USDA partners with Central State University on climate-smart initiatives.

ARD UPdates

ASSOCIATION OF 1890 RESEARCH DIRECTORS

January 2023, Vol. 14, Issue 1

Message from the Chair
DR. LOUIS WHITESIDES

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Dear Friends and Colleagues:

Happy New Year!

During these first days of 2023, I've reflected on the essential roles of family, friends, supporters and ARD members. Please know of my gratitude for the vital role each of you plays in ARD's journey to significance and relevance.

I want to thank you all one more time for allowing me to serve as ARD Chair as we continue to strengthen the research capacity within the 1890 system to conduct and support research that builds knowledge in ways that respect and benefit the people and sustain the communities in the 1890 region. I also want thank our past chair, Dr. Chandra Reddy, dean, director and Extension administrator at Tennessee State University, for his visionary and value-based leadership for the past three years. The COVID pandemic challenged us in many ways but, under Dr. Reddy's leadership, we were able to find creative ways to work together and move forward.

During 2023, ARD will continue its commitment to preparing NEXTGEN leaders, investing in our communities and addressing local, regional and national challenges in the food and agricultural sector. Researchers at the 1890 universities will continue to push the boundaries of discovery and drive practical solutions that our nation and our world need now. We remain committed to working to ensure a region and a world with a safe and plentiful supply of food, fiber and water for all, where natural resources and businesses are managed in ways that are sustainable, serve the public good and provide innovative solutions to global challenges.

As we continue to strive for excellence, please know of my gratitude for the important role each of you plays in achieving ARD's mission and vision. As I communicated last month in *ARD Updates*, ARD, in 2023, will focus on:

- being persistent in advocating for our research and education priorities in the FY 2024 appropriations priorities (16% increase for the next five years [*11.25 percent approved*]);

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1890s receive increases in 2023 budget

Last month, the fiscal year (FY) 2023 "Omnibus Spending Bill" ($1.7 trillion) was passed by the U. S. House and Senate and signed by President Joe Biden. This legislation will fund the federal government between now and Sept. 30.

The omnibus appropriations bill provides $1.701 billion for NIFA, an increase of $64 million over FY2022. The bill includes $1.094 billion for Research and Education Activities, $565 million for Extension Activities, and $41.5 million in Integrated Activities. The bill includes an increase for AFRI of $10 million (2.2% increase), funding the program at $455 million. The explanatory statement encourages USDA to prioritize funding in AFRI for agro-acoustics, organic transitions, career and technical training opportunities for meat processing and the Sustainable Agricultural Systems grants.

As depicted in the table below, the 1890 institutions were funded quite favorably as we strive for equity. From FY 2021, the Evans Allen Research Program received an increase of 21.9% while 1890 Extension received an increase of 16.1%. The percent increases from FY 2022 to FY 2023 were, respectively, 11.3 and 10.8.

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1890 Research, Education and Extension Activities	FY '21	FY '22	FY '23
(All $Millions)	Final	Final	Final
1890 Research (Evans Allen Program)	73.000	80.000	89.000
1890 Extension Services	62.000	65.000	72.000
1890 Education Grants	26.000	28.500	30.000
1890 Facilities Improvement	21.500	21.500	21.500
1890 Centers of Excellence	10.000	10.000	10.000
1890 Scholarships	10.000	10.000	10.000

1890s HAVING AN IMPACT

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.

Below is an example of impacts from the 1890 research program submitted by scientists at North Carolina A&T University and the University of Maryland Eastern Shore.

A&T investigates essential oils to control insects and mycotoxins in organic corn

Impact - Essential oils could be an eco-friendly alternative to commonly used pesticides to control insects and mold in stored organic corn. Transforming this result to a large scale could contribute to food safety, security and environmental health.

The production and safe storage of corn not only affect the human food supply (corn flour/meal, corn oil and corn starch), but also affect animal food production because most of the corn grown in the U.S. is used as animal feed. However, insect invasion and mold growth cause significant loss of grains during storage. Mold growth produces mycotoxins which are extremely harmful to human and animal health. It was estimated that 1% to 5% of stored grain in developed countries and 20% to 50% of stored grain in developing countries are lost due to insect damage. Moreover, due to a high level of toxicity, farmers and grain processors are not allowed to use synthetic pesticides in organic grain to protect it from insects and mold. The loss of grain to insects and mold contamination during post-harvest is therefore a big issue for both farmers and grain processors. This research aims to use an environmentally friendly way to control insect and fungus damage in organic corn.

