

[West Virginia State University Researcher Awarded \\$1.2 million National Science Foundation Grant](#)

ARD Updates

ASSOCIATION OF 1890 RESEARCH DIRECTORS

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AI helps A&T become an ag driving force

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HARMANDEEP SHARMA, a crop science researcher and professor in the Department of Natural Resources & Environmental Design at the HBCU, is helping students put the past images of what farm life is supposed to look like to rest.

While most picture a farm as a farmer working in soil and in a field of crops all day, that's not the case, especially in her agricultural lab. Stu-

dents and visitors will see rows of crops embedded with sensors and drones flying overhead to monitor the fields. Sharma's hands are also not dirty with soil, but she holds her laptop while she inserts daily data on the crop's health. "There has been a very rapid advancement of agriculture over the past couple of years," Sharma said.

"With this technological advancement, we have sensors, we have drones. We are in the era of Agriculture 5.0."

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Harmandeep Sharma, Ph.D., director of the North Carolina Agricultural and Technical State University College of Agriculture and Environmental Sciences' plant sensor lab, will use the SAS Viya platform to analyze data from both drones and in-ground sensors monitoring specialty crops. Sharma won a SAS HBCU+ Fellows Program award to support her work. (Photo courtesy of N.C. A&T.)



Message from the Chair / DR. LOUIS WHITESIDES

Dear Friends and Colleagues,
As I conclude my final term as chair of the Association of Research Directors, I sincerely thank you for your hard work and commitment to advancing agricultural research at your respective institutions. Our contributions toward advancing agriculture have generated innovative solutions to ensure a progressive and prosperous agricultural future and create a sustainable legacy of 1890 land-grant universities.

We *must* continue to address the critical challenges of the agriculture industry. The underserved, limited-resources farmers, families, communities and individuals we serve depend on the technological advancements in agriculture that we discover to improve their quality of life.

Our research extends beyond the lab, whether in a

physical space or the field. Our most significant influence in the agriculture sector is the mentorship, guidance and education we provide to students. Undergraduate and graduate research provides students with opportunities to gain experience and possibly discover new knowledge. However, what is most important is that we have a direct impact on helping to shape the future by developing today's and tomorrow's leaders and innovators.

Continuing to focus on the future: I hope Congress will fund our priorities. The capacity grants, capacity building grants, facilities grants, 1890 Centers of Excellence, scholarship program and agricultural research infrastructure priorities are paramount to expanding our mission, creating economic development opportunities and preparing a qualified workforce.

To each of you, thank you for trusting me to lead ARD. It has been an honor. I also extend a heartfelt thank you to Dr. Alton Thompson for his wisdom, guidance and friendship. Finally, I offer my best wishes to Dr. Wesley Whittaker for a successful term.



DR. LOUIS WHITESIDES



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Congress approved the Evans-Allen Act of 1977 to provide capacity funding for food and agricultural research at the 1890 land-grant universities and Tuskegee University (the 1890 Institutions) similar to that provided to the 1862 universities under the Hatch Act of 1887. Research conducted under the Evans-Allen Program has led to hundreds of scientific breakthroughs of benefit to both the unique stakeholders of the 1890 institutions and the nation as a whole. The Evans-Allen Program has been extremely important in allowing the 1890 institutions to attract top-notch scientists to their campuses, conduct high-quality and innovative research and become more fully integrated within the land-grant system.

This edition, includes impacts from the 1890 research program submitted by scientists at Lincoln University.

Lincoln unlocks potential of multipurpose quinoa

Quinoa, a nutrient-rich grain native to South America, is a member of the Goosefoot family (Chenopodiaceae), including crop plants such as sugar beets, Swiss chard and spinach. It has been cultivated for approximately 7,000 years. Today, Lincoln University of Missouri (LU) researchers are exploring innovative ways to use quinoa beyond its traditional grain form. We focus on its potential as a climate-smart, nutrient-rich crop that can benefit undersourced small farmers by boosting farm revenue. LU's ongoing research and Extension effort is supported through funding from the USDA-NIFA 1890 Capacity Building Grant and the Evans-Allen formula-funded re-research program.

