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COLLEGE OF  
AGRICULTURE,  
FAMILY SCIENCES  
AND TECHNOLOGY

# ENGage2020





Employees Taylor Sturn (left) and Kyler Palms (right) work alongside Sweet Valley Bakery and Farmstand owner Dr. Hamidah Sharif-Harris.

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**Dr. T. Ramon Stuart**

*Provost and VP for Academic Affairs*

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**A new TerraSentia robot from EarthSense Inc. is helping Fort Valley State University research assistant professor Dr. Somashekhar Punnuri and his team improve studies on sugarcane aphid.**

# FROM THE PRESIDENT

The year 2020 has allowed many higher education institutions to experience unprecedented circumstances and unforeseen challenges, leaving them in unfamiliar territory. During these critical moments, we are proud that education and research at Fort Valley State University have continued to thrive and excel during this global pandemic and social unrest.

It is with admiration and esteem that I present to you the 2020 Agricultural Research Report, Engage. This publication shows the dedication, diligence, scholarship, and devotion of our agricultural research faculty, staff, and graduate students.

In this issue, research is presented about topics such as whiteflies, turmeric, and food safety. Moreover, the report highlights facility upgrades for the College of Agriculture, Family and Consumer Sciences and Technology. These upgrades enhance the learning experience for our students and improve the research capacity of our faculty and students.

The efforts and accomplishments highlighted in this publication should be shared among agricultural and food scientists, as well as students interested in graduate studies in agriculture. Our goal is to show our impact in the discipline, connect scientists with experts at our university, and to attract students to quality programming with unique opportunities.

Furthermore, our commitment to research, teaching, and outreach is exemplified throughout this publication. As an 1890 Land-Grant University, we take pride in our mission and seek opportunities to continuously improve and innovate so we can be relevant to our local community, state, and beyond.

As president, I am continually thankful for your support and commitment to our institution. I hope you enjoy the information within this publication and that you share it with friends, alumni, and all those who want to see Fort Valley State University succeed.



*Respectfully,*

**Paul Jones, PhD**

President

Fort Valley State University

# PROVOST'S MESSAGE

Greetings:

As Provost and Vice President for Academic Affairs at Fort Valley State University (FVSU), it is my great pleasure to welcome you to the 2020 Agricultural Research Report, Engage.

Since 1895, FVSU has established and maintained a reputation as an innovative, forward-thinking, and resourceful institution. The exceptional efforts put forth by our faculty, staff, and students allow us to effortlessly uphold FVSU's mission of teaching, research, and outreach, while simultaneously demonstrating our commitment to educating each new generation of graduates and leaders, addressing global agricultural challenges, and providing the community with essential services.

In recent months, FVSU's ability to advance our teaching, research, and outreach mission has been tested as a result of the challenges associated with the COVID-19 global pandemic. However, we have used this opportunity, in true Wildcat fashion, to conceive and innovate exciting solutions to pressing challenges. We have remained committed to and engaged in our students' education, both virtually or face-to-face. Furthermore, we have been able to continue progressing our cutting-edge research, while also ensuring the health, safety, and security of the entire Wildcat family.

As you peruse this report, I am confident you will be impressed by the hands-on opportunities available to our students pursuing degrees in agriculture. You will also learn about the pioneering work being conducted by our scientists in myriad specializations. I am so pleased to share this edition of Engage with you, for truly, the time, talent, and abilities of our second-to-none faculty, staff, and students continues to make FVSU a leader among the 1890 Land-Grant Universities.



*Best wishes,*

**T. Ramon Stuart, PhD**

Provost and Vice President  
for Academic Affairs  
Fort Valley State University

# FROM THE DEAN

Nearly two years ago, I stepped on the campus of Fort Valley State University as dean of the College of Agriculture, Family Sciences and Technology. As one of the oldest colleges at the university, I knew I inherited a prestigious unit equipped with well-respected faculty and top notch students.

I consider it a privilege to serve as a leader of this prominent College, a hidden gem in the state of Georgia. When accepting this position, my goal was to continue with the practices we do well, and to improve the processes where we see challenges, creating opportunities to better serve our students, faculty and stakeholders.

I am delighted to say that in 2020 we have continued to engage in opportunities to impact the world of agricultural and food sciences.

Although this year has brought many challenges, our faculty, staff and students have risen to the occasion and remained stable and productive during 2020; a year filled with pandemonium and ambiguity.

The research presented in this report is conducted by esteemed scientist and students who have won awards and are well respected in their disciplines. Their hard work and resilience are just some of the traits that make serving as dean a rewarding experience.

As you read this magazine, I challenge you to see how scientific research is vital to food production and animal health and to also observe how student interaction and hands-on learning opportunities are serving as rich educational practices that prepare them for the workforce, whether industry or academia.

As I continue to make strides to improve infrastructure as well as revitalize processes for students, please continue to support by sharing opportunities with prospective students, contacting our research scientists for inquiries and using the services provided through the College of Agriculture. Let's continue to tell the world about Fort Valley State University, one success story at a time.



*Respectfully,*

**Ralph Noble, PhD**

Dean, College of  
Agriculture, Family  
Sciences and Technology  
Fort Valley State University

# WILDCAT WARRIOR

## Guiding Exceptional Patients With Care

► *By Latasha Ford*

As the coronavirus disease (COVID-19) continues to impact people's lives, patients with cancer may be at an increased risk for severe symptoms. For this reason, a cancer center in Atlanta, Georgia, is making it their top priority to ensure the health and safety of their patients.

Nicholas Hardeman, a Fort Valley State University Master of Public Health student, serves as a clinical researcher on a multidisciplinary team at the Winship Cancer Institute of Emory University.

Seeing more than 17,000 patients a year, Winship Cancer Institute is Georgia's only National Cancer Institute-designated comprehensive cancer center. It is at the forefront of cancer research, innovation and discovery.

Three months on the job, Hardeman has two years of research experience. He oversees different cancer studies, delegates tasks and guides patients with treatment options or follow-up questions.

"Being there for the patients is my main duty," he said. "Because of our clinical trials, they are receiving some type of therapy such as an IV, chemotherapy or supplement."

His additional duties include entering data and ensuring everything is done correctly.

"There are many hats that I wear, but the main hat that I try to focus on is making sure the patient is comfortable and understands every step of the process. Especially with cancer, you want the patient

to feel confident in knowing that you are doing the best you can to try to help them."

Hardeman said Emory is one of the first organizations in Georgia to respond rapidly to the pandemic and adapt its practices to protect patients and staff. Emory changed its structure and ordered most employees to work from home. They also adjusted clinics, treatment and infusion bays by not allowing patients to bring visitors to minimize patient interaction and promote social distancing.

"I have been able to see the transition firsthand and this has been quite an experience for a public health professional. I can work with my patients and express to them the importance of social distancing, even with their loved ones," Hardeman said. "Dealing with patients who have cancer is a delicate situation, because their immune systems are usually compromised. Everyone who steps inside the facilities are screened and asked if they are at high risk for spreading or contracting COVID-19."

The 2018 Mercer University graduate, who earned a bachelor's degree in global health, said it is truly an experience to work on the front lines of a pandemic. They assist about 80 to 100 patients weekly, which includes about 10 or 20 face-to-face interactions.

"It has been fulfilling to show them that we are still here, and we are still helping out as much as we can in those times of need," Hardeman said. "They also let us know they are grateful for what we are doing. That is very fulfilling to hear those things and see patients get better over time."



*“Being there for the patients is my main duty”*

He said this position fell into his lap as a blessing. Setting an example for his two younger brothers, he said hard work pays off.

“I always knew I wanted to do something in the health care field, but it is amazing how things work out and open up for you. Five years ago, I had no idea that this position even existed,” Hardeman said.

The Atlanta native continues to challenge himself. He said the work he does is important because not only are health professionals in his field able to save and prolong patients’ lives, they also observe a lot of medicines and therapies before they hit the market.

“To have access to that knowledge that could possibly help others is very rewarding,” he said.

The MPH Wildcat, who plans to graduate in May 2020, encourages people to take the COVID-19 pandemic serious.

“To protect the people you care about, or the people you may never encounter, you should follow the guidelines to protect everyone,” he advised.

This experience has taught him that preparation can go a long way.

“As a country, we were not necessarily prepared for this. That can be translated into any aspect of your life. Always be prepared and always be aware of things that could happen,” Hardeman said. “Bad things are going to happen in life no matter what, but you want to be able to adapt to them the best way possible.”

Patricia Doyle of Chester County, Pennsylvania, bottles paulownia honey in her kitchen.



# Paulownia research at Fort Valley State University attracts Northeast farmer

A Parkesburg, Pennsylvania, resident is benefiting from the many uses of a fast-growing crop after searching online for guidance.

Patricia Doyle and her partner, John Kopacz, purchased a small farm in eastern Pennsylvania in 2019. Two acres of the land hold an orchard of approximately 140 large paulownia trees in the lower portion of the property, which the previous owner planted about 20 years ago.

“They were badly overgrown with poison ivy,” Doyle said. “We hand trimmed them and cut back as many of the vines as we could. It was a lot of work, and we still have some work to do.”