A researcher at N.C. A &T studied the effectiveness of five essential oils (cinnamon, clove, oregano, orange terpenes, thyme) in controlling insect infestation. These oils were selected because they are categorized as General, Recognized as Safe (GRAS). First, they studied how the oil could destroy the maize weevil, an insect that develops in a corn kernel and can cause tremendous damage in corn after harvest when stored in elevators or bins. Based on the results for insecticidal, the researcher selected four essential oils for fungicidal treatment. Researchers simulated fumigation in the lab by attaching a cotton ball to the lid of a small container of grain and adding the essential oil to the cotton ball, which releases the vapor. The containers were then stored in a temperature-controlled environment.

Dr. Jianmei Yu in her lab at N.C. A&T.

The lab-based research showed, all the essential oils were effective in controlling the maize weevil and mold in the stored organic corn. Though almost all the essential oils worked, cinnamon, thyme and clove proved most effective in controlling insecticide and fungicide effects without any change in the shelf life of organic corn. And at the same concentration, cinnamon oil showed the highest maize weevil mortality.

Future questions for research include transforming this lab-based research to a large scale to safely store organic corn such that it could be beneficial to farmers and grain processors.

For more information contact: *Dr. Jianmei Yu, (336) 285-4861. This project was supported by the Evans-Allen Program of the USDA's National Institute of Food and Agriculture (NIFA).*

Improve cattle health by understanding galectins, says A&T researcher

Impact - Understanding the role of galectin on cattle to fight disease could improve management, breeding, diagnosis and treatment of cattle.

Animal products contribute more than $43 billion annually to agricultural trade in the United States. However, cattle, goats and sheep diseases represent an obstacle to profitable animal production and animal welfare. Infectious diseases lead to financial and agricultural losses impacting farm profitability. For example, the U.S. is the world's largest milk producer and produces around 14.6% of the world's milk. Diseases such as mastitis cost the U.S. dairy industry about $1.7 to $2 billion annually.

A major issue in sheep and goat farming is parasites. Growers use drugs to control parasites. The use of drugs leads to issues in food safety, animal well-being and drug residues in food and the environment. Therefore, it is imperative to better understand these animals and the natural

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UMES researcher studies hemp pest management

The Agriculture Improvement Act of 2018 removed hemp with < 0.3% delta-9-tetrahydrocannabinol (D9THC) from the controlled substance list, which allowed hemp to become a legal agricultural commodity. As a result, many states launched an industrial hemp research pilot program that required farmers growing hemp to partner with their departments of agriculture or a university. Since 2019, several farmers in Maryland have partnered with seven universities on hemp research. Unfortunately, despite some success growing hemp, farmers encountered several unexpected pest issues.

Dr. Simon Zebelo in his lab at the University of Maryland Eastern Shore.

Issue Statement (What is the Problem?)

Though hemp is a host for a wide range of arthropods (e.g., Eurasian hemp borer, cannabis aphid, hemp russet mite), the corn earworm (CEW), *Helicoverpa zea*, emerged as a key insect pest in the Mid-Atlantic and southeastern U.S. The CEW feeds primarily on hemp flowers and tunnels into the floral structure, causing plant tissue wilting and mortality. This damage can reduce grain, fiber and cannabinoids yield. The CEW infests hemp at the flowering stage.

Notwithstanding, hemp enters its reproductive stage from late August through late September, during which there are less than 14 hours of daylight on the Delmarva. This timing occurs when alternate CEW host plants (corn and soybean) may not be at a stage congenial to CEW oviposition. Hemp farmers face several challenges in developing an effective pest management program for CEW and other pests. These include, but are not limited to, a lack of recognition and knowledge of hemp pests and effective management tools. Moreover, not many agrichemicals are registered for hemp. Included are some naturally derived biopesticides and oils. Among available products, only a few have shown some effectiveness against CEW.

Program design (What has been done?)

The project had the following three objectives: i) monitor CEW moth catch using a pheromone trap, correlate with larval presence in the hemp fields, and compare larval density, ii) assess the host preferences of CEW using different hemp varieties and another alternative host (corn), and iii) examine the effect of CEW damage and other arthropods on the level of Terpenoid, CBD and D9THC content.

