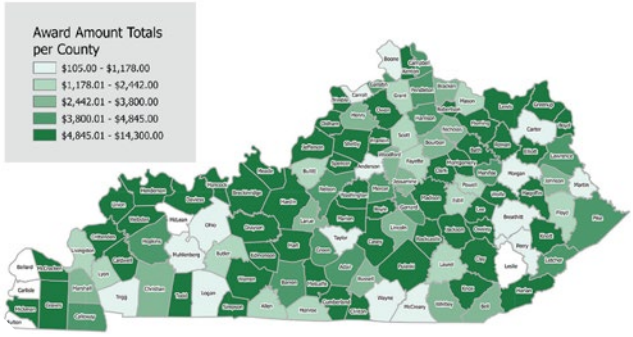
- AGRICULTURAL SYSTEMS & TECHNOLOGY
- ENERGY & BIOPRODUCTS
- FOOD SECURITY
- NUTRITION & HEALTH

Funding Boosts 1,450 Small Farms Statewide in Kentucky

Through the Center for Sustainability of Farms and Families, Kentucky State University Cooperative Extension has invested $5.06 million in 1,450 on-farm projects since 2012, reaching producers in 115 of Kentucky's 120 counties. The program helps small farmers adopt practical improvements in aquaculture, beekeeping, organic and specialty crops, agroforestry, value-added processing and farm technology.

Recent projects include indoor shrimp systems at Faul Family Riverside Farm in Henry County, value-added soap production at Positive Attraction Soaps in Lee County, diversified vegetable production at Salad Days Farm in Woodford County and infrastructure upgrades at small livestock and produce operations across the Commonwealth. These investments help families modernize equipment, expand markets and keep more Kentucky-grown products in local communities.

Building on this record, the Kentucky Agricultural Development Fund has committed an additional $1.4 million to expand education, training and mini-grants through Kentucky State. Producers may receive up to $5,000 per award, with a lifetime cap of $10,000 per farm household, plus farmer-education mini-grants of up to $500 for approved workshops and conferences.



Small-farm grants award amount totals per county.

By pairing financial assistance with technical support from Extension specialists, the program turns modest grants into lasting gains in profitability, resilience and stewardship for Kentucky's small farms, advancing the 1890 mission to strengthen rural economies and food systems.

FUNDING: KENTUCKY AGRICULTURAL DEVELOPMENT FUND

- AGRICULTURAL SYSTEMS & TECHNOLOGY
- FOOD SECURITY
- NUTRITION & HEALTH
- YOUTHS, FAMILIES & COMMUNITIES

Research to Market: Pawpaw Ale-8 Showcases Kentucky Innovation

Kentucky State University's world-leading pawpaw research program turned decades of breeding, orchard management and postharvest studies into a consumer product through a partnership with Ale-8-One, a Kentucky-based soft drink company headquartered in Winchester.

The limited-edition Pawpaw Ale-8 soft drink, developed using Kentucky State's pawpaw germplasm and expertise, introduced many Kentuckians to the native "Kentucky banana" while highlighting value-added opportunities for growers.

Within the first six weeks of distribution, Pawpaw Ale-8 surpassed all previous special summer flavors in company history, exceeding the prior sales record by 48%. The launch generated an estimated $21.32 million in advertising value equivalency through regional and national media coverage, amplifying awareness of Kentucky State's pawpaw leadership and the potential of specialty crops to drive rural economic growth.

The collaboration builds on long-term Evans-Allen–funded research that has identified superior pawpaw cultivars, improved propagation and orchard management practices, and advanced techniques to extend shelf life and processing quality. New partnerships with beverage, distilling and food companies are expanding markets for pawpaw pulp and value-added products.

By moving research from field plots to store shelves, Kentucky State is helping farmers diversify income streams, consumers discover a nutritious native fruit and Kentucky communities capture more of the economic value created by 1890 research innovation.

FUNDING: EVANS-ALLEN
└ AGRICULTURAL SYSTEMS & TECHNOLOGY

Pawpaw grown at Kentucky State University's Harold R. Benson Research & Demonstration Farm in Frankfort, Kentucky.

> "Pawpaw Ale-8 surpassed all previous special summer flavors in company history, exceeding the prior sales record by 48%.

KENTUCKY STATE UNIVERSITY

Langston University

AI Transforms Small Ruminant Science at Langston University

Langston University's Sherman Lewis School of Agriculture and Applied Sciences (SL/SAAS) is spearheading an ambitious initiative to integrate artificial intelligence (AI) into Extension education and livestock management. This effort aligns with federal priorities urging land-grant universities to expand AI capacity.

At the center of this work is De'Janique Lambeth, a senior animal science major whose field research is laying the foundation for digital tools to support Oklahoma's small ruminant producers.

Partnering with two goat farms in Oklahoma County, Lambeth is collecting extensive photo and video data across breeds and age groups to build a high-quality dataset for training a computer vision model capable of recognizing individual goats. This foundational work paves the way for automated monitoring systems that reduce labor demands while improving on-farm precision. Lambeth draws on skills gained through the competitive Research Experiences for Undergraduates (REU) program at the University of Illinois, where she trained in data collection, animal behavior and applied research.

A second research component focuses on early illness detection through video-based behavioral monitoring. Adapting methods originally developed for gestational sows, Lambeth uses BORIS software to annotate behaviors such as changes in activity, feeding patterns, breathing and social interaction. These observations will train an AI model to identify subtle indicators of disease, offering producers continuous, non-invasive health surveillance.

Student De'Janique Lambeth receives the 2025 Langston University's Sherman Lewis School of Agriculture and Applied Sciences Leadership Excellence Award.

This project exemplifies Langston University's commitment to preparing students for careers at the intersection of agriculture and emerging technologies. Lambeth's work demonstrates how student-led innovation can strengthen animal health, enhance farm sustainability and expand technological capacity across rural communities.

FUNDING: EVANS-ALLEN; U.S. DEPARTMENT OF AGRICULTURE'S NATIONAL INSTITUTE OF FOOD AND AGRICULTURE CAPACITY BUILDING GRANT; OKLAHOMA DEPARTMENT OF AGRICULTURE, FOOD AND FORESTRY

- AGRICULTURAL SYSTEMS & TECHNOLOGY
- ENERGY & BIOPRODUCTS

Langston University's Master Sewing Program Builds Community

Langston University continues to deepen its commitment to youth, families and community enrichment through the Master Sewing Program, a volunteer-led initiative launched in 2024.

Developed as part of the university's Extension mission, the program introduces young people across Oklahoma to foundational science, technology, engineering and mathematics (STEM) concepts through the art and discipline of sewing. By blending creativity with technical skill, participants explore measurement, geometry, engineering and design in a hands-on environment that is accessible and engaging. This experiential approach strengthens problem-solving skills, boosts confidence and nurtures fine motor and analytical abilities.

Annabelle Watson, master sewer, instructs volunteers in pattern cutting during class.

The program emphasizes practical life skills that encourage independence and resourcefulness. Youth learn garment construction, clothing repair and basic textile care — competencies that promote sustainability and pride in craftsmanship. Sewing also fosters communication, patience and teamwork, providing a supportive space where students can express themselves, form friendships and experience the satisfaction of bringing their ideas to life.

The Master Sewing Program has also become a meaningful source of community for its adult volunteers. Among them is Annabelle Watson, a master seamstress with more than 50 years of experience. Following the loss of her husband, she sought renewed purpose and connection. Teaching in the program has offered her "a renewed sense of community," allowing her to share her expertise while finding healing, joy and new relationships through service and mentorship.

As it grows, the Master Sewing Program exemplifies Langston University Extension's mission to unite generations, enrich families and build stronger communities. By connecting technical learning with creativity and service, the program creates lasting impact across Oklahoma.

FUNDING: U.S. DEPARTMENT OF AGRICULTURE'S NATIONAL INSTITUTE OF FOOD AND AGRICULTURE; OKLAHOMA DEPARTMENT OF AGRICULTURE, FOOD AND FORESTRY

YOUTHS, FAMILIES & COMMUNITIES

Establishing Oklahoma's First Baseline for AntiVmicrobial Resistance Genes in Livestock

Langston University is leading a statewide survey to assess anti-microbial resistance (AMR) genes in Oklahoma's livestock systems.