Led by Safiullah Pathan, an associate professor of crop sciences, the LU quinoa research team has been investigating the use of an en-

The U.S. is currently the world's largest consumer of quinoa, importing approximately 30 million kilograms in 2022 alone. Despite this high demand, quinoa cultivation in the U.S. remains limited. To help close the gap between demand and production, LU has launched an initiative to select promising quinoa cultivars that demonstrate high-yield performance and resilience to biotic and abiotic stress in Missouri and the broader Midwest. Recently, LU researchers identified two quinoa genotypes showing promising regional results.

Quinoa's nutritional value extends beyond its grains. Notably, quinoa leafy greens are rich in protein and omega-3

fatty acids, low in carbohydrates and provide an excellent source of amino acids and minerals compared to similar leafy vegetables such as spinach. As such, quinoa leafy greens retain health-promoting properties, including antimicrobial, anticancer, antidiabetic and anti-obesity benefits. Furthermore, quinoa greens are low in fat, high in fiber and packed with minerals, including potassium, manganese and copper, alongside moderate amounts of calcium, phospho-



Dr. Safiullah Pathan in the quinoa field. (Photo courtesy of Lincoln University.)

tire plant (both grain and leafy greens), including its potential as a forage crop and ways to maximize yield by harvesting leafy greens and grain from a single plant—a novel cultivation strategy. According to Pathan, leafy greens are green leaves, microgreens and sprouts.

rus, sodium and zinc.

“What is even more appealing about quinoa's leafy greens is that they can be grown year-round—in the field, high tunnel and/or greenhouse—and harvested in about 30 days after planting,” said Pathan.

Quinoa microgreens and sprouts are equally rich in amino acids, vitamins, minerals, antioxidants, and health-promoting phytochemicals. They are becoming popular as raw

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LU cultivates knowledge and sustainability with forest farming

Lincoln University has been a leader in advancing sustainable farming practices, and its latest endeavor, forest farming research, is paving the way for a new era of agriculture that harmonizes with the natural environment.

Forest farming practices refer to cultivating high-value specialty crops in the forest understory with the specific management of the canopy and forest overstory to promote the growth and establishment of the desired nontimber forest products (NTFPs). Forests supply economic, social and ecological benefits through wild harvested non-timber forest products (NTFPs), adding more than \$1 billion annually to the U.S. economy. Approximately 20 to 25% of the U.S. population harvests nontimber forest products for personal use, primarily from family forests or woodlands.

According to the Missouri Department of Conservation, closed canopy woodlands make up about a third of the state, and private landowners control 85% of the total 15 million acres. While forest farming is not entirely new, it has taken on a unique and transformative dimension at Lincoln. Dr. Sougata Bardhan, assistant professor of natural resource management in the College of Agriculture, Environment and Human Sciences, developed the forest farming research project through a McIntire-Stennis formula-funded research program.

Bardhan is studying a 14-acre forest plot on Lincoln's Alan T. Busby Farm to benefit socially disadvantaged and limited-resource farmers by adopting forest farming systems.

"These sorts of properties are everywhere – in every farmer's property, you will find areas like this," said Bardhan. "So, there's a tremendous opportunity for us to make a huge impact, which will not only generate income for farmers but protect the environment and create ecosystem services."

The core of Lincoln's forest farming research lies in agroforestry, which combines trees, crops and sometimes livestock in the same land area. The team primarily focuses on cultivating shade-tolerant crops, such as mushrooms, ginseng and medicinal herbs, which thrive under the canopy of mature trees.

However, Lincoln's forest farming research is not confined to the academic realm; it is deeply rooted in the local community. The university has partnered with local farmers and landowners, offering workshops and training sessions (through a North Central Region – Sustainable Agriculture Research and Education, Professional Development Grant; NCR-SARE ENC22-211) to share knowledge and techniques developed through their research. These efforts are particularly significant for small-scale farmers looking for sustainable ways to diversify their income.