With a lack of knowledge about paulownia trees, she was curious to know if there was still a market for paulownia wood, but she received conflicting answers. Native to China, paulownia is a multipurpose crop used for honey, timber, tea, lip balm, medicinal purposes and much more. It is easy to grow for reforestation and could help farmers establish sustainable income.

“Most of the people in my area had never heard of paulownia,” Doyle said. “Then, I found out about the study at Fort Valley State University.”

The Wait & See Farm owner searched online and discovered a story about two FVSU graduate students researching the versatility of this royal express tree. She contacted one of the students who referred her to Dr. Nirmal Joshee, an FVSU professor of plant science.

“Dr. Joshee said the paulownia trees help a lot with greenhouse gases, are good for the environment and

make good honey. So, we decided to keep them,” Doyle said. “When the trees blossom, they have these beautiful purple flowers.”

Joshee, who has more than 15 years of experience researching paulownia, said paulownia honey

is a quality product. With 2,500 paulownia trees on FVSU’s campus, his team of researchers produced 420 pounds of honey several years ago.

“I suggested to her that she could easily produce it as an additional income. Paulownia honey is healthy and helpful for companion crops because of the bees,”



Paulownia tree blooms.

he advised. “I sent her our research publications and recommended that she raise bee colonies.”

After a year, Doyle contacted Joshee to confirm that she took his advice and experimented with making paulownia honey. She purchased approximately 10,000 bees in the spring and harvested her first batch of honey (20 pounds) in June. “The honey was light in color and taste. Everyone I gave it to loved it,” she said.

With plans to expand their small operation, Doyle said her daughter works at a local fudge shop, where the owner is interested in selling her paulownia honey. “It has been received so well and we are really excited about it,” she beamed. “We have sold out our next harvest and have a waiting list.”

The Pennsylvania farmer is grateful for Joshee’s guidance and expertise.

“I would have never known it if it were not for Dr. Joshee. It changed our whole way of how we view that grove of trees,” she said. “We were busy wondering how we could get rid of it. Now, it is the most significant part of our property, and we are working on giving our mature paulownia a healthy environment. I am so grateful for Dr. Joshee’s invaluable work.”

Doyle admitted that she always wanted to keep bees, but she did not know much about them. She



About 140 paulownia trees sit in the lower portion of the Wait & See Farm.

said Joshee encouraged her to do it, and now it is an awesome hobby for her and her family.

“Look at the impact of our research,” Joshee said. “With 1 pound of honey, she could earn at least \$30. Paulownia is a versatile crop and could be a good, consolidated project for farmers. For 10 good weeks, farmers with 5 to 10 acres could easily make \$5,000 to \$10,000, and if they grow it organically, they could earn twice as much.”

For more information about paulownia trees or honey, contact Joshee at (478) 822-7039 or [josheen@fvsu.edu](mailto:josheen@fvsu.edu).





Researchers target a  
**DESTRUCTIVE**  
insect

► *By Latasha Ford*

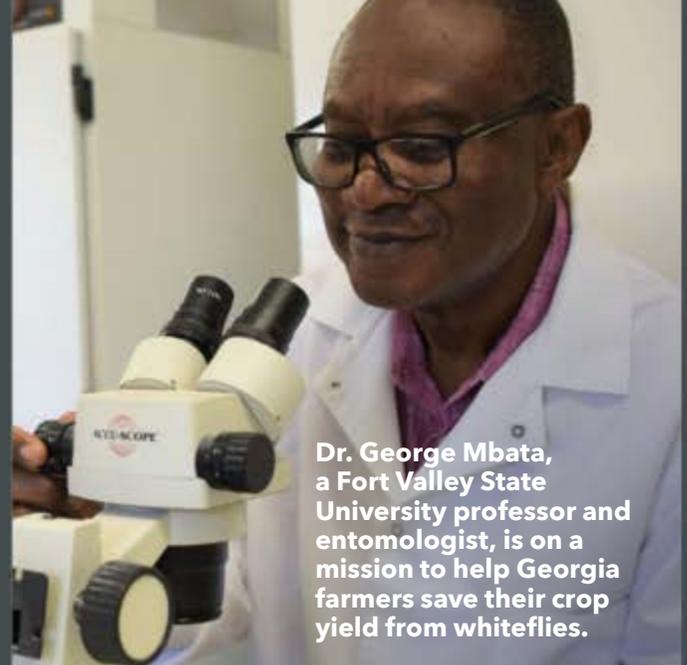
Tiny sap-sucking insects are overtaking Georgia's crops and leaving a trail of destruction behind them.

To combat this outbreak, Fort Valley State University researchers Dr. George Mbata, professor and entomologist; Dr. Somashekhar Punnuri, research assistant professor; and Dr. Yinping Li, postdoctoral entomologist, are investigating strategies to limit these whitefly intruders from wreaking havoc on vegetable production in the southeastern United States, particularly the state of Georgia.

Whiteflies belong to the order Hemiptera, which are called true bugs. "They suck the sap out of plants and transmit pathogens such as viruses that can cause plant diseases, thereby reducing the yield," Mbata said. "When there is an abundant population, it can cause discoloration of the crop leaves. The plants then cannot perform photosynthesis." This causes farmers' crop yield to drop.

One specific strain, the *Bemisia tabaci* whitefly, is prominent in Georgia. "The problem is this particular pest develops a resistance to chemical pesticides very easily," Mbata said.

He added that the rapid evolution of insecticide resistance in whitefly populations makes it unsustainable to use chemical control. Offering his 30-plus years of pest management expertise, the biology professor is collaborating with the University of Georgia (UGA) and the U.S. Department of



**Dr. George Mbata, a Fort Valley State University professor and entomologist, is on a mission to help Georgia farmers save their crop yield from whiteflies.**

Agriculture's (USDA) Agricultural Research Service (ARS) in South Carolina.

In addition, Punnuri will contribute his plant molecular breeding expertise to this research. His role is to identify plant resistant traits in resistant sources in the shortest time using molecular tools. Additional research will include advancing breeding efforts of conventional breeding.

"This information will add to the other researchers' findings and yield suitable varieties that are resistant to whiteflies for this region and for Georgia," Punnuri said. "I am very excited to be part of this grant and a great team to develop these sustainable approaches."

The goal is to characterize whitefly infestations of fruits and vegetables (tomatoes, snap beans and squash) in middle Georgia and provide short-term



**Dr. Yinping Li, postdoctoral entomologist, takes a closer look at whiteflies on a leaf.**



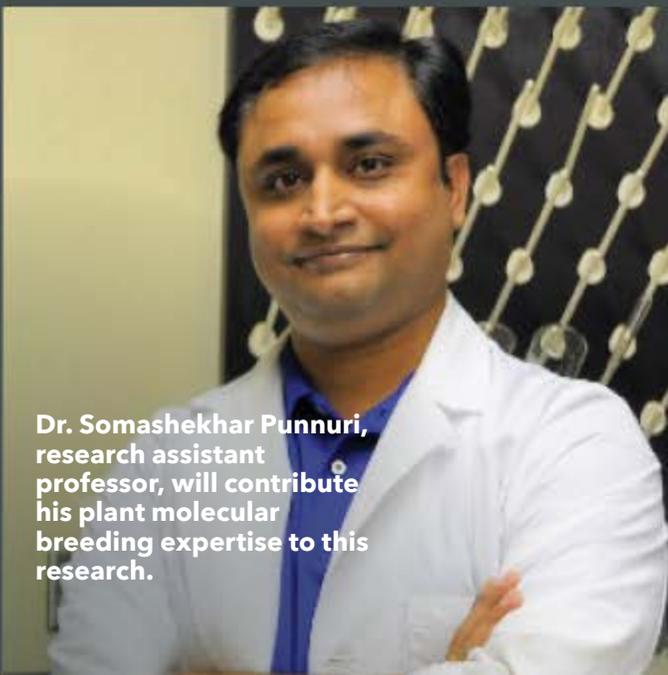
**Mbata and Li work with graduate research assistant Anurag Singh, research associate Sydnee Shaw and students on the off-campus farm to compile data.**

and long-term integrated pest management tools that farmers can use to mitigate infestations.

“Our comprehensive plan is to investigate whiteflies and whitefly-transmitted viruses in vegetable cropping systems from the perspective of an ecology-based integrated pest-plant virus management system,” Mbata explained.

He and Punnuri, along with their collaborators, will develop this system to control whiteflies and whitefly-transmitted viruses by incorporating plant resistance, biorational chemicals, insecticide resistance management, biocontrol and other biotechnology tools.

“We are taking an integrated approach using natural enemies such as predators, parasitoids (wasps) and entomopathogens (fungi or nematodes),” Mbata said.



**Dr. Somashekhar Punnuri, research assistant professor, will contribute his plant molecular breeding expertise to this research.**

Their ongoing research includes screening and evaluating germplasm and hybrids of tomatoes, snap beans and squash for resistance and susceptibility to whiteflies in greenhouses. The scientists are determining strategies for resistance breeding among the selected germplasm and evaluating the efficacy of entomopathogens in the field. During the winter months, the research team will conduct greenhouse experiments on FVSU’s Agricultural Research Station farms.