Researchers collected samples from multiple species on 15 farms across randomly selected counties, representing the state's major animal-agriculture regions. This effort marks one of Oklahoma's first coordinated attempts to establish baseline AMR data, laying the foundation for long-term monitoring and informed decision-making.

Laboratory testing is underway using the Ampliseq targeted bTEFAP Illumina sequencing platform to detect and characterize priority AMR genes that pose risks to animal and public health. DNA from each sample is analyzed to identify resistance determinants and measure diversity and abundance of AMR markers within and across farm types. These findings will be paired with farm-level data, such as antimicrobial use, herd or flock characteristics and manure management practices, to pinpoint environmental and management factors influencing AMR patterns.

Dr. Amlan Patra collects samples from large animal livestock at Travis Tucker Farm in Caddo County, Oklahoma.

Manure, a key reservoir for antimicrobial residues and resistant bacteria, is a potential pathway for gene spread through land application or runoff. By examining these dynamics, the survey provides timely insight into on-farm AMR risks and opportunities for improved stewardship and waste management.

Results will help producers, veterinarians, Extension educators and state agencies strengthen antimicrobial practices and reduce environmental dissemination. Ultimately, this dataset will support regional and national One Health surveillance initiatives, guiding science-based strategies to protect animal health, safeguard public health and promote sustainable agriculture in Oklahoma and beyond.

FUNDING: OKLAHOMA DEPARTMENT OF AGRICULTURE, FOOD AND FORESTRY

AGRICULTURAL SYSTEMS & TECHNOLOGY

LANGSTON UNIVERSITY

Lincoln University

NASA Grant Aims to Expand Student STEM Research Opportunities

Lincoln University of Missouri (LU) has received $103,524 as part of a highly competitive $2.5 million NASA grant to expand science, technology, engineering and mathematics (STEM) research opportunities for students while contributing to a pioneering biomanufacturing project.

The initiative addresses two national priorities — developing viable technologies for long-term space missions and strengthening the domestic STEM workforce. NASA aims to convert human waste into usable organic acids through anaerobic digestion, which can then be transformed into valuable materials such as protein-rich biomass and natural products like β-carotene.

As Missouri and the nation face critical workforce shortages in food, agriculture and technical fields, LU's involvement directly supports efforts to broaden participation in STEM, particularly among students at 1890 Land-grant Universities.

Under the leadership of principal investigator Dr. Tunsisa Hurisso, LU will focus on student development and advanced analytical research. Over the three-year grant period, two undergraduates each summer will complete hands-on training with scientists at Washington University in St. Louis, Saint Louis University and NASA's Kennedy Space Center. This experiential pipeline aims to expose students to biomanufacturing, anaerobic digestion technologies and space-related research. On campus, LU researchers will perform metabolite analyses using state-of-the-art UHPLC-MS/MS to evaluate cellular processes under space-relevant conditions.

Lincoln University student works with Dr. Tunsisa Hurisso in a science lab.

Expected outcomes include increased student engagement in STEM careers, strengthened research capacity at LU and contributions to NASA's long-term goal of developing life-supporting materials for space missions.

Early success is already evident, with an LU graduate pursuing advanced study at Washington University and contributing to the NASA project, demonstrating the transformative opportunities the grant is designed to create.

FUNDING: NASA'S SPACE BIOLOGY PROGRAM (2024-ROSES PROGRAM ELEMENT E.11 NNH24ZDA001N-CIBS)
- ENVIRONMENTAL STEWARDSHIP
- ENERGY & BIOPRODUCTS
- AGRICULTURAL SYSTEMS & TECHNOLOGY

Finca Fest Blends Flavor, Learning at Lincoln University

Across Missouri, food insecurity and limited access to fresh produce continue to challenge families, especially in urban areas. At the same time, many residents are less familiar with native plants and soil health practices that support resilient, sustainable food systems.

Lincoln University Cooperative Extension's Native and Specialty Crops Program created Finca Fest to help families and community members reconnect with the land by showing how native plants, local foods and simple gardening skills can strengthen food security and improve daily nutrition.

In October 2025, the program hosted Finca Fest at its urban Finca EcoFarm in Jefferson City. The festival transformed the site into an interactive learning space with farm tours, native-plant demonstrations, hands-on gardening stations for all ages and tastings of native and specialty crop recipes. Extension educators and community partners led demonstrations on pollinator habitat, soil health, sustainable production techniques and cultural food traditions. Each activity gave visitors practical tools they could use at home — whether planting a small garden, cooking with native produce or supporting wildlife in their yards.

> "Participants reported greater confidence in growing native plants, a better understanding of sustainable gardening and increased interest in adding nutritious foods to their meals.

Attendees sample native and specialty crops inside the greenhouse at Lincoln University's Finca EcoFarm.

Finca Fest drew families, gardeners, educators and community members from across the region. Participants reported greater confidence in growing native plants, a better understanding of sustainable gardening and increased interest in adding nutritious foods to their meals. Many requested additional classes and resources, signaling strong community demand for continued education.

The festival strengthened Lincoln University's leadership in sustainable food systems and demonstrated how Cooperative Extension programs advance food access, conservation and community well-being. Plans are underway to expand Finca Fest and add more workshops.

FUNDING: U.S. DEPARTMENT OF AGRICULTURE'S NATIONAL INSTITUTE OF FOOD AND AGRICULTURE - CAPACITY BUILDING GRANT, AWARD NO. 2023-38821-39964

- FOOD SECURITY
- NUTRITION & HEALTH
- YOUTHS, FAMILIES & COMMUNITIES
- ENVIRONMENTAL STEWARDSHIP

Supporting Missouri Farmers Through Aquaculture Research

The United States is the second biggest soybean producer in the world, and Missouri is among the top-producing states in the country. However, reduced exports have prompted researchers to find new ways to support soybean farmers.

Lincoln University of Missouri's Aquaculture Research team concluded a 12-week research project in October 2025 seeking to do just that.

Ran by graduate student Sadiat Onileowo and supervised by assistant professor of aquaculture Dr. Moureen Matuha, the study evaluated soy-based products as partial and full replacements for traditional fishmeal in rainbow trout diets.

The study used soybean meal and Fermex200, a fermented soybean meal typically used as pig feed alternative. Fish were split into six groups and fed varied levels of fishmeal, soybean meal and Fermex200. At four, eight and 12 weeks, the fish were weighed and measured to assess how different feed ratios affected growth.

At the end of the study, Onileowo and Matuha harvested samples from their testing population to look for impacts on reproductive performance, fillet quality, gut health, enzyme activity, gene expression, protein metabolism, water quality, production costs and sensory profiles, including flavor, smell and texture.

By evaluating soy-based products as a fishmeal alternative, Lincoln is opening new markets and increasing aquaculture production efficiency, fish health and product quality, supporting both soybean farmers and aquaculture producers.

Sadiat Onileowo and another Lincoln University graduate student sample rainbow trout to check their growth as part of a 12-week research study on soy-based fishmeal alternatives.

Looking forward, the team wants to conduct similar experiments with other soy-based products using rainbow trout at different life stages and other freshwater aquaculture species.

FUNDING: EVANS-ALLEN
- ENVIRONMENTAL STEWARDSHIP
- AGRICULTURAL SYSTEMS & TECHNOLOGY0

LINCOLN UNIVERSITY

North Carolina A&T State University

Move to Pork Production Allowing More Farmers to Bring Home the Bacon

North Carolina is still a top tobacco-producing state, but such factors as shrinking acreage, rising costs, labor shortages and changing public perceptions have negatively impacted the industry, and it is considered to be declining.

Dr. Derrick Coble, North Carolina A&T swine geneticist began the Brightleaf to Berkshires program as a way to allow tobacco farmers who have been financially impacted by tobacco policy and social changes to improve the profitability of their farm operations by learning to produce Berkshire pigs using hoop structure barns, an alternative swine production system.

Eighteen farmers enrolled in the program's "swine school," taking part in 10 lessons covering everything from production basics, such as nutrition and reproduction, to more advanced topics in waste management, welfare and behavior, diseases and niche marketing opportunities.

All 18 have graduated and become pork producers. So far, the program has accounted for 25 jobs, $552,500 worth of pork products sold and more than $22,000 in tax revenue for the state, Coble said. He and his group will monitor the group for the next two years to make sure that all participants are continuing their success.

FUNDING: NORTH CAROLINA TOBACCO TRUST FUND COMMISSION GRANT

- AGRICULTURAL SYSTEMS & TECHNOLOGY
- ENVIRONMENTAL STEWARDSHIP

Participants shake hands and celebrate their graduation from the Brightleaf to Berkshires program at the University Farm.