The two-choice oviposition assay results showed a significantly higher number of CEW eggs laid on the two hemp varieties than corn plants, indicating CEW prefers hemp over corn plants. In addition, the two field experiments' results showed high corn earworm preference among cultivars and observed high larval density. Interestingly, a lower number of CEW larvae was recorded on the Mountain Mango variety in the Stewart Neck and Sudlersville fields in 2020 and 2021. Plant damage scores were statistically different between varieties in 2020 and 2021. However, the plant damage score on the Double Lime hemp variety tended to be higher than the two hemp varieties at the Sudlersville fields in 2021. Even if there were significant differences among varieties in both areas in 2020, the damage was minimal. Interestingly, a high number of adults were collected from Heliothis pheromone traps starting from the end of August to the first week of September in 2020 and 2021. Instantly, the number of CEW larvae increased drastically, indicating the time at which hemp plants are highly attractive to CEW moths.

In a laboratory trial, the CBD hemp varieties, Cherry Blossom and The Wife were subjected to herbivore damage (HD), mechanical damage (MD) and control. After 24 hours of observation, herbivore-damaged hemp plants were compared to the control plants. Cannabinoids were extracted from all the samples and analyzed by Gas Chromatography Flame Ionization Detection (GC-FID).

Outcomes (What are the results?)

The laboratory and field results indicated that the CEW preferred hemp plants to corn plants for oviposition. Similarly, the field trial recorded significantly reduced damage on the Mountain Mango hemp variety more than the

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Experiment Station Section announces 2023 awards criteria

The Experiment Station Section, chaired by Matt Wilson, associate director of the West Virginia Agriculture and Forestry Experiment Station, is delighted to issue the following calls for award nominations:

- **2023 ESS Excellence in Leadership Award** – nominations due to Regional Association offices by Feb. 1.
- **2023 ESS Excellence in Multistate Research Award** – nominations due to Regional Association offices by close of business Feb. 28.

Please click on this link to assess the formal call for nominations, including the steps to apply.

Note that the criteria for the excellence in multistate research award has been modified, and while repurposing of previous nominations is acceptable, nominations will be evaluated according to the most recent guidelines and must include a statement indicating advance/changes made to the previous nomination in the transmission correspondence.

All nominations should also include documents illustrating how the project addresses at least one of the ESCOP Grand Challenges.

Please consider nominees for both of these calls within your institution or region and distribute accordingly. Also available in the above link is an example is the award-winning nomination from the 2022 national competition.

NIFA reflects on 2022, efforts to strengthen 1890s

Happy New Year! As NIFA looks forward to a terrific 2023, the agency is also celebrating a stellar 2022. Last year, NIFA continued its growth as a strong, vibrant and agile agency. Even while working to enhance existing programs, NIFA professionals managed an influx of new funds supporting the American Rescue Plan Act (ARPA), the Infrastructure Investment and Jobs Act and the Inflation Reduction Act.

The agency awarded more than 2,500 grants in 2022, totaling $2.2 billion for a diverse and inclusive community, and supported USDA's strategic goals of addressing climate change; creating more, better and new market opportunities; tackling food and nutrition security; and advancing racial justice, equity and opportunity.

NIFA-supported research at Minority-Serving Institutions (MSIs) has led to scientific breakthroughs benefiting minority farmers, stakeholders of the 1890 land-grant university (LGU) system and the nation as a whole, while scholarships and other student-focused programs are ensuring outstanding students at MSIs can pursue and complete degrees in the food and agricultural sciences and related fields.

Last year, NIFA oversaw $194 million in competitive and capacity grants to 1890 LGUs, including $26 million in capacity building grants, $17 million in student scholarships, and $7.6 million to fund 1890 Centers of Excellence. An overall investment of more than $15 million in Centers of Excellence at 1890 LGUs is funding six collaborative research centers focused on subjects ranging from rural prosperity and climate-smart technology to food security, health and nutrition.

These investments will strengthen efforts at various HBCUs in developing research, workforce development and Extension programs that support underserved producers and the communities they serve.