In recent studies, Li said they found that the promising snap bean varieties that exhibited low susceptibilities to whiteflies include Royal Burgundy, Jade, Golden Rod and Long Tendergreen.

“More studies and analyses will be done to validate the study,” she said. “We observed some strains of entomopathogenic nematodes to be virulent to whitefly on snap bean leaves. With more experiments, we will identify strains that can be integrated in the management of whitefly on snap beans.”

FVSU received a \$732,800 grant for this USDA-ARS project in 2019. The title is “Managing Whiteflies and Whitefly-Transmitted Viruses in Vegetable Crops in the Southeastern U.S.” Funding is for two years, but Mbata anticipates this being a five-year project. This grant also provides an opportunity to exchange and train students and postdoctoral researchers between UGA and FVSU labs.

For more information, contact Mbata at (478) 825-6550 or [mbatag@fvsu.edu](mailto:mbatag@fvsu.edu), or Punnuri at (478) 825-6519 or [punnuris@fvsu.edu](mailto:punnuris@fvsu.edu).



# The golden spice to farm profitability

A nutritious super food that potentially prevents heart disease, Alzheimer's and cancer could add value to small farmers' operations in Georgia.

Turmeric (*Curcuma longa*) is a flowering plant of the ginger family Zingiberaceae. The aim of two Fort Valley State University researchers is to investigate best management practices for regional growers to produce this vivid, yellow-orange spice and possibly improve farm profitability.

Dr. Bipul Biswas, research assistant professor of biotechnology, and research professional Dr. Steven Samuels are using a \$100,000 Specialty Crop Block Grant to aid in their project, "Optimizing Cultivation Practices to Develop Turmeric Production in Georgia." This is a three-year grant (ending September 2022) awarded by the U.S. Department of Agriculture's (USDA) Agricultural Marketing Service (AMS).

"With its suitable climate conditions and available land, Georgia could benefit from promoting



**Turmeric is a vivid, yellow-orange spice that offers multiple health benefits.**

**Above: Biswas (far left) and Samuels (third from right) teach students in the biotechnology graduate program how to grow crops using various hydroponic systems.**

turmeric production as an emerging addition to local agriculture," said Biswas, who serves as principal investigator of the grant.

A native of India, Biswas said Indian and South Asian communities' have been cooking with turmeric

and using it as a natural treatment for centuries. According to his research, the Future Market Insights reported revenue from the global turmeric market stood at more than \$2,700 million in 2012 and more than \$3,160 million in 2016. It could reach a market variation of more than \$5,650 million by the end of 2027. The U.S. turmeric market has tripled over the last half-century, yet most of its production remains in India.

Therefore, to help boost economic stability in Georgia, Biswas and Samuels will conduct field trials to determine the optimal planting date, rhizome size, planting depth and planting density for turmeric



Turmeric grows in a hydroponic system in the on-campus greenhouse.



Drs. Bipul Biswas and Steven Samuels, Fort Valley State University researchers, examine the turmeric growing on Arthur Thomas' (far left) farm in Milledgeville, Georgia, along with his friend, Wilkie Hill (far right).

rhizome biomass and curcumin production. This will also involve examining fertilizer regimens to compare organic and inorganic fertilizers for feasibility purposes. In addition to field trials, they plan to test other growing systems such as in-door farming, shade farming, raised beds and hydroponics.

Another objective is to develop genomic resources to breed high-yielding, disease resistant turmeric varieties for extractions of medically important compounds and food additives. Graduate and undergraduate students will assist with the research and provide hands-on training for community members. Lastly, Biswas and Samuels plan to form a consortium that connects producers and consumers within the food system more closely.

Samuels, who serves as co-principal investigator, emphasized the health purposes of turmeric. "There is a gap between the health of minority groups and other people," he said. "An aspect that we want to promote is the holistic benefits from better nutrition and raising your own crops."

Following their research, the plant experts hope to enhance the competitiveness of specialty crops through greater capacity of sustainable practices. This could result in increased yield, reduced inputs, increased efficiency, increased economic return and conservation of resources. To start the process, they are working with FVSU's Cooperative Extension Program to connect with local farmers.

Arthur Thomas of Humble Farm Refuge in Milledgeville, Georgia, a micro-urban farm that

promotes environmental sustainability, is already reaping the benefits from growing turmeric, ginger and stevia on his less than an acre land behind his house. The Honda Heroes winner met Biswas after visiting FVSU's booth at the 2018 Pan African Festival in Macon, Georgia, where he inquired about planting specialty crops. He planted stevia first. Then, in spring 2019, Biswas recommended that Thomas grow turmeric and ginger on his land because of the quality soil.

Farming most of his life, Thomas encourages entrepreneurship. "Dr. Biswas has given me hope. It is all about getting healthier. That is what inspired me," he said.

Not only is he benefiting from Biswas' expertise, the retired Army veteran is paying it forward by educating others. He and his partner, Dolores Davis of Milledgeville, and friend, farmer Wilkie Hill of Gordon, Georgia, are determined to make a difference and better their communities.

"The reality of it all is to help each other," Thomas said. "Dr. Biswas recognizes the connection between research and grassroots. The more you educate, the more stevia, turmeric and ginger people will consume."

For more information about turmeric, contact Biswas at (478) 825-6827 ([biswasb@fvsu.edu](mailto:biswasb@fvsu.edu)) or Samuels at (478) 825-3134 ([steven.samuels@fvsu.edu](mailto:steven.samuels@fvsu.edu)).



# ROBOTIC TECHNOLOGY aids in research to control a pesky insect

An agricultural robot is giving a team of scientists a better view of a troublesome pest that is disrupting sorghum production in the Southeast.



**FORT VALLEY  
STATE UNIVERSITY**



► By Latasha Ford

An agricultural robot is giving a team of scientists a better view of a troublesome pest that is disrupting sorghum production in the Southeast.

Fort Valley State University research assistant professor Dr. Somashekhar Punnuri said the tiny sugarcane aphid (*Melanaphis sacchari*) has been a nuisance for southern farmers since 2013. This new invasive pest is severely reducing sorghum yield, forage quality and feed consumption. Sorghum is an important, versatile crop in the southern cropping systems, where farmers use it as forage and silage for livestock. In addition, it is valuable for bioethanol production.

For this reason, Punnuri aims to identify genetic resources that are resistant to sugarcane aphid and to strengthen the research capacity in plant breeding activities at the university. As principal investigator, he is collaborating with Drs. Joshua Peschel with Iowa State University and Jason Wallace with the University of Georgia (UGA). Other partners include Drs. Xinzhi Ni, Karen Harris-Shultz, Alisa Coffin and Joseph Knoll with the U.S. Department of Agriculture's (USDA) Agricultural Research Service (ARS) in Tifton, Georgia, and Scott Armstrong with the USDA-ARS in Stillwater, Oklahoma.

Since starting the research process in 2019, they increased capacity for studying plant breeding of the sugarcane aphid, obtained a seed thresher, and installed

a cold storage unit on FVSU's campus for germplasm conservation and enhancement. Coffin and her crew collected drone data for aphid damage and other traits on the sorghum association panel (SAP). Dr. Addissu Ayele, FVSU postdoctoral research associate, also joined the group to assist on the project.

Additionally, Punnuri and his team held a workshop for 50 research and Extension professionals, students and farmers in fall 2019 to discuss strategies for management of the sugarcane aphid in sorghum, insect scouting using robots and plant-insect interaction-related studies. The researchers also conducted field demonstrations, where they trained participants on how to use an agricultural robot in the field.

In July 2020, Punnuri received a new TerraSentia robot from EarthSense Inc. to help improve their studies. He said there were battery and navigation issues with the old robot. However, the new robot contains six high-quality cameras, can withstand hotter temperatures, collects massive amounts of data, and can remain in the field for a longer duration. It also allows them to share the data in real time on cloud services. Dr. Chinmay Soman, co-founder and CEO of EarthSense Inc., helped train Fort Valley and other scientists on how to use this robot in the field for research purposes.

"We are going to modify it for our studies and use this data to identify sorghum genome regions," Punnuri explained. "We are conducting a genome-wide study on a sorghum association panel with a few extra lines identified for sugarcane aphid resistance."

The field-based robot will help increase the precision in phenotyping for sugarcane aphid damage and facilitate accelerated plant breeding. Phenotyping involves quantifying and characterizing a plant's physiological growth and biochemical properties that attribute resistance to the plant. This allows the researchers to investigate the underlying genetic cause of a plant's resistance to the sugarcane aphid.

Punnuri said the plant breeding community lacks the resources to precisely assess the damage caused by this pest. Currently, visual scoring is the only way to assess the pest problem and plant resistance offered.



**Dr. Somashekhar Punnuri, Fort Valley State University research assistant professor, is collaborating with several colleagues across the country to study strategies for management of the sugarcane aphid in sorghum.**

“Sorghum acreage in Georgia has drastically reduced due to this menacing pest, which brings huge losses to sorghum farmers,” Punnuri said. “These farmers need pertinent information on how to control the losses caused by sugarcane aphid while keeping their costs low.”