While Lincoln's forest farming research has made significant strides, the journey is far from over. Through a USDA-NIFA 1890 Capacity Building Grant, the team established a forest farming network modeled after such coalitions

in the Appalachian and Northeast U.S. This resulted in forest farming adoption in Missouri and the Midwest. Through this project, they plan to use a grass-roots approach to build a localized network of farmers, landowners, and researchers interested in forest farming. This will complement ongoing research on agroforestry and forest farming at Lincoln.

However, the researchers are not without their challenges. One of the primary concerns is balancing agriculture's needs with preserving biodiversity. Ensuring that forest farming does not lead to deforestation or habitat loss is a constant consideration.

"It's all about staying rational and balanced in the approach," Bardhan said. "A forest which is not healthy is



Dr. Sougata Bardhan explains the forest farming research at Lincoln University's Alan T. Busby Farm.

not the best environment you can have, even for tree-huggers. I'm one myself, but I am still cutting down trees because I know if I do this, the rest of the trees will be healthier."

As Lincoln continues to push the boundaries of forest farming research, its work is not just about growing food but a sustainable future. The university's efforts are laying the groundwork for a new agriculture that respects the natural world while providing for human needs. In the years to come, Lincoln's research could become a model for other institutions and communities across the globe. By demonstrating that forests can be productive and preserved, they are showing us a path forward—a path that leads to a greener, more sustainable future for all.

References:

- <https://www.newstribune.com/news/2022/nov/03/lu-research-to-bolster-forest-management/>
- <https://portal.nifa.usda.gov/web/crisprojectpages/1031953-building-a-forest-farming-network-to-support-greater-farm-diversity-and-enhanced-ecosystem-services-in-missouri.html>
- https://projects.sare.org/sare_project/enc22-211/

Quinoa . . . From page 2

vegetables in salads, sandwiches, wraps and other dishes and continue to gain recognition from the food industry and healthcare sectors.

As variable and extreme weather — from warming temperatures to precipitation extremes and seasonal drought conditions — is negatively impacting forage production in the Midwest, there is an urgent need for alternative, climate-resilient feed sources to support livestock producers. In the U.S., hay production has declined from about 140 million tons in 2013 to 119 million tons in 2023. In response, farmers are seeking new solutions to sustain their operations. In many countries, the entire quinoa plant has been evaluated for its potential use as a forage crop due to its high nutritional value for livestock.

However, this application still needs to be thoroughly evaluated in the U.S. Preliminary research results conducted at LU indicate that quinoa hay is of high quality, having a nutrient profile and protein contents comparable to those measured in common forages like alfalfa and clover. Moreover, quinoa's tolerance to drought, salinity and cold and its adaptability to less fertile soils with minimal water requirement makes it a promising climate-smart, sustainable feed alternative for multispecies livestock, including small ruminants.

Farmers can increase their income by harvesting leafy greens and grains from the same plant. This is achieved by cutting quinoa leaves early and harvesting grains from the

same plants later. Based on our preliminary field trials, green leaves and grains can be harvested from the same

plants with good economic returns. Leafy greens are harvested about four weeks after planting, approximately six inches above the ground level, allowing the plants to mature. Grains are harvested from four to five smaller inflorescences of side branches (from cut plants) instead of big ones (from uncut/control plants). The innovative multi-use quinoa research at LU is the first in the U.S., Pathan said, being conducted to determine the feasibility of harvesting quinoa leafy greens and grains from the same plant.

For more information, please contact Dr. Safiullah Pathan at patbans@lincolnu.edu, or 573.681.5963, Cooperative Research, Lincoln University, Missouri.



Grato Ndunguru (Senior Technician) revealing new cultivation methods to attendees at a quinoa field day

AI . . . From page 1

She thanks A.I. for the latest venture in an era of data-driven agriculture. In 2023, the U.S. Department of Agriculture (USDA) invested \$20 million [into a climate-based A.I. project](#) under the leadership of the University of Minnesota, one of several A.I. agriculture projects funded by the federal government. In the Tar Heel state, the North Carolina General Assembly invested \$1 million in an A.I. partnership between A&T, [North Carolina State University, and analytics firm SAS](#).