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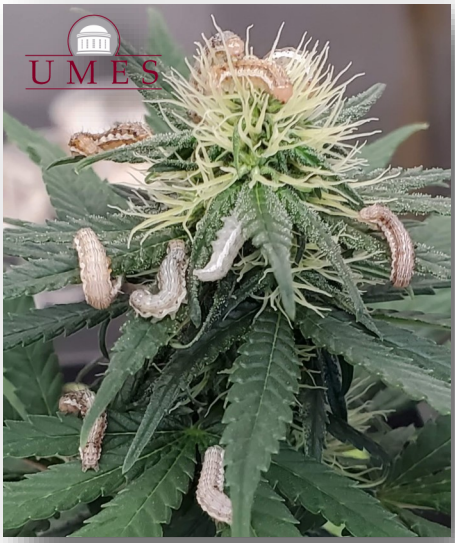
other. Furthermore, spraying hemp with an approved pesticide for CEW starting early in August might help reduce damage caused by the huge larvae population recorded in September and early October in the Delmarva region.

Our results suggest that CBD hemp plants are exposed to insect herbivory spikes in cannabinoid production and surpass the 0.3% legal limit of D9THC. The increased concentration of CBD and D9THC observed in herbivore-damaged hemp plants might be associated with the deterrence of the CEW larvae. Moreover, studies on the impact of other biotic stressors, such as plant pathogens and sucking insects, and abiotic stressors, such as drought, nutrient deficiencies, temperature and soil salinity in the level of essential cannabinoids, need to be done to substantiate the results of this study further.



For additional information, contact*: Simon Zebelo, Ph.D., associate professor of entomology and plant biology, IR-4 Project Northeast Region director, UMES Center for Integrated Pest Management director, Department of Agriculture, Food and Resource Sciences, Department of Natural Sciences, School of Agricultural and Natural Sciences, University of Maryland Eastern Shore, sazebelo@umes.edu, 410-651-6163.*

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- being persistent in advocating for the 1890 priorities and programs in the 2023 Farm Bill; (i.e., research and Extension capacity programs; capacity building grants programs; facilities grant programs; centers of excellence; scholarships for students at 1890 institutions and authorization to pay tuition for graduate research assistants in our Evans-Allen Program);
- supporting supplemental funding for critical infrastructure for colleges of agriculture at land-grant universities;
- working diligently on our multistate, multidisciplinary climate resiliency initiative;
- working collaboratively with and have at least one business meeting each year with the Southern Association of Agricultural Experiment Station Directors;
- strengthening our relationship with NIFA and other USDA agencies; and
- conducting a salary study of the 1890 research directors.

By now, you should have completed your arrangements for our upcoming joint meeting with AEA that will be held on Jan. 23 –26, at the Sonesta Resort Hilton Head Island, SC. The agenda (forthcoming) will provide an opportunity for AEA, ARD and the deans to meet jointly, to have separate business meetings, to hold joint meetings with representatives from NIFA and other invited food and agricultural science scholars, to discuss funding and program opportunities, the farm bill, the federal budget, advocacy, the scholarship program, centers of excellence and the 1890 integrated, multistate climate resiliency proposal.

As I conclude my first message of this New Year, I want to emphasize that ARD is poised to accomplish its strategic agenda, '**bold** Transformations 2025." We are grateful for faculty and staff who care about the success of our students and the life quality of the persons in the 1890 region. Take a moment to **reflect** upon your connection with ARD and the impact it has made on the research and education enterprises. Continue to be committed to collaborating with and supporting ARD as we work together to solve the grand challenges in the food and agricultural sector. We need to partner strategically both within and outside the 1890 system to tackle the challenge areas vital to the sustainability of food and agriculture. Only together can we inspire current and future generations to work to ensure national and global food security.

Thank you for supporting ARD this year as we continue to conduct innovative research to address food and agricultural challenges. We look forward to continuing this exciting work in 2023.

Galectins . . . From page 2

treatments for their diseases.

This project aims to gain knowledge on how the natural and innate immune systems help cattle fight disease. Such knowledge can lead to better breeding strategies to benefit research and the state's dairy industry.

The study involved cows, sheep and goats at the N.C. A &T University Farm. Parasite- resistant sheep, goats and cows were selected to study gene expression at the transcription (RNA) and protein levels. The microbiomes were studied using fecal samples to examine gut health. Both parasites and microbial diversity were analyzed in the gut. Finally, the research data was analyzed using statistics and bioinformatics.

Dr. Mulumebet Worku at the NC. A&T University Farm.

The results showed that the animals have innate compounds like galectin variants and aalectin proteins which have different molecular signatures or different pathways to affect the animals and fight the disease. Also, the results showed we can either block the action of Galectins or modulate them for preventing and treating a range of infectious diseases. Moreover, this research helped to understand Galectins and their role as novel regulatory checkpoints to treat the disease naturally in cows, sheep and goats. Researchers at A&T are continuously working to understand the role of galectin on cattle to fight disease. The team is now working to understand the fundamentals of ruminant galectin gene regulation and function in relation to genetic diversity and immune modulation using garlic as an alternative antimicrobial and immune modulator to improve animal health and production.