He emphasized there is a lot to understand about this new pest. “We are seeing good results, and I am hopeful that we will make good progress on this project,” he said. “Phenotyping for insect resistance is difficult and developing such methods will help us provide varieties for breeders and farmers to combat sugarcane aphid problems.”

Upon completion, Punnuri plans to publish this research in a peer review article. He is also working on a USDA-ARS areawide pest management project headed by Ni. They are studying several field plots, and two FVSU undergraduate biology majors are receiving hands-on experience and using the data on sugarcane aphid for their senior research projects.

The USDA’s National Institute of Food and Agriculture (NIFA) awarded Punnuri a \$499,997 Capacity Building Grant (GEOX-2018-04866) to fund the sugarcane aphid project.

For more information, contact Punnuri at (478) 825-6519 or [punnuris@fvsu.edu](mailto:punnuris@fvsu.edu).

Students test out the TerraSentia robot on the off-campus farm.



“Phenotyping for insect resistance is difficult and developing such methods will help us provide varieties for breeders and farmers to combat sugarcane aphid problems.”



# ENHANCING with pulsed UV light

# FOOD SAFETY

► By **Latasha Ford**

A rapid non-thermal technology could be the next processing method for eliminating foodborne pathogens such as *Escherichia coli* (*E. coli*) to improve meat quality and safety.

For her master's thesis, Fort Valley State University biotechnology alumna Madalyn Bryant investigated the advantages of using pulsed ultraviolet (UV) light to inactivate *E. coli* K12 on goat meat and beef surfaces.

Bryant exposed goat meat and beef to different doses of pulsed UV light using a XENON pulsed UV light system (Z-1000) in the food engineering laboratory to determine how effective the pathogen-killing light was against *E. coli*. She found that pulsed UV light can kill up to 98 percent of *E. coli* on goat meat and beef after 60 seconds. She used mathematical models that predicted the survival of the bacteria.

As Bryant's mentor and former adviser, Dr. Ajit Mahapatra, associate professor of food engineering, collaborated with the FVSU graduate and Hema Degala, research assistant in food safety, on this project. Mahapatra explained that applying continuous UV-C (254 nm), pulsed light (170 to 1,000 nm) and pulsed UV light (from 200 to 400 nm) to processing foods is a comparatively new and challenging area. The U.S. Food and Drug Administration (FDA) approved pulsed UV light technology applications in 1996.

"Pulsed UV light is delivered in several flashes per second with an intensity of about 20,000 times more than the intensity of UV light. It has germicidal properties and is known to be effective against bacteria, mold and viruses," Mahapatra said.

He noted pulsed UV light could decontaminate bacteria on contact surfaces, fruits and vegetables, and liquids like milk and juices. He explained that the light passes through the cell wall of the bacteria and attacks its DNA, causing it not to replicate.

Mahapatra encouraged Bryant to publish the results of her thesis after graduating with her master's degree in biotechnology in 2018. For the first time, the



**Dr. Ajit Mahapatra, associate professor of food engineering, collaborated with Fort Valley State University graduate Madalyn Bryant and Hema Degala, research assistant in food safety, on investigating the advantages of using pulsed ultraviolet (UV) light to inactivate *E. coli* K12 on goat meat and beef surfaces.**



**Bryant exposes goat meat and beef to different doses of pulsed UV light using the XENON pulsed UV light system (Z-1000).**



**The FVSU researchers discovered that pulsed UV light can kill up to 98 percent of *E. coli* on goat meat and beef after 60 seconds.**

International Journal of Food Science and Technology (IFST) published research on inactivating *E. coli* K12 by pulsed UV light on goat meat and beef. The project appeared in the July 2020 issue (<https://doi.org/10.1111/ijfs.14733>).

“This accomplishment shows me that I can go far. I put a lot of time and work into this research. However, it was not tiring because it was something that I enjoyed doing,” Bryant said. She attributes her success to Mahapatra and Degala’s support and great mentorship. “Fort Valley is not just a small institution. The research we do means a lot.”

Bryant, who earned a bachelor’s degree in plant science-biotechnology from FVSU in 2016, is now using her research skills serving as a lab manager in FVSU’s College of Arts and Sciences.

“My research experience gave me the opportunity to learn more about how biotechnology is used to enhance all living organisms,” Bryant said. “This enables me to have a better understanding of the different science techniques and systems while in my new position.”

As lab manager, the biotechnology graduate is responsible for organizing and preparing the lower-level biology labs. She also teaches some of the classes.

“I can share my brain and help students. That is what makes me happy to work at this university because I was once in their shoes,” Bryant said.

The Perry, Georgia, native said FVSU was always a choice for her because her mother graduated from the land-grant institution.

“My mom was someone who I always admired. She passed away in 2011 from congestive heart failure. When I saw what she went through, I desired to go to medical school to be a cardiologist because I wanted to help people like my mom,” she said.

Deciding to stay close to home, Bryant became a Wildcat and did a pre-internship in the plant science-biotechnology program, which opened her eyes to the many opportunities in science and agriculture.

“I aspire to continue doing research in my current position,” she said. “Technology is enhancing every day. With research, there is always going to be something new.”

For that reason, Bryant said her research on pulsed UV light is important because food processing plants can incorporate this new method in their facilities to decontaminate meat before it gets to the consumer. Furthering their research, Degala said they need to examine how pulsed UV light affects the sensory properties (taste, color and odor) and combine it with other non-thermal technologies such as essential oils and sonication to see if this enhances the inactivation.

The U.S. Department of Agriculture’s (USDA) National Institute of Food and Agriculture (NIFA) supported this project. FVSU colleagues Dr. Ramana Gosukonda, professor of bioinformatics, and Dr. Govind Kannan, vice president of economic development and land-grant affairs, also contributed to this research.

**For more information, contact Mahapatra at (478) 825-6809 or [mahapatraa@fvsu.edu](mailto:mahapatraa@fvsu.edu).**

# LEVERAGING RESOURCES to serve small farmers

► *By Latasha Ford*

Small farmers are instrumental to the economy and serve a vital role in their communities. Faced with risks that could affect their overall operation, small farmers seek support and resources to cope with these potential threats.

Dr. Xuanli Liu, a Fort Valley State University research associate professor of agricultural economics, is examining risk management strategies to assist small farmers.

“Farming is a business with inherent high risk. Small farmers face production, marketing, financial, human, legal and institutional risks,” he said. “Many farmers work hard all their life, but various risks take their toll. Many of them are struggling to keep their business afloat.”

Liu said a small farmer is someone whose market sales are \$250,000 or less. Looking to help this group of entrepreneurs manage risks, he collaborated with Kennesaw State University faculty to conduct a comprehensive survey of 855 small farmers in Georgia, Alabama, Florida and South Carolina. These experts wanted to learn what level do small farmers adopt effective management tools to prevent, mitigate and cope with various risks. In addition, they wanted to know what factors prevented them from actively getting involved in government programs.

Results from the survey show that many farmers have done a lot to manage risk through diversification,

selecting stable enterprise, using family labors, selling at farmers markets, and off-farm employment opportunities. However, it was also evident that many farmers did not participate in government commodity and insurance programs, and some were unaware these programs existed.

“If we do not pay attention to the issues, more of less protected small farmers will be pushed out of business. These are all big issues. There is no easy solution,” Liu said.

The FVSU researcher suggests that small farmers team up and form farm cooperatives. He said this could help small farmers seize on the economics of scale, provide consistent and stable supply, and facilitate marketing of agricultural products.

“Small farmers need a fair share of support to leverage money in cooperatives,” Liu advised. “We should support small farm cooperatives at least at their early stage. A group of small farmers may have a chance to sell their products to big-box retailers. This is an effective mechanism to reduce various risks, particularly market risk and uncertainty.”

Furthermore, he said the survey revealed that small farmers are concerned about farmers markets. “The market surely helps small farmers, but it is not a stable marketing channel,” he noted. Liu also found that small farmers are more likely to accept information from like-minded people. This caused Liu and his team to consider a more effective approach of risk communication via an exemplar network of farmers.



*There are not many young people wanting to stay in agriculture. Providing the young farmer with more support at an early stage could help. We really need a young energetic generation of farmers emerging in the rural area.*



Another finding is an increasing concern about the younger generations' indifference to continuing the family farming business. Liu said usually elder farmers are risk averse and less likely to adapt to uncertainty in production and market. Therefore, the shortage of young labor forces exaggerates the ramification of risk in agriculture.

“To be a farmer is not an active selection but a passive acceptance,” Liu said. “There are not many young people wanting to stay in agriculture. Providing the young farmer with more support at an early stage could help. We really need a young energetic generation of farmers emerging in the rural area.”

Encouraging active participation, Liu said this project engaged several FVSU students in research activities that exposed them to real-world issues. Students were involved in data management, manuscript drafting and conference presentations. He said not only did they help to accomplish the research objectives, but they improved their class performance as well. Some students also found jobs with companies and

government agencies such as the U.S. Department of Agriculture (USDA).