Space to Grow: Hope House Garden Yields More than Vegetables

Research shows that gardening with children promotes their physical and mental health, improves their academic and life skills, and encourages healthier eating habits.

God's Garden at Hope House, a community garden across the street from a transitional living facility, was a forgotten patch of land owned by Greater Joy Baptist Church in Oxford, North Carolina, that had gone to seed. Students in a tutoring program called Naturally Nourished now manage the garden, learning everything from soil health to the water cycle and even incorporating mindfulness and meditation into their visits.

Naturally Nourished students tend to the raised beds, grow onions and greens, and sometimes even get to taste the fruits of their labor. Extension specialists visit to teach about stormwater management and nutrition. Granville County Extension Specialist Wendy Tatum leads lessons using Cooperative Extension's MyPlate curriculum tailored to different ages. Science lessons include getting your hands dirty. Nature becomes the classroom.

Students in the Naturally Nourished program tend the community garden at Hope House in Oxford, North Carolina.

"The kids always talk about how when they go to the garden, they feel better," Tatum said. "It's more than just planting seeds; it's about giving them space to breathe, to disconnect from screens and reconnect with the earth."

The garden has also become a place of transformation for the surrounding community. Once known for crime and drug activity, the neighborhood now sees children playing outside and neighbors harvesting produce. "We don't care if people pick from the garden," said Tatum. "If someone needs food, it's there."

Tatum plans to expand by selling produce at a farmers market and increasing the garden's role in local education.

FUNDING: NORTH CAROLINA COOPERATIVE EXTENSION YOUTH, FAMILY AND COMMUNITIES

- ENVIRONMENTAL STEWARDSHIP
- AGRICULTURAL SYSTEMS & TECHNOLOGY
- YOUTHS, FAMILIES & COMMUNITIES

Prestigious Grant to Power A&T Food Scientist's Fight Against Heart Disease

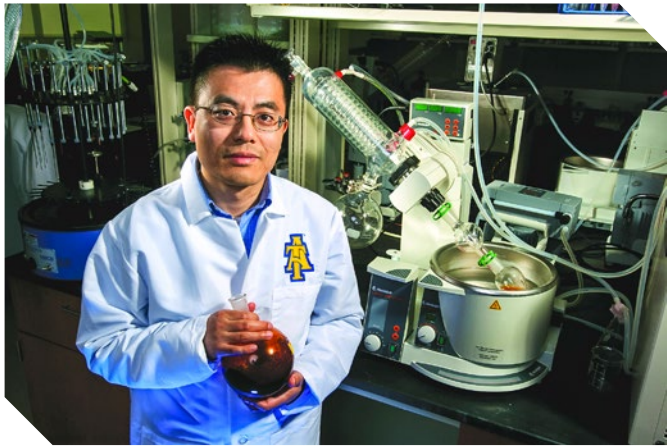
Heart disease is the leading cause of death in the United States, according to the Centers for Disease Control and Prevention. It accounts for roughly one in every three deaths nationwide and costs more than $400 billion each year in health care, medications and lost productivity. Previous research has shown that elevated levels of triglycerides and cholesterol significantly increase the risk of cardiovascular disease.

Shengmin Sang, Ph.D., will seek to identify another potential biomarker of heart disease — carbonyl stress — that will help individuals monitor their health. He will do that by investigating whether flavonoids, which are compounds with antioxidant properties commonly found in fruits and vegetables, can reduce carbonyl stress, the overload of harmful compounds in the body that can induce cardiovascular disease and other chronic health conditions.

Sang will oversee a three-week trial in which a group of people will consume apples, blueberries, soy milk and green tea as flavonoid-rich foods. Sang then will collect and analyze blood and urine samples to measure the time and dose effects of diets high and low in flavonoids, as well as levels of certain molecules and compounds formed when reactive carbonyl species in the body bind to proteins, fats and DNA.

This data will be used to examine relationships between flavonoid metabolites and carbonyl and oxidative stress biomarkers.

"We know that plant-based foods are linked to a reduced risk of cardiovascular disease, but the internal mechanisms of how they work are still unclear," Sang said. "For this project, we want to provide scientific evidence that links plant-based food to the prevention of cardiovascular disease."



Food scientist Shengmin Sang, Ph.D., investigates a possible connection between a plant-based diet and heart disease prevention.

FUNDING: NATIONAL INSTITUTES OF HEALTH'S NATIONAL HEART LUNG AND BLOOD INSTITUTE RESEARCH PROJECT GRANT (R01)

NUTRITION & HEALTH

North Carolina Agricultural and Technical State University

Prairie View A&M University

Advancing Research, Workforce Readiness, Student Achievement

The College of Agriculture, Food and Natural Resources (CAFNR) at Prairie View A&M University (PVAMU) continues to elevate graduate education by strengthening academic excellence, expanding research visibility and preparing highly skilled professionals who contribute to the 1890 land-grant system mission.

The year 2025 marked several historic milestones for CAFNR, reflecting the university's commitment to cultivating the next generation of leaders in agriculture, nutrition, environmental science and community health.

In spring 2025, Catana Janai Faison became the first graduate of the Natural Resources and Environmental Sciences program, making institutional history and setting the foundation for future cohorts. Faison successfully secured full-time employment before graduation, demonstrating the program's relevance and alignment with emerging workforce needs in environmental management and sustainability.

Students represent Prairie View A&M University on the national stage at the 2025 Food & Nutrition Conference & Expo.

Three master's students in nutrition represented PVAMU on the national stage at the 2025 Food & Nutrition Conference & Expo (FNCE) in Nashville, Tennessee — the Academy of Nutrition and Dietetics' premier annual gathering of more than 10,000 food and nutrition professionals, researchers, policymakers and industry leaders. Prince Dunyo, Redeemer Agbolegbe and Kenneth Ofori-Panyin presented their research, marking significant achievements in graduate education.

Andrew Darkwah was inducted into Kappa Omicron Nu National Honor Society (KON), a prestigious academic honor society that promotes scholarship, research excellence, leadership and community service in human sciences.

Darkwah's induction marks the first graduate student KON inductee in CAFNR and demonstrates PVAMU's success in preparing graduate students for advanced academic, research and leadership opportunities.

FUNDING: U.S. DEPARTMENT OF AGRICULTURE'S NATIONAL INSTITUTE OF FOOD AND AGRICULTURE
NUTRITION & HEALTH

Foodscaping Initiative Blossoms with Experiential Learning, Community Impact

The College of Agriculture, Food and Natural Resources (CAFNR), John B. Coleman Library (JBCL) and CAFNR Research hosted its Fall Planting event as part of the Foodscaping Initiative, transforming the raised garden beds at the JBCL into thriving spaces of engagement, learning, service, leadership, sustainability and impact.

Foodscaping integrates edible plants into ornamental landscaping, transforming planter boxes and nursery beds into sources of fresh, organically grown produce. The event brought together students, faculty and community members to celebrate hands-on agriculture while promoting food security and environmental stewardship.

More than 200 students participated in interactive seed germination and planting activities, including members of the Student Garden Club and PV Green Team, who played a leading role in facilitating interactive learning. Students selected edible plant seeds and learned about germination from Student Garden Club members. More than three dozen seed packets were used.

Twelve dozen new plants and herbs were added to the library gardens, including broccoli, white cabbage, turnip greens, lettuce, peppermint, chives, rosemary, oregano, parsley, serrano peppers and marigolds.

The Fall Planting event promoted experiential learning in agriculture while advancing Prairie View A&M University's (PVAMU) commitment to sustainability, health and food security. With

Edible leafy greens integrate into traditional ornamental landscaping to transform planter boxes.

student-led activities, thriving crops and national recognition, the Foodscaping Initiative continues to enhance the visibility and impact of PVAMU's research and outreach efforts.

This cross-campus collaborative effort aligns well with PVAMU's Journey to Eminence 2035, CAFNR's Strategic Plan and the United States Department of Agriculture's National Institute of Food and Agriculture Plan of Work, as well as the Vision of Excellence for CAFNR Research at PVAMU.