For more information contact: Dr. Mulumebet Worku, (336) 285-4816. This project was supported by the Evans-Allen Program of the USDA's National Institute of Food and Agriculture (NIFA).

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1890 Land Grant Universities

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

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

Budget . . . From page 1

From FY 2021, the Capacity Building program (Education Grants) received a 15.4% increase while the 1890 Facilities Program received maintained stable funding. The percent increases from FY 2022 to FY 2023 were, respectively, 5.3 and 0. In addition, the 1890 Centers of Excellence and the 1890 Scholarship Program received stable funding ($10 million). Overall, there was an overall **$17.5 million increase** in funding for the 1890 land grant universities.

The 1890 community would like to thank our congressional champions, including but not limited to, Reps. **David Scott (GA), Sanford Bishop (GA), Alma Adams (NC)** and Senators **Sherrod Brown (OH)** and **Raphael Warnock (GA)** and others for supporting equitable funding for the 1890 land-grant universities.

JOB OPPORTUNITIES

DEPARTMENT HEAD, ANIMAL AND DAIRY SCIENCE, MISSISSIPPI STATE UNIVERSITY
For additional information or questions, contact: Dr. Scott Willard, Director - Mississippi Agricultural and Forestry Experiment Station, Dean - College of Agriculture and Life Sciences, or (662) 325-0233.

VIRGINIA TECH, ASSOCIATE DEAN AND DIRECTOR OF VIRGINIA AGRICULTURAL EXPERIMENT STATION (VAES), Blacksburg, Virginia, Details can be found here. Applicants can also apply directly to the VT job site here.

The **FOUNDATION FOR FOOD & AGRICULTURE RESEARCH** (FFAR) has two job opportunities. Scientific Program Director for Advanced Animal Systems and Health-Agriculture Nexus. The positions are **fully telework/remote**. More information can be found in the PDFs on the FFAR website.

UNIVERSITY OF MARYLAND EASTERN SHORE, School of Agriculture and Natural Resources.
Assistant or Associate Professor: Bioinformatics and/or Biostatistics
Assistant or Associate Professor: Precision Agriculture
Assistant Professor of Biology: Cell Biology/Immunotoxicology/ Metabolism
Assistant or Associate Professor: Fashion Merchandising and Textiles Program
Assistant or Associate Professor: Nutrition and Dietetics
Assistant Professor and Agribusiness /Resource Economist Specialist
Chair, Department of Agriculture Food Resources Science

PRAIRIE VIEW A&M UNIVERSITY, College of Agriculture and Human Sciences
Research Associate Professor (Ruminant Nutritional Physiology) (myworkdayjobs.com)

NORTH CAROLINA STATE UNIVERSITY, College of Agriculture and LIFE SCIENCES, Dean and Executive Director of Agricultural Programs

OREGON STATE UNIVERSITY, Director of the Mid-Columbia Agricultural Research and Extension Center in Hood River, OR. The closing date is Feb. 10.

CALENDAR

Joint AEA-ARD Meeting | Jan. 23-26, 2023, Hilton Head, South Carolina

SOUTHERN ADMINISTRATIVE HEADS SECTION | Winter meeting | Feb. 6, from 11 a.m to 3 p.m. | Omni Oklahoma City Hotel. Part of the Southern Association of Agricultural Scientists (SAAS) conference. Hotel and conference details. The conference hotel rate is $164 + tax and reservations here, by Jan. 20, 2023.

2023 ACADEMIC PROGRAMS STAFF DEVELOPMENT WORKSHOP & ACADEMIC PROGRAMS SECTION (APS) Winter Meeting | New Orleans, Louisiana | Feb. 8 – 10, 2023

AG. OUTLOOK FORUM | Feb. 23-24, 2023 | Registration open.

2023 JOINT CARET/AHS MEETING | Ag is the Answer: Building Land-Grant Solutions to Global Food, Agriculture and Resource Challenges | March 12-15, Omni Shoreham Hotel, Washington, DC

MANNRS CONFERENCE | April 13-16, 2023 | Additional Information.

HBCU ENGAGE |April 18-19, 2023| Nashville, TN. Registration open.