As this project progresses, Liu intends to initiate more collaborations with officials in local government and federal government agencies.

“The research in need is the one with a broad view, a holistic way of thinking, and ability to locate critical points and leverage resources to overcome the hurdles,” he said. “Emphasizing technological support is good but not enough. What is called for is integrating more economics and management approaches into the solution toolbox for farmers. This is the direction our project is heading.”

The USDA's National Institute of Food and Agriculture (NIFA) supported this \$80,000 project (Evan-Allen project No. GEOX-3225).

For more information, contact Liu at (478) 825-6831 or [liux@fvsu.edu](mailto:liux@fvsu.edu).

# Treating mastitis with *good* bacteria

► *By Latasha Ford*

Treating a common disease that decreases milk production in dairy animals may require fighting off this serious infection with good bacteria.

Mastitis, an inflammation or infection of the mammary glands, can develop in the udder of dairy goats. Due to the negative effects of this disease on herds, Dr. George McCommon, head of Fort Valley State University's Department of Veterinary Sciences, and his team began researching treatment options for mastitis in goats in March 2016. He said with antibiotics, there is a potential for drug residue in the milk and antibiotic resistance in the goats.

"During this five-year project, we have shown that probiotics work. We do not have to worry about drug resistance or drug residue. This research is helpful for the average consumer, as well as farmers and their ability to treat their animals," McCommon said.

The veterinary science professor noted human consumption of goat's milk, due to its health benefits, has increased dramatically. Goat's milk is easier to digest than cow's milk and is less likely to cause lactose intolerance.

McCommon said their research involved collecting samples from hundreds of dairy goats on campus that had mastitis and those that did not have the infection.



First, they cultured the samples and examined how well antibiotics worked to treat the bacteria. Then, they switched to probiotics. To their surprise, they found that several probiotics worked better than others.

"Now we are at the point of fine-tuning our research," McCommon said. "We gradually moved from using a lot of antibiotics to using only a few to using probiotics and no antibiotics."

He noted there are few studies conducted about mastitis in goats. To set the stage for this impactful research, McCommon said it is extraordinary because many people on campus came together to help with samples, and it has been a valuable hands-on experience for 16 Master of Public Health students.

"We were able to give them that background in microbiology," McCommon said.

One of those former students includes Dr. Kingsley Kalu, a research assistant in the Department of Veterinary Sciences. The 2018 alumnus said when he started the program, he learned about the mastitis project.

“I was really impressed with the research because the novel use of probiotics will lead to a reduction in antibiotic resistance to both animals and humans, which is a public health concern,” he said. “My interest in FVSU’s Master of Public Health program was because of the concentration in environmental health, which focuses on the role that animals and the environment play in the prevalence of human diseases.”

Interested in clinical medicine, Kalu is a physician from Nigeria with more than seven years of experience. He said with the vast experience he has acquired at FVSU, he intends to continue doing research in the United States in areas that connect human diseases, zoonotic diseases and the environment, otherwise known as One Health, an emerging area in public health.

“COVID-19 is an example of a viral disease that originated from animals and is now affecting human beings,” Kalu said.

Ultimately, the research assistant aspires to give back the knowledge he acquired as a student and as a researcher to his home country to help prevent diseases.

“With the experience gained from the mastitis project, I had the opportunity to be involved in several ongoing research projects in the department. I am also conducting my own research project, a pilot study on the prevalence of hypertension and obesity among students in rural Historically Black Colleges and Universities (HBCUs),” Kalu said.

In addition to his role as a research assistant, he tutors undergraduate and graduate students on various laboratory experiments and discusses the relevance of environmental health as it relates to public health. He also conducts literature reviews for faculty members’ research projects.

McCommon thanked Kalu and veterinary science professors Dr. Saul Mofya, Dr. Oreta Samples and Dr. Lori Stose for their work on the Evans-Allen project.

“We appreciate the opportunity and the U.S. Department of Agriculture’s (USDA) National Institute of Food and Agriculture (NIFA) for funding it,” he added. “We are at the start of some very good research.”



*During this five-year project, we have shown that probiotics work. We do not have to worry about drug resistance or drug residue... We gradually moved from using a lot of antibiotics to using only a few to using probiotics and no antibiotics.*

# FACILITY Enhancements & Upgrades

To improve and enhance research and learning opportunities at Fort Valley State University, funds from the U.S. Department of Agriculture have helped to upgrade and purchase new equipment. These enhancements are useful in continuing innovative research and practical learning experiences for students and faculty. Check out the latest additions to the campus.



### **Shade cover/shelter**

The shade cover/shelter provides for animal comfort and welfare with protection from extreme sun and rain.

### **Cattle working system**

The cattle working system moves cattle from a catch pen into a sweep tub, then through the alley into the chute. The back part of the chute closes so cattle can't back out. The front part catches on either side of their necks so they can't pull their head out. The sides squeeze helps them feel secure. This is helpful for providing health care for the animals.





### **Catch Pen**

The catch pen is part of the cattle working system. The catch feeders in the catch pen feed the cattle into the system easily.

### **Hay Trailer**

The hay trailer is used to clear fields when a farmer or rancher has to clear fields of round bay hales before moisture ruins them. The trailer can be pulled to the hay shed, filled with round bales, and then hauled back to the pasture. The cattle can then eat directly from the hay which is held off the ground to keep it dry and reduce waste. This also allows the trailer to be moved around so one spot in the pasture doesn't become overly damaged.



### **Portable Small Ruminant Handling Corridor**

### **Mineral Feeder**

A mineral feeder provides loose mineral supplements at all times in this covered area protecting the minerals from getting wet.



# PUBLISHED WORKS

Research at Fort Valley State is published and presented through scholarly journals and shared through presentations at scientific conferences globally. Below is a list of published works and presentations of agricultural research faculty and staff from 2019-2020.

## Bipul Biswas, PhD

### JOURNALS

1. S. Samuels, R. Campbell, B. Biswas. 2020. Geological Agriculture: Accessing River Rock Ability to Support Plant Life grant. Department of Agriculture, Family Sciences and Technology. Fort Valley State University Fort Valley, Ga 31030. Publication Pending.
2. S. Samuels, B. Biswas, N. Sedhain, D. Jones. 2019. A Review to Domesticate Stevia to the Southeastern US. Department of Agriculture, Family Sciences and Technology. Fort Valley State University Fort Valley, Ga 31030. American Journal of Plant Sciences. Publication Pending. (Communicated)

### PRESENTATIONS

1. Biswas, B. and J, Shomari 2019. "Inspecting Stevia Germplasm and the Production of High Quality Resources" Oral presentation, 2019 ASA-CSSA-SSSA International Annual Meeting, will held on Nov. 10-13, San Antonio, Texas.
2. Biswas, B. K. and M. McKinney 2019. Peach Biotechnology Research to Develop Reproducible Protocol for Micropropagation. Oral presentation, ASHS annual meeting, July 21-25. Las Vegas, Nevada,
3. Biswas, B. K., S. Chirchir, N. P. Sedhain, and M. McKinney 2019. In Vitro Propagation of Peach Fruit Tree Is Not an Easy Job. Poster presentation, SIVB annual meeting, June 8-12. Tampa Florida,
4. Biswas, B., 2019. "No Food, No Life"-Hence Food Security Should Be Our Top Priority". Oral presentation, ARD

meeting, March 31-April 3, Jacksonville, Florida.

5. Biswas, B.; Samuels. S. and D. Jones 2019. Investigating Stevia as an Alternative Crop for Farmers. Workshop at FVSU July 18, 2019.
6. Chaney, A., S. Samuels, D. Jones, G. Lester, C. Hicks, and B. Biswas. 2019. Investigating the Effect of Ginger [*Zingiber officinale*] Extract on Neuroblastoma SH-SY5Y Cell Line After Long-Time Exposure to Morphine. 77th PAWC Conference, Tuskegee University, December 8-10. 2019.
7. Clarence Hicks, Steven Samuels, Alana Chaney, Geoffrey Lester, D'amber Jones, Bipul Biswas. 2019. Cost Analysis and Nutrient Profile Assessment of Specialty Crops Grown In Vermicompost Vis-A-Vis Hydroponics. 77th PAWC Conference, Tuskegee University, December 8-10. 2019.
8. Geoffrey Lester, Steven Samuels, Alana Chaney, Clarence Hicks, D'amber Jones, Bipul Biswas. 2019. Increasing Yield of Stevia Rebaudiana Extract through Solvent-Free Sonication In Comparison To Traditional Extraction Methods. 77th PAWC Conference, Tuskegee University, December 8-10. 2019.
9. Jones, D., Samuels, S., Alana Chaney, Clarence Hicks, Geoffrey Lester and B. Biswas. 2019. Comparison of Stevia Growth and Crop Quality in Traditional vs Hydroponics Farming. 77th PAWC Conference, Tuskegee University, December 8-10. 2019. (Award Winning Presentation)
10. Jones, D. and B. Biswas 2019. "Expanding Awareness and Self-

Sufficiency Using Hydroponic Techniques". Oral presentation, ARD meeting, March 31-April 3, Jacksonville, Florida.