The firm deployed an A.I. platform [for the agriculture departments of both schools](#) in March 2024. SAS' principal advisor, John Gottula, says the platform, used by 14 HBCU programs, has helped researchers make more precise and faster conclusions. "It breaks down that silo between people who know the subject matter and people who know the data science," he said.

"Subject-matter experts are now able to query that data and crunch those numbers in a meaningful way, where they can quickly recognize what's realistic and what's not."

Sharma conducts research on fresh market tomatoes, industrial hemp, and hot peppers at an environment-controlled greenhouse and outdoor field, which has natural changing conditions on a farm just a few miles away from A&T's campus. With attached sensors, students under the professor's leadership measure air temperature, carbon dioxide levels,

and water uptake.

The data is then fed into the SAS platform, which assists Sharma with making crucial predictions and gives her the capacity to "generate hundreds of models at one time." Before the technology was introduced, Sharma said she and other researchers were forced to do "blind average applications," having to decide on one nitrogen or water level rate to apply on the entire field. Now, with the use of A.I., she is able to map her field out and give distinctive amounts of water, nitrogen, or fertilizer to plants in need, something that will also help many local farmers. "It's not just environmentally sustainable because we are not polluting our waters, but it is also helping farmers with the money," Sharma said. "They are not overspending on fertilizers that are not helping their crops in any way."

According to HBCU Buzz, the USDA has invested in other HBCUs nationwide to advance their agriculture programs. In May 2024, the agency announced a \$30.8 million investment as part of a commitment to all 19 land-grant HBCUs. As a collaborative effort with the National Institute of Food and Agriculture's 1890 Institution Teaching, the Research and Extension Capacity Building Grants Program will support scientific research to address some of the country's growing agricultural challenges.

Goswami named NIFA's new IYFC deputy director

Dr. Rubella Goswami joined the USDA NIFA Institute of Youth, Family and Community (IYFC) as deputy director on Aug. 25. Previously, she served as the division director for Plant Systems-Protection at the Institute of Food Production and Sustainability, where she was also a National Program Leader.

With over 25 years of experience across academia, industry and government, Goswami has a distinguished career in research, Extension and education. Before returning to USDA NIFA, she was an assistant director for National Identification Services with Plant Protection and Quarantine. She was chief of the Plant Pest and Protectants Branch within Biotechnology Regulatory Services at USDA's Animal and Plant Health Inspection Service.

Her professional journey includes faculty positions at North Dakota State University and Delaware State University and a role in Global R&D with DuPont Crop Protection.

Goswami earned her doctorate from the University of Minnesota, a master's degree from the University of Nottingham, United Kingdom and an undergraduate degree in agriculture from Banaras Hindu University, India. She is a respected scientist committed to teaching and workforce development. Her extensive experience includes working with 1862 and 1890 land-grant universities, underscoring her dedication to the public land-grant system and its tripartite mission of teaching, research and Extension. Her leadership credentials are further supported by certifications in Six Sigma, Corporate Leadership, and Lead 21 (Leadership for the 21st Century).



DR. R. GOSWAMI

Mcgee awarded a 16th patent for COVID 19 air sanitization/isolation system

In recognition of the ongoing presence of COVID-19 and the continuous need for effective measures to mitigate its spread, Dr. Charles Magee, a retired professor of biological systems engineering at Florida A&M University, has been granted a significant patent (No.12,053,562). This patent represents a crucial advancement in reducing the transmission of the coronavirus and other

viruses. To learn more about this groundbreaking patent, visit the U.S. Patent and Trademark Office's official gazette at this link: <https://patentsgazette.uspto.gov/week32/OG/patent.html>. Once on the site, enter the patent number "12,053,562" in the search field on the left side of the screen for detailed information.



DR. CHARLES MAGEE



WVSU opens new greenhouse

West Virginia State University (WVSU) recently held a ribbon-cutting ceremony to officially open its new Agriculture Environmental Sciences Greenhouses, funded partly by USDA NIFA's 1890 Facilities Grants Program and Evans-Allen Research Program. The state-of-the-art greenhouses will provide valuable space for faculty and students to engage in cutting-edge agricultural research.