FUNDING: U.S. DEPARTMENT OF AGRICULTURE'S NATIONAL INSTITUTE OF FOOD AND AGRICULTURE

- ENVIRONMENTAL STEWARDSHIP
- FOOD SECURITY
- NUTRITION & HEALTH

PRAIRIE VIEW A&M UNIVERSITY

South Carolina State University

Cancer Cooking School Promotes Nutrition, Screening Awareness, Healthier Living

Cancer continues to affect families across South Carolina, with breast, cervical and colorectal cancers among the most diagnosed. While research shows that healthy eating, physical activity, stress management and early detection can reduce cancer risk, many adults lack access to practical education that helps translate health information into action.

South Carolina State University 1890 Research & Extension addressed this need by delivering the Eat Well, Fight Strong Cancer Cooking School across the state in partnership with public health organizations and community partners. Family nutrition and health Extension agents provided research-based education on cancer awareness, screening guidelines and lifestyle strategies that support prevention and recovery. The program included hands-on cooking demonstrations, providing 150 participants with practical tools, including recipes, meal-planning resources and information on accessing screening services.

Tamar Gooseby, Extension agent, shares cancer prevention tips and demonstrates healthy recipes during the Eat Well, Fight Strong Cancer Cooking School workshop in Sumter, South Carolina.

Program evaluations revealed that 89% of participants reported increased awareness of a diet's impact on cancer risk and greater confidence in making healthy meals. Participants said they cooked more at home, ate more fruits and vegetables, reduced dietary fat intake and exercised regularly.

In addition, 55% of participants reported plans to obtain a Pap test, 45% reported plans to obtain a mammogram and 30% reported plans to obtain a colonoscopy or other colorectal screening. Several participants reported scheduling or completing screenings like mammograms, colonoscopies, dermatology exams and genetic tests.

In collaboration with public health partners, the Eat Well, Fight Strong Cancer Cooking School increased cancer awareness, encouraged preventive screening behaviors and supported healthier lifestyle choices for individuals and families across South Carolina.

FUNDING: SOUTH CAROLINA STATE PUBLIC SERVICE & AGRICULTURE
- NUTRITION & HEALTH
- YOUTHS, FAMILIES & COMMUNITIES

Empowering Rural Entrepreneurs: $25,000 Awarded in Business Plan Workshop Series

The South Carolina State University 1890 Community and Economic Development (CED) program hosted a six-week 1890 Rural Business Plan Workshop series, cultivating the foundations of eight Orangeburg County entrepreneurs.

Participants engaged in weekly sessions covering business planning, financial management, marketing and growth strategies. The workshop series culminated with awarding a total of $25,000 in grant prizes to three standout businesses, fueling immediate investment into their businesses:

- First Place - $10,000: Kimberly Jennings, Distinctive Learning with Kids in Mind LLC.
- Second and Third Place - $7,500: Chandlar Glover, Coiffure Collection LLC, and Erica Smith, Rural Roots Collective Cooperative Inc.

Kimberly Jennings, Distinctive Learning with Kids in Mind LLC, receives a $10,000 business development grant during the 1890 Rural Business Plan Workshop.

Jennings, who has partnered with SC State Public Service & Agriculture (PSA) for more than 15 years, said the partnership has led to hiring a new staff member, increased enrollment and the creation of smaller learning groups for the 40 children she serves at the center.

The initiative underscores SC State PSA's commitment to fostering economic development and success across South Carolina's businesses.

FUNDING: SC STATE PUBLIC SERVICE & AGRICULTURE
- YOUTHS, FAMILIES & COMMUNITIES

Southern University and A&M College

Learning by Doing: Summer Internships Support Students Like Cire Portegies

As a junior majoring in Urban Forestry at Southern University's College of Agricultural, Human and Environmental Sciences, Cire Portegies found the Yale Conservation Scholars – Early Leadership Initiative to be one of the most developmental and rewarding experiences of her academic journey.

The program began with the New Horizons in Conservation Convening hosted at Yale School of the Environment, providing an invaluable opportunity to network and engage with emerging and established leaders across diverse environmental disciplines.

Throughout the summer, Portegies strengthened connections with peers and benefited from extensive mentorship through weekly professional development sessions led by the Yale Justice, Equity, Diversity and Sustainability Initiative.

Her host-site placement with Rock Creek Conservancy (RCC), a nonprofit organization in Washington, D.C., served as the ideal catalyst for gaining professional exposure. Coming from a background rooted in laboratory and research experience, Portegies embraced RCC's community-focused, land stewardship mission, which offered hands-on engagement with conservation fieldwork.

In addition to organizing community events, she received training in flame weeding, safe pesticide application and identification of Early Detection Rapid Response species. Leveraging these skills, Portegies contributed to invasive plant removals, tree tagging and water bacteria monitoring at multiple restoration sites.

Upon returning to campus in the fall, Portegies continued to expand her nonprofit experience through an urban forestry internship with Baton Rouge Green.

Looking ahead, she plans to pursue a graduate program in urban forestry and ultimately establish

Cire Portegies gains hands-on experience in conservation fieldwork, including flame weeding, safe pesticide use and identifying Early Detection Rapid Response species.

a nonprofit dedicated to implementing agroforestry systems in urban environments — enhancing climate resilience and promoting food sovereignty through regenerative agricultural practices.

FUNDING: JUSTICE, EQUITY, DIVERSITY AND SUSTAINABILITY INITIATIVE AT YALE SCHOOL OF THE ENVIRONMENT

- AGRICULTURAL SYSTEMS & TECHNOLOGY
- ENVIRONMENTAL STEWARDSHIP

Out the Mud: Nurturing Bright Futures Through Horticulture

The Southern University Agricultural Research and Extension Center (SU Ag Center) is transforming lives through its innovative Out the Mud Urban Horticulture Program, which provides agricultural training to incarcerated, adjudicated and homeless youth.

Operating across multiple campus garden sites, the Southern University Ag Center integrates gardening with nutrition education, interpersonal skill development and workforce preparation. The program's objectives are clear: to create therapeutic horticulture experiences for youth within correctional facilities and school campuses, to promote healthy lifestyles through nutrition education and to build professional and interpersonal skills that open pathways to careers while strengthening family connections.

Participants engage in classroom instruction and hands-on activities, cultivating and maintaining horticultural garden plots. This dual approach not only equips them with technical knowledge but also fosters teamwork, responsibility and resilience.

Upon completion, participants earn certificates that can be added to résumés and job applications, enhancing their employability in horticulture and related industries.

> 134 participants have grown more than 500 pounds of fresh produce.

Urban horticulture participants and mentors harvest mustard greens at AMI Kids in Baton Rouge, Louisiana.

The impact is measurable and inspiring. Seventy-two students have graduated with certifications, with 30% securing agricultural-related jobs. In the past three years, 134 participants have grown more than 500 pounds of fresh produce for personal use, reinforcing nutrition and self-sufficiency skills.

FUNDING: U.S. DEPARTMENT OF AGRICULTURE'S NATIONAL INSTITUTE OF FOOD AND AGRICULTURE - CAPACITY BUILDING GRANT

- AGRICULTURAL SYSTEMS & TECHNOLOGY
- ENVIRONMENTAL STEWARDSHIP
- NUTRITION & HEALTH
- YOUTHS, FAMILIES & COMMUNITIES

Proper Livestock Management Boosts Soil Health

Researchers hosted pasture walks during the study to inform local farmers and the public about the importance of soil health.

Grazing lands account for 55% of all privately owned land in the United States, yet research on their role in soil health has been limited. While crop and forested lands have been studied for their impact on soil health, the Southern University Ag Center conducted one of the first U.S. studies focused on grazing lands.

The four-year study took place at three privately owned farms in south Louisiana. To evaluate the impact of grazing management systems on forage productivity, pastures at each farm were sampled seven times per year for quality, yield and botanical composition. Researchers also measured soil organic matter resulting from rotational grazing.

Three fields at each farm were evaluated twice a year for soil health improvements tied to rotational grazing and increased forage species diversity. Each year, all three farms hosted "Pasture Walks" open to the public, which drew local farmers and student groups. A rotational grazing management system was used at each farm, based on a 30-day rest-rotation schedule.

The study found significant increases in soil organic matter, which contributes to nitrogen nutrition in plants. As nitrogen levels rise, plants absorb more nitrogen, boosting photosynthesis and accelerating growth. The SU Ag Center's research on grazing lands underscores a critical component of the U.S. agricultural ecosystem.