11. Jones, D., Samuels, S. and B. Biswas 2019. 'Investigating Mentha (Pudina) Production in Hydroponic Systems'. Oral presentation, Ninth Annual Research Day, April 18, Pettigrew Building, FVSU, Fort Valley.
12. Ravola M. D., and B. Biswas\* 2019. "Role of Interdisciplinary Collaborations in Building Healthy Sustainable Communities" \*Fort Valley State University, & 1Alcorn State University, Oral presentation (combined), ARD meeting, March 31-April 3, Jacksonville, Florida.
13. S. Samuels, N. Sedhain, D. Jones and B. Biswas 2019. "Domestication of Stevia - an Alternative Sweetener for Production in the Southeastern U.S.A." Oral presentation, ARD meeting, March 31-April 3, Jacksonville, Florida.
14. Samuels, S., Jones, D., Chaney, A., Hicks, C., Lester, G. and B. Biswas. 2019. Domestication of Stevia - an Alternative Sweetener for Production in the Southeastern U.S.A. 77th PAWC Conference, Tuskegee University, December 8-10. 2019.

## Sarwan Dhir, PhD

### PUBLICATIONS

1. Sangra A, Shahin L, Dhir SK (2019) Optimization of conditions in alfalfa for the protoplast isolation and culture, American Journal of Plant Science, 2019 (10): 1206-1219.
2. Sangra A, Shahin L, Dhir SK (2019) Long-Term maintainable somatic

embryogenesis system in Alfalfa (*Medicago sativa*) using leaf explants: Embryogenic sustainability approach, *Plants*, 2019 (8): 1-16.

## Nirmal Joshee, PhD

### BOOK EDITING

1. *Medicinal Plants: Farm to Pharmacy*. Springer. 2019. N. Joshee, S. Dhekney, and P. Parajuli (Editors). ISBN 978-3-030-31268-8  
Over 10,000 chapter downloads in one year.

### LIST OF PUBLISHED BOOK CHAPTERS / PROCEEDINGS

1. Bajaj, R, Irvin, Vaidya, BN, Shahin, L, and Joshee, N. 2020. Optimization of micropropagation and genetic transformation protocols for *Paulownia elongata*: A short rotation fast growing bioenergy tree. *Methods in Molecular Biology 'Biofuels and Biodiesel'* (ed. C. Basu). Springer. (Accepted).
2. L Irvin, C Jackson, Aisha L. Hill, R Bajaj, C Mahmoudi, Brajesh N. Vaidya, and N Joshee. 2019. Skullcaps (*Scutellaria* spp.): Ethnobotany and current research. Ch. 7. In: *Medicinal Plants: From Farm to Pharmacy*. N. Joshee, S. A. Dhekney, P. Parajuli (Editors). Springer. Pp. 141-168.
3. Robert E. Wright III, Nirmal Joshee, and Prahlad Parajuli. 2019. Modulation of Tumor Immunity by Medicinal Plant or Functional Food-Derived Compounds. Ch. 12. In: *Medicinal Plants: From Farm to Pharmacy*. N. Joshee, S. A. Dhekney, P. Parajuli (Editors). Springer. Pp. 275-290.

### PEER-REVIEWED PAPERS

1. Wang Yi, Faiqa Nadeem, Guangyin Xu, Quanguo Zhang, N. Joshee, N. Tahir. 2020. Modifying crystallinity, and thermo-optical characteristics of *Paulownia* biomass through ultrafine grinding and evaluation of biohydrogen production potential. *Journal of Cleaner Production*, 269:1-9. <https://doi.org/10.1016/j.jclepro.2020.122386>

2. Shahin, L, SS. Phaal, Brajesh N Vaidya, Jame E. Brown, N Joshee. 2019. Aronia (Chokeberry): an underutilized, highly nutraceutical plant. *J Medicinally Active Plants* 8(4):46-63.
3. Yi W, N Joshee, W Cao, Q Wu, and N Tahir. 2019. Continuous hydrogen production by dark and photo co-fermentation using a tubular multi-cycle bio-reactor with *Paulownia* biomass. *Cellulose*. 1-10. <https://doi.org/10.1007/s10570-019-02468-z>. (0123456789(),)0123456789(),-)
4. Liu Bing, Yun-Hong Tan, Liu Su, Olmstead Richard, Min Dao-Zhang, Chen Zhi-Duan, Joshee N, Vaidya Brajesh, Chung Richard, Li Bo. 2019. Phylogenetic relationships of *Cyrtandromoea* and *Wightia* revisited: a new tribe in Phrymaceae and a new family in Lamiales. *J. of Systematics and Evolution*, 58(1):1-17, May 2019 <https://doi.org/10.1111/jse.12513>.
5. Vaidya, B.N., B. Asanakunov, L. Shahin, H.L. Jernigan, N. Joshee and S.A. Dhekney. 2019. Improving micropropagation of *Mentha x piperita* L. using a liquid culture system. *In Vitro Cell & Dev Biology – Plant*. 55(1):71–80. <https://doi.org/10.1007/s11627-018-09952-4>

## Govind Kannan, PhD

### PUBLICATIONS

1. G. Kannan, R. Gosukonda, and A. K. Mahapatra, 2020. Prediction of stress responses in goats: comparison of artificial neural network and multiple regression models. *Canadian Journal of Animal Science* 100:102-110.
2. Mechineni, D. S. Kommuru, T. H. Terrill, B. Kouakou, J. H. Lee, S. Gujja, J.M. Burke, and G. Kannan, 2020. Forage Type and Transportation Stress Effects on Gut Microbial Counts and Meat Quality in Goats. *Canadian Journal of Animal Science* dx.doi.org/10.1139/cjas-2019-0145.

3. M. T., Bryant, H. L. Degala, A. K. Mahapatra, R. M. Gosukonda, and G. Kannan, 2020. Inactivation of *Escherichia coli* K12 by pulsed UV light on goat meat and beef: microbial responses and modelling. *International Journal of Food Science and Technology* doi:10.1111/ijfs.14733.
4. G. Kannan, J. H. Lee, B. Bouakou, and T. H. Terrill, 2019. Reduction of microbial contamination of goat meat using dietary brown seaweed (*Ascophyllum nodosum*) supplementation and chlorinated wash. *Canadian Journal of Animal Science* 99:570-577.
5. H. L. Degala, J. R. Scott, Espinoza, F.I.R., A. K. Mahapatra, and G. Kannan, 2019. Synergistic effect of ozonated and electrolyzed water on the inactivation kinetics of *Escherichia coli* on goat meat. *Journal of Food Safety* 40:ei2740.

### BOOK CHAPTER

1. G. Kannan, T. H. Terrill, B. Kouakou, and J. H. Lee, 2019. Dietary brown seaweed extract supplementation in small ruminants. In: *Medicinal Plants: Farm to Pharmacy*, N. Joshee, S. Dhekney, and P. Parajuli (Editors), Springer Publishing Company, New York, NY, pp 291-312.

### ABSTRACTS AND PRESENTATIONS

1. A. Naldurtiker, P. Batchu, Z.M. Estrada-Reyes, B. Kouakou, T.H. Terrill, G. Kannan, 2020. Duration of preslaughter stress in winter on physiological responses and meat quality in goats. *American Society of Animal Science Annual Meetings, Virtual*, July 19-23, 2020.
2. G. Kannan, P. Batchu, B. Kouakou, T.H. Terrill, and Z.M. Estrada-Reyes, 2020. Behavior of goats subjected to different social isolation treatments. *American Society of Animal Science Annual Meetings, Virtual*, July 19-23, 2020.
3. G. Kannan, 2019. Brown seaweed extract supplementation in goats. *Abstracts of the American Society for Medicinally Active Plants Conference, Dehradun, India*.

# PUBLISHED WORKS

4. P. Batchu, T.M. Hazard, T. H. Terrill, B. Kouakou, J. H. Lee, and G. Kannan, 2019. Diet and preslaughter stress effects on gut microbial populations and meat quality characteristics in goats. American Society of Animal Science Annual Meetings, Austin, Texas, July 8– 11, 2019.
5. P. Batchu, T.M. Hazard, T. H. Terrill, B. Kouakou, J. H. Lee, and G. Kannan, 2019. Effects of diet and stress on gut microbial counts and meat quality in goats. Abstracts of the Asian Regional Conference on Goats. Chitwan, Nepal, October 20-23, 2019.

## Jung Lee, PhD

### BOOK CHAPTER

1. G. Kannan\*, T.H. Terrill, B. Kouakou, and J.H. Lee. 2019. Dietary brown seaweed extract supplementation in small ruminants. In: Medicinal Plants, N. Joshee, S.A. Dhekney, and P. Parajuli (Eds.), Springer, Cham.