Insert image—Matt Browning, USDA NIFA; Bob Rimol, Rimol Greenhouses; Ami Smith, Vice President and Dean & Director for Agricultural Research and Extension, WVSU; Ericke Cage, President, WVSU. (Image courtesy of West Virginia State University.)

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1890 Land Grant Universities

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ARD Updates is published monthly by the Association of Research Directors. To suggest articles, contact Dr. Alton Thompson at athompson1@ncat.edu

NEW APPOINTMENTS

BERNARD, MARCUS, dean, College of Agriculture, Health and Natural Resources, Kentucky State University, effective Aug. 14.

JOB OPPORTUNITIES

SOUTHERN UNIVERSITY SYSTEM, Department of Agricultural Sciences and Technology, [Assistant/Associate Professor of Agricultural Economics](#).

PROGRAM SPECIALISTS, Office of Partnerships and Public Engagement, Department of Agriculture, Multiple Locations (Alabama A&M University; Alcorn State University and University of Arkansas at Pine Bluff).

TUSKEGEE UNIVERSITY, College of Agriculture, Environment and Nutrition Sciences, [Climate-Smart Project Associate](#) and [Agroforestry Project Coordinator](#)

PRAIRIE VIEW A&M UNIVERSITY, Cooperative Agricultural Research Center, [Veterinarian](#)

PRAIRIE VIEW A&M UNIVERSITY, Cooperative Agricultural Research Center, [Research Associate/Professor and the Director of the International Goat Research Center \(IGRC\)](#)

WEST VIRGINIA STATE UNIVERSITY, WVSU Research & Development Corporation, [Associate Dean/Associate Director for Research](#)

LANGSTON UNIVERSITY SHERMAN LEWIS SCHOOL OF AGRICULTURE & APPLIED SCIENCES, [Associate Professor of Biosystems Engineering/Precision Agriculture](#), [Associate Extension Administrator](#)

LINCOLN UNIVERSITY OF MISSOURI, [Director of Agricultural Communications](#). Contact the Search Committee Chair, [Dr. Douglas LaVergne](#) with questions.

LOYOLA UNIVERSITY, [School of Environmental Sustainability, Food Systems and Sustainable Agriculture, Post Doc](#).

KENTUCKY STATE UNIVERSITY, SCHOOL OF AGRICULTURE, HEALTH & NATURAL RESOURCES [Assistant Professor position for Integrate Pest Management](#); [Assistant Professor of Organic Agriculture](#); [Assistant Professor of Forestry](#); [Assistant Professor of Livestock Nutrition](#)

PRAIRIE VIEW A&M UNIVERSITY, COLLEGE OF AGRICULTURE, FOOD AND NATURAL RESOURCES, [Associate Professor or Professor & Associate Dean](#)

FORT VALLEY STATE UNIVERSITY, COLLEGE OF AGRICULTURE, FAMILY SCIENCES AND TECHNOLOGY, [Assistant Professor of Animal Nutrition](#)

UNIVERSITY OF MARYLAND EASTERN SHORE, [Associate Dean of 1890 Programs and Associate Director of UMES Agricultural Experiment Station](#)

KENTUCKY STATE UNIVERSITY, SCHOOL OF AGRICULTURE, HEALTH & NATURAL RESOURCES, [Assistant professor position for Integrate Pest Management](#); [Assistant Professor of Organic Agriculture](#); [Assistant Professor of Forestry](#); [Assistant Professor of Livestock Nutrition](#)

CALENDAR



2024 agInnovation Fall Meeting | Theme: "Reimagining the Land-grant University and Industry Relationship"
Registration is live and can be accessed on the [conference webpage](#). If you have any questions regarding registration, please contact the Office of Professional Development at ContinuingEducation@ncsu.edu or 919-515-2261. For all other questions contact Cindy Morley cmorley@uark.edu.

SAVE THE DATE

2025 CARET/BAA Washington Conference | Feb. 23-26, 2025, The Watergate Hotel, 2650 Virginia Ave. Washington, D.C. | The meeting will feature food and ag thought leaders, advocacy presentations, networking with BAA stakeholders, and opportunities to connect with champions on the Hill.