FUNDING: U.S. DEPARTMENT OF AGRICULTURE'S NATURAL RESOURCES CONSERVATION SERVICE

- AGRICULTURAL SYSTEMS & TECHNOLOGY
- ENVIRONMENTAL STEWARDSHIP
- FOOD SECURITY

SOUTHERN UNIVERSITY AND AGRICULTURAL & MECHANICAL COLLEGE

Tennessee State University

Dr. Emily Hayes, research assistant, gives food and animal science students hands-on experience with livestock at the Tennessee State University Ruminant Livestock Facility.

Learning by Doing: TSUAg Uses Transformative Practices to Improve Outcomes

The Tennessee State University College of Agriculture has fully embraced high-impact, experiential learning as a core part of its academic model. Today, TSUAg students learn by doing through fieldwork, internships, research and service — ensuring they graduate ready to contribute immediately to the agriculture industry.

"Students don't just learn — they experience," said Associate Dean De'Etra Young. These hands-on practices build confidence, technical skills and career readiness that the classroom alone cannot match.

Experiential learning is especially essential in fields like environmental science. Dr. Bill Sutton's students spend half their class time in wetlands and ecosystems across Tennessee, gaining real-world identification and data-collection skills. Graduate and undergraduate students collaborate, reinforcing leadership and practical problem-solving.

Internships also play a major role. Junior Cameron Walker, pursuing pre-vet studies, spent the year with the Kentucky Equine Management Internship program, working at Denali Stud Farm. Living and working on site, he gained daily, industry-level experience that strengthened his career goals. "Hands-on experience is key," he said.

Volunteerism reinforces these lessons. Student groups like Minorities in Agriculture, Natural Resources and Related Sciences (MANRRS) engage in service across Nashville — tree planting, community events and clothing drives — building civic responsibility alongside professional skills. Undergraduate research rounds out TSUAg's high-impact model.

Through programs led by faculty like Dr. Sonali Roy, students receive mentorship and training in cutting-edge areas such as CRISPR and gene-editing ethics, preparing them for advanced study and careers in science, technology, engineering and mathematics (STEM). This commitment to immersive, real-world learning defines TSUAg and equips graduates to lead from day one.

FUNDING: U.S. DEPARTMENT OF AGRICULTURE
└ AGRICULTURAL SYSTEMS & TECHNOLOGY

Through Their Eyes: Extension Agents Reflect on Hurricane Helene's Devastation

Hurricane Helene devastated northeast Tennessee and western North Carolina in September 2024, leaving destroyed roads, ruined crops, washed-away homes and deep emotional and financial trauma. Tennessee State University College of Agriculture (TSUAg) Extension agents were already on the ground coordinating relief and connecting residents to urgently needed resources before the waters receded.

Although every community experienced different levels of loss, the grief was universal. The landscape is permanently changed, and no one was prepared for the destruction on this scale. Yet support from partners, volunteers and neighbors has brought hope and reminded many why Extension exists.

Extension agents, the outreach arm of TSU and the University of Tennessee (UT), bring research-based information directly to communities. Despite flooding in three UT-TSU offices, agents assisted each other and their counties.

In Cocke County, new TSU agent Lane Brooks began his career by immediately coordinating support efforts. Hawkins County agents operated a drop-off hub while also relocating the damaged Carter County office and distributing hay, equipment, water and cleaning supplies.

In Johnson County, where infrastructure damage isolated many residents, agents connected donors and resources, including a woman from West Virginia who drove nine hours to deliver supplies after recalling how 4-H shaped her life decades earlier. Throughout the crisis, 4-H youth stepped up as real leaders, organizing donations, assisting with clean-up and helping prepare meals.

East Tennessee's resilience runs deep, and Extension's dedication has been equally strong. The UT-TSU Extension family continues to play a vital role in long-term recovery by providing trusted support to the communities it serves.

FUNDING: OTHER

└ YOUTHS, FAMILIES & COMMUNITIES

TSUAg Extension agents in eastern Tennessee rally to support their communities after Hurricane Helene.

A Noble Mission: TSU Pursues Heat-Tolerant Tomato for Tennessee Farmers

When Tennessee growers faced a difficult 2024 tomato season due to persistent heat, they turned to Tennessee State University College of Agriculture (TSUAg) for help. At the Tennessee Small Farm Expo, farmers approached Dr. Suping Zhou, a research professor, sparking a new effort to identify heat-tolerant tomato production systems for the state.

That effort accelerated when Zhou secured a $300,000 U.S. Department of Agriculture National Institute of Food and Agriculture Rapid Response grant to test tomato varieties, substrates and production environments using precision agriculture tools. Graduate students Jing Zao, Jun Guo and Madhavarapu Sudhakar joined the project, along with recent TSU graduate and project manager Katrina Seaman, who leads outreach and helps translate the work for growers.

Zhou partnered with three experienced farms offering distinct environments: Eldridge's Farm in Woodlawn, Smiley Farm in Ridgetop and Little Creek Produce in Cookeville. Each site compares grafted and non-grafted varieties, different mulches and different production settings, including high tunnels, hoop houses, coconut coir and open-field plantings.

Dr. Suping Zhou, Tennessee State University College of Agriculture researcher, partners with farmer Troy Smiley to test heat-tolerant tomato varieties.

To guide recommendations, the team uses Syngenta's Spiio sensors, which collect real-time data on moisture, salinity, temperature, light and conductivity at canopy and soil levels. Combined with field observations, this data will shape a climate-ready tomato system that farmers can adopt to protect yields during hotter summers.

By combining farmer knowledge with scientific data, the project aims to deliver practical, research-based strategies to strengthen tomato production across Tennessee.

FUNDING: U.S. DEPARTMENT OF AGRICULTURE'S NATIONAL INSTITUTE OF FOOD AND AGRICULTURE

- FOOD SECURITY
- NUTRITION & HEALTH

TENNESSEE STATE UNIVERSITY

Tuskegee University

Tuskegee Opens Possibilities for Food Science Students

To increase the number of students in food and agricultural sciences, Tuskegee University established the TU Food & Agriculture Scholars Program (TUFASP). The scholarship program recruits, mentors and trains undergraduate students pursuing studies in food and agricultural sciences.

Statistics show a significant gender gap between female and male students. Currently, 61% of Tuskegee students are female, compared with 39% male.

Student Cayden Bowe receives honors for his high GPA.

Cayden Bowe is an excellent example of the scholarship's success in recruiting students, including males. A military child, Bowe lived in multiple states before choosing Tuskegee for its certified Food and Nutrition Science program. Now a senior pursuing a degree in food science, he received the TUFASP scholarship. Access to scholarship funds and experiential learning opportunities allowed him to overcome financial barriers, gain valuable skills and build a career that will benefit communities.

Bowe is detail-oriented and research-focused, with hands-on laboratory experience in protein formulation, starch analysis and antioxidant compound extraction. He is proficient in a range of analytical techniques and has demonstrated success in conducting and presenting original research. His leadership experience as president of the TU Food and Nutritional Sciences Club has grown the organization to more than 50 paid members. He has organized events such as a cooking demonstration for the Food and Nutrition Advisory Board, where 26 students prepared pasta and desserts.

FUNDING: U.S. DEPARTMENT OF AGRICULTURE'S NATIONAL INSTITUTE OF FOOD AND AGRICULTURE
- NUTRITION & HEALTH
- YOUTHS, FAMILIES & COMMUNITIES

Small Farm Outreach: Training, Technical Assistance Project

Farmers in Alabama's Black Belt face big challenges. Many lack the tools, training and capital to run their farms. Some risk losing their land and cannot grow enough to support their families. These problems hurt more than just farmers — when farms struggle, local jobs, food and small towns also suffer. Strong farms help build strong families and strong communities.

Tuskegee University works with farmers and landowners in Alabama's Black Belt to help them strengthen operations and protect property. The program focuses on farm planning, record-keeping and financial management. Veterans receive hands-on training and learn how to apply for farm loans and support programs.

In Selma and Dallas County, farmers receive help developing budgets and managing expenses. Special workshops assist heirs' property landowners — families who share land passed down without a legal will. These landowners often face challenges that prevent them from qualifying for loans or fully using their land. Training sessions help them understand their rights and take steps toward legal ownership.

Miles Robinson provides technical assistance to farmers in Salem, Alabama.

> More than $800,000 in loans and grants were approved for land purchases, farm operations and home improvements.