### PROFESSIONAL REFERRED JOURNALS

1. J.H. Lee\*. 2020. Changes in flavor compounds and quality parameters of goat cream butter during extended refrigerated storage. *Int. J. Food Properties* 23:306-318.
2. B.R. Min\*, K. McTear, H.H. Wang, M. Joakin, N. Gurung, F. Abrahamsen, S. Solaiman, J. S. Eun, J.H. Lee, L.A. Dietz, W. E. Zeller. 2020. Influence of elevated protein and tannin-rich peanut skin supplementation on growth performance, blood metabolites, carcass trait and immune-related gene expression of grazing meat goats. *J. Anim. Physiol. & Anim. Nutr.* 104:88-100.
3. A. Mechineni, D.S. Kommuru, T.H. Terrill, B. Kouakou, J.H. Lee, S. Gujja, and G. Kannan\*. 2020. Forage type and transportation stress effects on gut microbial counts and meat quality in goats. *Can. J. Anim. Sci.* <https://doi.org/10.1139/CJAS-2019-0145>.

4. D. Reynolds, B.R. Min\*, N. Gurung, W. McElhenney, J.H. Lee, S. Solaiman, and O. Bolden-Tiller. 2020. Influence of tannin-rich pine bark supplementation in the grain mixes for meat goats: growth performance, blood metabolites, and carcass characteristics. *Anim. Nutr. J.* 6:85-91.
5. B.R. Min\*, F. Abrahamsen, N. Gurung, J.H. Lee, J.W. Joo, and W. Pacheco. 2019. Peanut skin in diet alters average daily gain, ruminal and blood metabolites, and carcass traits associated with *Haemonchus contortus* infection. *Anim. Nutr. J.* 5:278-285.
6. G. Kannan\*, J.H. Lee, B. Kouakou, and T.H. Terrill. 2019. Reduction of microbial contamination in meat goats using dietary brown seaweed (*Ascophyllum nodosum*) supplementation and chloride wash. *Can. J. Anim. Sci.* 99:570-577.

## Xuanli Liu, PhD

### PUBLICATIONS

1. Liu, X., N. Mack, N. Pattanaik, and M. Ibrahim. 2019. The Choice to Go Organic: Evidence from Georgia Small Farms, *Journal of Agricultural Science*, 10(12): 1-9

## Ajit Mahapatra, PhD

### PEER-REVIEWED PUBLICATIONS

1. Bryant, M\*. T., H. L. Degala\*, A. K. Mahapatra, R. M. Gosukonda, and G. Kannan. 2020. Inactivation of *Escherichia coli* K12 by pulsed UV light on goat meat and beef: microbial responses and modelling. *International Journal of Food Science and Technology*. doi:10.1111/ijfs.14733.
2. Degala, H. L.\*, J. R. Scott\*, F. I. Rico Espinoza\*\*, A. K. Mahapatra, and G. Kannan. 2020. Synergistic effect of ozonated and electrolyzed water on the inactivation kinetics of *Escherichia coli* on goat meat. *Journal of Food Safety* 40 (1): 1-7.

3. Kannan, G., R. Gosukonda, and A. K. Mahapatra. 2020. Prediction of stress responses in goats: comparison of artificial neural network and multiple regression models. *Canadian Journal of Animal Science* 100 (1): 102–110.
4. Mahapatra, A. K., D. E. Ekefre\*, H. L. Degala\*, S. M. Punnuri, and T. H. Terrill. 2019. Moisture-dependent physical and thermal properties of sericea lespedeza seeds. *Applied Engineering in Agriculture* 35 (3): 389-397.
5. Singh, A.\*, V. Owen\*, G. Dykes\*, H. Naumann\*, A. K. Mahapatra, T. H. Terrill. 2019. Effect of ensiling on nutritional properties of *Sericea Lespedeza* alone or in mixtures with alfalfa. *Journal of Agricultural Science and Technology A* 9: 310-322.

### CONFERENCE PROCEEDINGS

1. Taylor, M. E.\*, H. L. Degala\*, and A. K. Mahapatra. 2020. Hurdle Technology to Enhance Pulsed UV-light Inactivation of *E. coli* K12 on Meat. Proceedings of the Institute of Food Technologists (IFT) Meeting & Food Expo, July 13–15, 2020, Chicago, IL.
2. Arya, R.\*, M. Bryant\*, H. L. Degala\*, A. K. Mahapatra, and G. Kannan. 2019. Enhancing the Safety of Goat Meat by Pulsed Ultraviolet Light against *E. coli* K12. Proceedings of the Institute of Food Technologists (IFT) Meeting & Food Expo, June 2-5, 2019, New Orleans, LA.
3. Arya, R.\*, H. L. Degala\*, A. K. Mahapatra, and G. Kannan. 2019. Enhancing the Safety of Goat Meat by Sonication against *Escherichia coli*. Proceedings of the American Society of Agricultural and Biological Engineers (ASABE) Annual International Meeting, July 07–10, 2019, Boston, MA.
4. Mahapatra, A. K., R. Arya\*, M. Bryant\*, H. L. Degala\*, and G. Kannan. 2019. Pulsed Ultraviolet Light Inactivation of *E. coli* on Goat Meat. Proceedings of the Promoting Participation of HBCUs/

# 2019 – 2020

MSIs in Advanced Manufacturing R&D Workshop, November 6-8, 2019, NSF Headquarters, Alexandria, VA.

5. Shaw, K. J.\*\*., H. L. Degala, A. K. Mahapatra. 2019. Inactivation of E. coli K12 Using Ultraviolet Light on Chicken Breast. Proceedings of the Annual Biomedical Research Conference for Minority Students (ABRCMS), November 13-16, 2019, Anaheim, CA.
6. Bryant, M.\*., H. L. Degala\*, A. K. Mahapatra, and G. Kannan. 2019. Efficacy of Pulsed UV-light in Inactivating Escherichia coli on Meat Surfaces. Proceedings of the 19th ARD Biennial Research Symposium, March 30–April 03, 2019, Jacksonville, FL.
7. Taylor, M.\*., H. L. Degala\*, A. K. Mahapatra, and G. Kannan. 2019. Synergistic Antimicrobial Efficacy of Pulsed UV-light and Lemongrass Oil in Inactivating Escherichia coli on Meat Surfaces. Proceedings of the 19th ARD Research Symposium, March 30–April 03, 2019, Jacksonville, FL.
8. Shahin, L\*., A. K. Mahapatra, and N. Joshee. 2019. Effect of Various Drying Methods on Drying Characteristics and Antioxidant Properties of Paulownia Elongata Laves. Proceedings of the International Goat Association Asian Regional Conference on Goats (IGA-ARCG 2019), October 20-23, Chitwan, Nepal.

## George McCommon, DVM

### PUBLICATIONS

1. June 2020: Journal of Regenerative Medicine and Biology, Young, H.E., Limnios, I.J., Lochner, F., McCommon, G., Tolemerase-Positive Stem Cells in Adult Porcine and Adult Rat Spleens I Totipotent Stem Cells Volume 1; Issue 2 (2020) JRMBR-1 (2):1-20
2. 2020 3 book chapters: McCurnin's Textbook of Veterinary Technology, 10th Edition: Ch. 7: History and Physical Examination, Ch. 8: Preventative Health Programs and Ch. 32: surgical

Instruments and Aseptic Technique. Accepted to be in book due to be published Spring/ Summer 2021

## Cedric Ogden, PhD

### PUBLICATIONS

1. Ogden, C. A., K. E. Ileleji, 2020. Physical Characteristics of Ground Switchgrass Related to Bulk Solids Flow. Powder Technology (Accepted but Under review for modifications)
2. Ogden, C. A., K. E. Ileleji, K. D. Johnson, 2019. Fuel property changes of switchgrass during one-year of outdoor storage Biomass and Bioenergy. Biomass and Bioenergy 120: 359-366.

## Young W. Park, PhD

### BOOK CHAPTERS

1. Guler, Z. and Y.W. Park, 2020. Cholesterol. Chapter 11. In: Handbook of Dairy
2. Foods Analysis. L. Nollet and F. Toldra, Eds., CRC Press. Boca Raton, FL. Second Edition.