The results show strong progress. A total of 209 support activities were completed, including 92 farm visits, 101 phone or video calls, 11 record-keeping sessions and five credit repair meetings. Fifty-five farmers joined group training, and 37 received one-on-one assistance. More than $800,000 in loans and grants were approved for land purchases, farm operations and home improvements.

Farmers report stronger financial management skills and greater confidence in sustaining their land — building a stronger future for families and rural communities across Alabama.

FUNDING: U.S. DEPARTMENT OF AGRICULTURE'S NATIONAL INSTITUTE OF FOOD AND AGRICULTURE
└ YOUTHS, FAMILIES & COMMUNITIES

TU2U Brings Fresh, Campus-Grown Vegetables to Tuskegee Students

Providing fresh, locally grown vegetables to students is a challenge for most colleges and universities. Tuskegee University is tackling that challenge through TU2U, an initiative that delivers vegetables grown on campus directly to students.

Tuskegee students once again have the opportunity to enjoy wholesome, nutritious food grown by their peers. Fresh vegetables, including those organically and conventionally grown using hydroponic technology, are now served in the campus cafeteria as part of TU2U.

Feeding students vegetables grown on campus by the College of Agriculture, Environment and Nutrition Sciences (CAENS) is not new. As early as 1882, Tuskegee students participated in programs that provided food to those enrolled at the university.

Tuskegee University President Dr. Mark A. Brown receives fresh vegetables from the College of Agriculture, Environment and Nutrition Sciences leadership.

The launch of TU2U and vegetable distribution to locals reflects the original mission of the Farmers' Conference, initially known as the People's Conference, which aimed to train communities on advances in agricultural production while emphasizing nutrition.

The program builds on CAENS initiatives already in place through state programs that supply Alabama schools with fresh produce. These include carrots, bell peppers, black-eyed peas, tomatoes, sweet potatoes, zucchini, yellow squash, zephyr squash, collard greens, kale, mustard greens and more. Participating schools include those in Elmore and Macon counties, as well as D.C. Wolfe School in Shorter, Booker T. Washington High School, George Washington Carver Elementary School, Notasulga High School, Tuskegee Institute Middle School and Tuskegee Public School.

FUNDING: U.S. DEPARTMENT OF AGRICULTURE'S NATIONAL INSTITUTE OF FOOD AND AGRICULTURE
- FOOD SECURITY
- NUTRITION & HEALTH
- YOUTHS, FAMILIES & COMMUNITIES

TUSKEGEE UNIVERSITY

University of Arkansas at Pine Bluff

Arkansas Universities Partner to Strengthen Poultry Workforce

Arkansas is a national leader in poultry and animal production, yet the industry continues to face workforce shortages, particularly in technical and management positions. Preparing a new generation of professionals who understand both animal and poultry sciences is essential to maintaining the state's agricultural strength.

Innovative academic partnerships that provide students with cross-disciplinary training and industry experience can help address the skills gap and meet the growing demand for qualified professionals in the food production sector.

The UAPB–UAF 3+1 Program develops a skilled poultry science workforce to boost food safety and Arkansas's agricultural economy.

> Graduates of the 3+1 Poultry Science Program are emerging as highly qualified professionals ready to contribute to the livestock and poultry industries.

The University of Arkansas at Pine Bluff (UAPB) and the University of Arkansas at Fayetteville (UAF) have partnered to create the 3+1 Poultry Science Program, an innovative dual-degree opportunity. Students complete three years at UAPB in animal science and a final year at UAF focusing on poultry science, earning bachelor's degrees from both institutions. The program provides hands-on training in animal production, poultry management and food systems, preparing students to enter the workforce with a strong foundation in both disciplines.

Graduates of the 3+1 Poultry Science Program are emerging as highly qualified professionals ready to contribute to the livestock and poultry industries. One recent graduate from Zambia completed both degrees and immediately secured a full-time position with American Foods Group as a management trainee in quality assurance.

The program's success demonstrates the effectiveness of cross-institutional collaboration in producing career-ready graduates who possess both scientific and practical industry knowledge.

FUNDING: OTHER
- FOOD SECURITY
- NUTRITION & HEALTH

Aquaponics in the Classroom: Innovative Approach to Alleviating Food Insecurity

Food insecurity is a significant public health issue that requires immediate attention. Addressing ongoing food insecurity means continuing to invest in long-term programs that promote food security, sustainable agriculture and healthy eating habits.

Additionally, tackling issues such as obesity and poor nutrition is crucial, as unhealthy lifestyles contribute to chronic diseases and other negative health outcomes.

To help combat food insecurity challenges, the University of Arkansas at Pine Bluff partnered with a local middle school to establish an aquaponics system, where plants and fish are grown in the same water tanks. The waste from the fish provides essential nutrients to the plants. These systems are convenient solutions for schools or households because they can be set up and maintained indoors.

Over the course of the school year, the middle school students learned about interactions in ecosystems, resource consumption and population growth. The aquaponics system provided a perfect real-world example to tie these concepts together. Students analyzed how the fish, plants and bacteria interact in a self-sustaining environment, reinforcing their understanding of nutrient cycles and sustainable food production.

Participants reported that the aquaponics system helped them understand how different organisms depend on each other – seeing the fish, plants and water work together made learning about ecosystems more interesting and "real."

The hands-on project not only teaches science and sustainability but also empowers students to explore innovative solutions to food production challenges, inspiring them to think critically about sustainable agriculture and the future of food.

Dr. Karleah Harris holds a channel catfish from Watson Chapel Junior High School's aquaponics system.

FUNDING: U.S. DEPARTMENT OF AGRICULTURE'S NATIONAL INSTITUTE OF FOOD AND AGRICULTURE, AWARD NO. 2021-38821-34712

- FOOD SECURITY
- NUTRITION & HEALTH
- YOUTHS, FAMILIES & COMMUNITIES

Natural Solutions for Healthier Sheep: Research Tackles Antibiotic Overuse in Livestock

Overuse of antibiotics and dewormers in livestock production has raised food safety concerns and driven parasite resistance, making conventional chemical-based control programs increasingly ineffective. As resistance grows, farmers face diminishing returns on costly treatments, while consumers worry about antibiotic residues in food.

To address these challenges, the University of Arkansas at Pine Bluff initiated a two-year study to evaluate the effects of natural immunomodulators, specifically sericea lespedeza and walnut hull powder, on the innate immunity of sheep. The research aims to improve the overall health of sheep by enhancing gastrointestinal functionality and immune response through dietary supplementation.

The natural alternatives being tested directly contribute to safer food on the tables of consumers. When livestock producers can maintain animal health with fewer antibiotics and chemical treatments, there are fewer potentially harmful residues in the meat, milk and other animal products consumed by the public.

This research supports both ends of the food system, helping farmers produce animals more sustainably while providing consumers with safer, more naturally raised products. The project paves the way for farming practices that balance productivity with sustainability, supporting food security and environmental stewardship goals.

These natural approaches could help United States producers remain competitive in markets that increasingly demand products raised with minimal chemical inputs, positioning American farmers at the forefront of sustainable livestock innovation.

A student learns about livestock nutrition.

FUNDING: U.S. DEPARTMENT OF AGRICULTURE'S AGRICULTURAL RESEARCH SERVICE
- FOOD SECURITY
- NUTRITION & HEALTH

UNIVERSITY of ARKANSAS AT PINE BLUFF 1873 ™

University of Maryland Eastern Shore

Active Research Experience Fuels Growth for UMES Students

Learning by doing takes classroom and textbook knowledge and applies it to real-world situations. Experiential opportunities are the backbone of student success, helping them gain practical skills, research acumen and stronger critical thinking.

The University of Maryland Eastern Shore's (UMES) School of Agricultural and Natural Sciences uses a streamlined approach to help undergraduates strengthen résumés, build professional networks, graduate on time and be ready for internships, graduate school or employment.

"Our students who have completed meaningful research experiences have landed premier internships or jobs in industry and government, been published in prestigious scholarly journals, and accepted into top graduate programs across the country, including Ivy League schools," said Moses T. Kairo, dean of the UMES School of Agricultural and Natural Sciences.

Faculty-mentored research is an integral part of senior capstone courses, along with lab and field work on federal, state and private-sector grant-funded projects, Kairo said.

UMES junior Norman Trinidad, a general agriculture major, is researching how drought stress and mycorrhizal fungi affect the shoot and root growth of marshmallow (Althaea officinalis). Under the mentorship of Corrie Cotton, assistant research professor, he helped design the project and collect field data.

"This experience has given me a deeper appreciation for how much work goes into scientific research and allowed me to apply classroom knowledge in real-world conditions," Trinidad said. "It has strengthened my critical thinking, problem-solving and time-management skills while showing me the value of hands-on learning in agriculture."

FUNDING: THE UNIVERSITY OF MARYLAND EASTERN SHORE'S SCHOOL OF AGRICULTURAL AND NATURAL SCIENCES

YOUTHS, FAMILIES & COMMUNITIES

Norman Trinidad, a junior at the University of Maryland Eastern Shore, studies how drought stress and mycorrhizal fungi affect marshmallow growth.

Value Addition Boosts Family Farm Profits

Small- to mid-sized farms are steadily joining the value-added agriculture movement, and University of Maryland Eastern Shore (UMES) Extension activities help pave the way for farmers.

Value-added agriculture enhances the profit of a farm by creating new products, expanding market reach and increasing returns.

Dr. Nadine Burton, alternative crop specialist, is conducting research at UMES' Research, Extension and Teaching Farm to help small-scale farmers learn about crop options to meet consumer demand in regional niche markets.

"An alternative crop for us is one that is grown in place of another crop. For example, kale and collards don't grow well here on the Eastern Shore in the summer because of the heat, humidity and insect pressure, but a tropical crop like amaranth or jute leaf will," Burton said.

Better yet, they are also considered value-added because "they can generate more money than a traditional crop," she added.

Dr. Nadine Burton, alternative crop specialist, gives a tour of the University of Maryland Eastern Shore Research, Extension and Teaching Farm in Princess Anne, Maryland.

Also on the research farm, herbalist Henriette den Ouden provides guidance on medicinal and specialty herbs to beginning farmers and professional herb growers and processers. Her instruction ranges from herb selection, soil amendments, cultivation, harvesting and drying techniques, uses, value-added products and marketing.

UMES Extension also encourages farmers to consider supplementing and varying their income through agritourism, which increases revenue by offering education and entertainment on a farm.

Additionally, it can create retail opportunities for farm-produced products. Dr. Prem Bhandari, agritourism and value-added agricultural marketing specialist, helps farmers find their space in the burgeoning sector.

FUNDING: U.S. DEPARTMENT OF AGRICULTURE'S NATIONAL INSTITUTE OF FOOD AND AGRICULTURE; MARYLAND LEGISLATURE

- FOOD SECURITY
- YOUTHS, FAMILIES & COMMUNITIES

One Health Approach Guides Vibrio Research in Oysters

Researchers at the University of Maryland Eastern Shore (UMES) are answering the call to investigate how human health depends on the health of the environment and animals.

The One Health concept notes the interconnectedness of human, animal and environmental health and seeks to better the well-being of all three by promoting collaboration across sectors. Dr. Salina Parveen, a UMES professor, has been using One Health as a guiding light in her study of Vibrio bacterium since 2004.

Vibrio occur naturally in coastal waters, but increasing temperatures and salinity create conditions in which the bacteria can thrive and spread. It can infect humans who eat undercooked or raw oysters, or who go fishing or swimming with an open wound in waters where Vibrio concentration is high.

The Centers for Disease Control and Prevention estimates there are 80,000 cases of vibriosis (the human illness caused by Vibrio) annually in the United States, with 52,000 cases related to shellfish consumption. Symptoms range from diarrhea to a flesh-eating disease that can result in amputation or death.

Graduate student Alissa Riley, Dr. Salina Parveen and Scott Robinson Jr. tong oysters from the bottom of the Honga River, an estuary of the Chesapeake Bay.

> “Extensive research on ecology, antibiotic resistance, genomics, metagenomics and control of Vibrio has already helped Parveen’s lab develop methods to address oyster infection.

To address Vibrio infection, Parveen and her research team aim to know the bacteria inside and out.

“We have to know the sources. Where is it? What can we learn about it? How do we kill or control it? Our lab is conducting research on all these approaches,” she said.

Extensive research on ecology, antibiotic resistance, genomics, metagenomics and control of Vibrio has already helped Parveen’s lab develop methods to address oyster infection. Her methods inform aquaculturists, industry, consumers and policymakers.

FUNDING: EVANS-ALLEN, AWARD NO. 7004886
└ FOOD SECURITY

UNIVERSITY OF MARYLAND EASTERN SHORE

Virginia State University

Janiah B. Lee, Extension special assistant to the associate dean, participates in a youth-focused agricultural education activity.

USDA Scholarship Shapes VSU Graduate's Career

Many students enter college with financial barriers and limited awareness of career opportunities within agriculture. For first-generation and out-of-state students in particular, tuition costs and lack of exposure can hinder persistence and degree completion.

Virginia State University's (VSU) College of Agriculture works to remove these barriers by connecting students to scholarships and experiential learning that support retention, career clarity and workforce readiness.

Janiah B. Lee, an out-of-state student from Springfield, Massachusetts, entered VSU as an undecided major. Through guidance from university staff, she learned about the United States Department of Agriculture 1890 National Scholars Program and applied. The scholarship covered her full tuition, housing, meals and books, and provided two paid summer internships with the USDA's National Institute of Food and Agriculture.

While pursuing a degree in agricultural business with a minor in economics, Lee also volunteered with VSU Cooperative Extension and completed a post-graduate internship under the associate dean, gaining hands-on experience in Extension programming, farm operations, professional development and community outreach.

The scholarship and internships allowed Lee to remain enrolled at VSU, focus on academic success and build a strong professional network. She graduated in May 2025 and transitioned directly into employment as the Extension special assistant to the associate dean.

Her pathway demonstrates how targeted scholarships and experiential learning can lead to immediate career placement. Lee credits the program with clarifying her career goals and preparing her for long-term leadership within Cooperative Extension.

This student success story highlights the impact of College of Agriculture investments in scholarships and career development that translate directly into workforce outcomes.

FUNDING: U.S. DEPARTMENT OF AGRICULTURE 1890 NATIONAL SCHOLARS PROGRAM

YOUTHS, FAMILIES & COMMUNITIES

VSU Program Inspires Future Animal Science Professionals

Many high school students have limited exposure to real-world agricultural experiences, reducing awareness of careers in animal science and veterinary medicine. Without hands-on learning, students may not fully understand livestock management or see agriculture as a viable career option.

Virginia State University's (VSU) College of Agriculture identified this gap and the need to connect students with immersive experiences that support workforce development and recruitment into agricultural studies.

For more than a decade, VSU Extension has partnered with the Chesterfield Career and Technical Center Veterinary Science Program to deliver experiential learning at VSU's Sheep Unit. In recent years, the program expanded to include Richmond and Henrico counties.

Alumni Mackenzie Spencer and Javin Davis discovered Virginia State University through an Extension-led tech center experience.

Each year, VSU hosts two to five half-day programs reaching about 600 high school students. Participants engage in hands-on activities such as sheep handling, reproductive ultrasound, parasite diagnostics, ram semen collection and lambing simulations. They also meet VSU faculty, staff and student workers to learn about academic pathways, scholarships and careers in animal science and veterinary medicine.

These experiences boost student knowledge, skills and interest in agricultural careers. Post-program surveys in 2025 showed intent to apply to VSU rose from 23% before participation to 54% after, with others indicating they would consider applying. Half reported the program influenced their decision, and all became aware of VSU's College of Agriculture and scholarship opportunities.

Long-term impacts include alumni Mackenzie Spencer, now animal systems coordinator at VSU's Randolph Farm, and Javin Davis, a current veterinary student at Virginia Tech. This program strengthens workforce pipelines and positions VSU as a gateway to animal science careers.

FUNDING: U.S. DEPARTMENT OF AGRICULTURE'S NATIONAL INSTITUTE OF FOOD AND AGRICULTURE; SMITH-LEVER EXTENSION PROGRAM

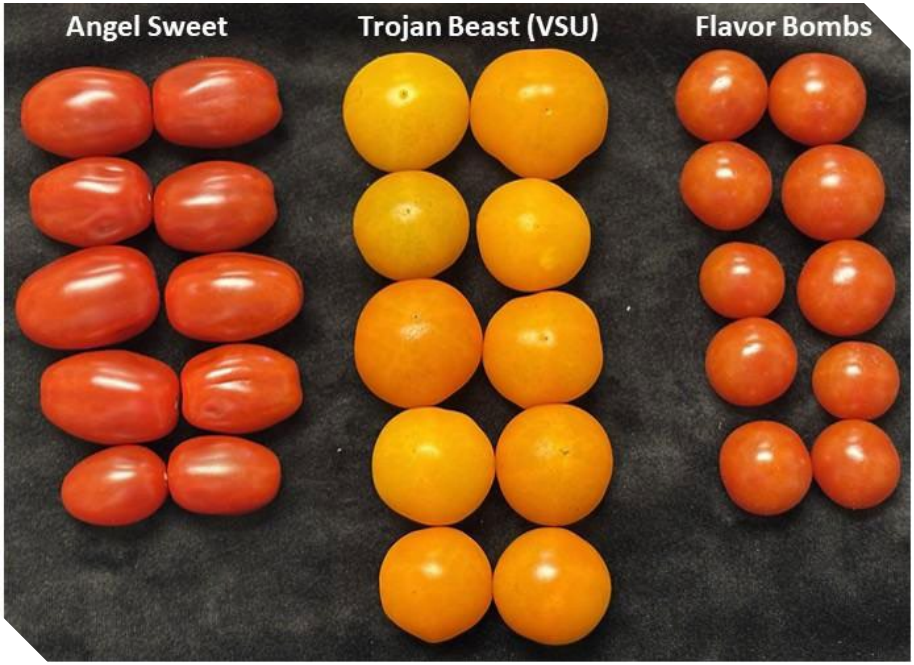
└ YOUTHS, FAMILIES & COMMUNITIES

Trojan Beast: VSU Tomato Line Poised for Market Success

Tomatoes are among the most widely consumed vegetables worldwide and rank as the third most economically important vegetable crop in the United States, with a farm value of $2.61 billion. Virginia is among the top 10 tomato-producing states, making crop quality and market appeal critical for local growers.

Decades of breeding have prioritized yield, often at the expense of flavor. Wild tomato species offer untapped genetic traits that can improve taste, stress tolerance and yield when reintroduced into cultivated varieties.

In 2012, researchers at Virginia State University launched a long-term breeding project to incorporate desirable traits from wild species into cultivated tomatoes. A cherry tomato was crossed with Solanum pennellii in 2015, followed by a backcross with a beefsteak tomato in 2016. After eight years of single-fruit selection, the team developed a mapping population of 250 lines with wide variation in agronomic traits, creating a valuable genetic resource for improvement.



Virginia State University's Trojan Beast produces larger fruits with an attractive color.

Field taste tests identified several lines with strong traditional flavor. One standout, Trojan Beast, is a cherry-type tomato with an attractive orange color and exceptional taste. Introduced at the 2025 VSU Field Day and Virginia State Fair, Trojan Beast earned positive feedback. It produces significantly larger fruits than popular cherry varieties, averaging 16.34 grams per fruit, while maintaining competitive sweetness.

Trojan Beast shows strong potential for commercialization, offering growers a flavorful, fresh-market option to boost profitability. Ongoing research will evaluate yield, pest resistance and flavor compounds to support adoption.

FUNDING: EVANS-ALLEN
AGRICULTURAL SYSTEMS & TECHNOLOGY

VIRGINIA STATE
Since 1882

West Virginia State University

Scholarship Program Growing the Next Generation of Change

West Virginia State University (WVSU) NextGen scholarship recipient Dakota Saunders credits the experience she is receiving through her education for her success in running her own farmers market produce stand.

Although college once felt out of reach financially, the scholarship provided funding and a path into agriculture for the WVSU sophomore.

"NextGen made college real for me," she said. "It opened doors I never expected."

What began in 2018 as a small family nursery — selling mums and produce — became a registered business by 2023, serving an expanded customer base. Today, Saunders maintains a permanent stall at a popular farmers market in the state's capital city region.

West Virginia State University NextGen Scholarship recipient Dakota Saunders.

Saunders credits NextGen faculty and staff for providing resources, tutors and connections, while the program's flexibility allowed her to tailor her education to her evolving goals. She aims to continue in agriculture by managing projects, leading outreach and promoting land stewardship. Long term, she plans to motivate local high school students toward higher education and agriculture careers through workshops or mentorships.

WVSU received funding for the NextGen Scholarships through the United States Department of Agriculture's National Institute of Food and Agriculture's "From Learning to Leading: Cultivating the Next Generation of Diverse Food and Agriculture Professionals" program. It provides full scholarships to WVSU students whose majors focus on food, agriculture, natural resources and human sciences.

FUNDING: U.S. DEPARTMENT OF AGRICULTURE'S NATIONAL INSTITUTE OF FOOD AND AGRICULTURE - NEXTGEN GRANT

- AGRICULTURAL SYSTEMS & TECHNOLOGY
- FOOD SECURITY

Extension Partnership: 'Wild' Trip in Wildlife Education

West Virginia State University (WVSU) Extension Service recently renewed a partnership with the West Virginia Division of Natural Resources (WVDNR) to provide programming at the Claudia L. Workman Wildlife Education Center (Workman Center), a wildlife education facility located near the state's capital city. The Workman Center welcomes visitors to explore, learn and connect with the natural beauty and wildlife of West Virginia.

WVSU 4-H staff members work on site, teaching wildlife education courses to visiting school groups, interacting with public visitors and keeping up with the center's exhibits, which include everything from live snakes, turtles and fish to an active beehive, an outdoor amphitheater and a large taxidermized elk.

Interactive educational classes showcase native wildlife, including game management, forestry, stream restoration and how to identify native plants and animals. In addition, the facility offers three miles of hiking trails that feature interpretive signage and outdoor exhibits, which allow kids a chance to explore nature firsthand.

> "The Workman Center has welcomed more than 3,000 students for educational tours.

West Virginia State University Extension Educators Kim Smith and Brooke Phillips conduct a wildlife education class with young people.

The Workman Center has welcomed more than 3,000 students for educational tours since WVSU 4-H and WVDNR began collaborating in 2022, as well as more than 25,000 public visitors.

"The kids loved everything they did and talked about it with their families," said a visiting teacher. "In turn, parents responded by telling us how much they liked the field trip for their children."

Added another teacher, "We will be back next year! Our kids don't get out in the woods much where they live, and the hike was a wonderful experience for them."

In 2025, the partnership was renewed for an additional three years.

FUNDING: U.S. DEPARTMENT OF AGRICULTURE'S NATIONAL INSTITUTE OF FOOD AND AGRICULTURE - 1890 EXTENSION; WEST VIRGINIA DIVISION OF NATURAL RESOURCES

└ YOUTHS, FAMILIES & COMMUNITIES

Building Arsenic-Tolerant, Healthy Crops in West Virginia

In West Virginia, farming is both a tradition and a livelihood. But hidden threats like arsenic in soils and water can harm crops, reducing yields and threatening food safety. Arsenic stress makes plants weaker, slows growth and can even leave harmful residues in the food chain.

At West Virginia State University, Drs. Padma Nimmakayala and Umesh K. Reddy's lab is tackling this challenge head-on using CRISPR gene editing. This cutting-edge tool works like a pair of precise scissors that can "switch off" genes that harm plants instead of helping them.

In a breakthrough effort, the team has successfully developed arsenic-tolerant tomato plants by silencing a gene that had no beneficial role. In fact, it was harmful. Removing this "bad actor" not only gave the tomato plants resistance to arsenic stress but also brought surprising bonuses, including the following.

- More nutritious fruits: These tomatoes produce higher levels of carotenoids, the natural compounds that give tomatoes their red color and are linked to better eye and heart health.
- Faster fruit ripening: Farmers benefit from quicker harvest cycles and higher market value.
- Multiple layers of protection: The same change that improves arsenic tolerance also boosts the plant's overall resilience to heavy metals, making it a multi-benefit trait.

Dr. Umesh K. Reddy and team are using CRISPR gene editing in their research at West Virgina State University.

The team is now preparing to patent this discovery, which could open the door to healthier crops and safer food supplies not just in West Virginia but worldwide. By fine-tuning plants' own defense systems, this approach shows how modern science can protect farmers, improve nutrition and strengthen food security all at once.

FUNDING: U.S. DEPARTMENT OF AGRICULTURE'S NATIONAL INSTITUTE OF FOOD AND AGRICULTURE
- FOOD SECURITY
- ENVIRONMENTAL STEWARDSHIP

WEST VIRGINIA STATE UNIVERSITY
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