### PUBLICATIONS

1. Paswan, R. and Y.W. Park. 2020. Survivability of Salmonella and Escherichia coli O157:H7 pathogens and food safety concerns on commercial powder milk products. Dairy 1(3):189-201. MDPI. doi.org/10.3390/dairy1030014
2. Renchinkhand, G., S-H, Cho, Y. W. Park, G-Y, Song, and M. S. Nam. 2020. Biotransformation of major Ginsenoside Rb1 to Rd by Dekkera anomala YAE-1 from Mongolian fermented milk (Airag). J. Microbiol. Biotechnol. 30(10): 1536-1542. https://doi.org/10.4014/jmb.2004.04022
3. Haenlein, G.F.W. and Y.W. Park. 2020. Fighting the Deadly Helminthiasis without Drug Resistance. Dairy 1(3): 177-186. MDPI. doi.org/10.3390/dairy1030012
4. Park, Y.W. 2020. The impact of plant-based non-dairy alternative milk on the

dairy Industry. Food Sci Anim Resour. pISSN: 2636-0772: doi.org/10.5851/kosfa.2020.e82

5. Siddique, A. and Y. W. Park, 2019. Effect of iron fortification on microstructural, textural and sensory characteristics of caprine milk Cheddar cheeses under different storage treatments. J. Dairy Sci. Vol. 102:2890-2902. https://doi.org/10.3168/jds.2018-15427
6. Nam, M.S., J.H. Nam, H.C. Bae, G. Renchinkhand, Y.W. Park, 2019. Physicochemical properties of rice powder added camembert cheese during 4 weeks ripening. Adv Dairy Res. 7:229. doi: 10.35248/2329-888X.19.7.229.
7. Galina, M.Á., J. Pineda, R. Isabel, H. Piedrahita, P. Vázquez, G. Haenlein, J. Olmos and Y. W. Park. 2019. Effect of Grazing on the Fatty Acid Composition of Goat's Milk or Cheese. Adv Dairy Res. 7:227 doi: 10.35248/2329-888X.19.7.227
8. Park, Y.W., J. O. Oglesby, S.A. Hayek, S.O. Aljaloud, R. Gyawali and S.A. Ibrahim. 2019. Impact of different gums on textural and microbial properties of goat milk yogurts during refrigerated storage. Foods. 8:169; doi:10.3390/foods8050169.
9. Park, Y.W. and A. Siddique. 2019. Effects of iron fortification on fatty acid profiles of caprine milk Cheddar cheeses under different storage treatment regimens. Adv. Dairy Res 7:2. doi: 10.2045/2329-888X.1000225.
10. Siddique, A. and Y. W. Park, 2019. Evaluation of correlation between acid degree value and peroxide value in lipolysis of control and iron fortified caprine milk cheeses during 4 months storage. Open J. Animal. Sci. 9:1-11. DOI: 10.4236/ojas.2019.91001

### PRESENTATIONS

1. Paswan, R., A. Mishra, and Y. W. Park., 2020. Survivability of Salmonella pathogens in powder goat milk stored under refrigeration and room

# PUBLISHED WORKS

- temperatures for 6 months. *J. Dairy Sci.* 103 (Supplement 1), pp-272.
2. Paswan, R., A. Siddique, A. Mishra, and Y. W. Park., 2020. Profiles of fatty acid composition in relation to water activity of powder goat milk stored under different storage time and temperature. *J. Dairy Sci.* 103 (Supplement 1), pp-221.
  3. Park, Y.W. 2019. The Asian New Frontiers of Dairy Goat Products. International Goat Association: Asian Regional Conference on Goats. Abstrct. #14. Chitwan, Nepal. Oct. 20-23, 2019.
  4. Park, Y.W. and A. Siddique. 2019. Effect of iron fortification on rheological and sensory characteristics of caprine milk Cheddar cheese. IGA Asian Regional Conference on Goats. Abstrct. #116. Chitwan, Nepal. Oct. 20-23.
  5. Siddique, A. and Y.W. Park. 2019. Unique characteristics of lauric to capric fatty acid ratios in control and iron fortified caprine milk Cheddar cheeses under different storage treatment regimens. Abstract No. EP-004. New Orleans, LA.
  6. Paswan, R., A. Siddique and Y.W. Park. 2019. Comparison of different types of acidity values of three phases of caprine cheese milk during Cheddar cheese manufacture. *J. Dairy Sci.* Vol. 102. Suppl. 1. Abstract #M70. Page 33.
  7. Siddique, A. and Y.W. Park. 2019. Fatty acid profiles of control and iron fortified caprine milk Cheddar cheeses stored under different time and temperature. *J. Dairy Sci.* Vol. 102. Suppl. 1. Abstract #M71. Page 33.
  8. Nam, J.H., H.C. Bae, Y.W. Park and M.S. Nam. 2019. Physicochemical, textural and sensory characteristics of control and rice powder added Camembert cheeses during 4 weeks aging. *J. Dairy Sci.* Vol. 102. Suppl. 1. Abstract #M72. Page 33.

## Somashekhar M Punnuri, PhD

### PEER-REVIEWED ARTICLES

1. Harris-Shultz, K., Knoll JE, Punnuri S, Niland E, Ni X. (2020). Evaluation of Strains of *Beauveria bassiana* and *Isaria fumosorosea* to Control Sugarcane Aphids [*Melanaphis sacchari* (Hemiptera: Aphididae)] on Grain Sorghum. *Agrosystems, Geosciences & Environment.* 2020; 3:e20047. <https://doi.org/10.1002/agg2.20047>
2. Harris-Shultz, K., Punnuri S, Knoll JE, Ni X, Wang H. (2019). The sorghum epicuticular wax locus *Bloomless2* reduces plant damage in P898012 caused by the sugarcane aphid. *Agrosystems, Geosciences & Environment.* 2020;3:e20008 <https://access.onlinelibrary.wiley.com/doi/abs/10.1002/agg2.20008>
3. Lahiri S, Ni X, Buntin GD, Punnuri S, Jacobson A, Reay-Jones PPF, Toews MD. (2019). Combining host plant resistance and foliar insecticide application to manage *Melanaphis sacchari* (Hemiptera: Aphididae) in grain sorghum. *International Journal of Pest Management.* (Published online: 31 Oct 2019) DOI:10.1080/09670874.2019.1660830
4. Mahapatra AK, Ekefre DE, Degala H, Punnuri S M, Terrill TH. (2019). Moisture-dependent physical and thermal properties of sericea lespedeza seeds. *American Society of Agricultural and Biological Engineers. Applied engineering in agriculture* 2019 v.35 no.3 pp. 389-397

### PRESENTATIONS

1. Invited lead speaker at the UHS Bagalkote Department of Biotechnology and Crop Improvement, College of Horticulture, GKVK, Bengaluru, a constituent college of the University of Horticultural Science, Bagalkot, International E-conference on “Advances and Future Outlook in Biotechnology and Crop improvement for

Sustainable Productivity” from 24th to 27th November 2020

2. Invited speaker at the Southeast Regional Fruit and Vegetable Conference SERFVC on-going research and educational efforts on “Managing Whiteflies and Whitefly transmitted viruses in Vegetable Crops in the Southeastern US” Jan 10, 2020
3. Selected as 2019 SEED (The Scientists Engaging and Educating Decision-makers) Ambassador for Tri-Society’s immersive advocacy training program with the goal of developing trusted relationships between Society members and Members of Congress.
4. Invited by Tri-Societies Government relations office to present research work to the members of congress and 2019 Annual Ag Research Exhibition at Capitol Hill Washington D.C.-May, 2019
5. ARD Research Symposium-2019- Oral presentation- Enabling a High-Throughput Genotyping and Phenotyping Capacity for Understanding the Sugarcane Aphid Resistance in Sorghum at FVSU through a capacity building grant. Jacksonville, FL-March 29 - April 3, 2019

## Mahipal Singh, PhD

### PEER-REVIEWED FULL RESEARCH PAPERS

1. Mahipal Singh, Ben Hortman, Venkata N. Degala and Xiaoling Ma. Establishment and Characterization of a Lactating Caprine Mammary Gland Luminal Epithelial Cell Line. *International Journal of Biology.* (2019) 11(3): 35-41. (DOI:10.5539/ijb.v11n4p36)

### ABSTRACTS (PEER-REVIEWED) PUBLISHED IN CONFERENCES/ SOCIETY MEETINGS

1. Singh, M, W. Spratling, S. A. Aoued, O. J. Ojo, A.I. Younis, and E. Amoah. Oocyte recovery from slaughterhouse collected ovaries in goat, sheep and swine and their quality assessment. Presented

- in the 53rd annual meeting of the Society for the Study of Reproduction, July 8-12, 2020, Ottawa, Ontario, Canada. Abstract No: 1619, page 229.
2. Singh, M; Ben Hortman, Venkata N. Degala and Xiaoling Ma. Establishment and Preliminary Characterization of a Lactating Caprine Mammary Gland Luminal Epithelial Cell Line. *In Vitro Cell. Dev. Biol.-Animal* (2019) 55: 567 (<https://doi.org/10.1007/s11626-019-00379-8>).
  3. K. Weekes, T. Williams, X. Ma, and M. Singh. (2019). Transfection of Fibroblast cells by plasmid DNA using 4D Nucleofection. FVSU 9th Annual Research Day, April 18, 2019. Abstract on page 12.
  4. Singh, M; Ki-Eun Park, William Tyler, George McCommon, Telugu Bhanu, Miranda Knight, Ann Gillespie, Xiaoling Ma, Ann Powel, David Donovan, Timothy Ramsay, PSXIII-40 Superovulation and oocyte recovery rates in CIDR synchronized goats treated with PGF2 $\alpha$ , FSH and GnRH during breeding season, *Journal of Animal Science*, Volume 97, Issue Supplement 3, December 2019, Page 367, (<https://doi.org/10.1093/jas/skz258.732>).
  5. #,\*K. Weekes\*, T. Williams, X. Ma, and M. Singh. (2019). Efficient Transfection of Goat Primary Fibroblasts by plasmid DNA using 4D Nucleofection System. Presented by undergraduate student at National Council of Undergraduate Research (NCUR) Conference at the Kennesaw State University, April 10-13, 2019. ([https://apps.cur.org/ncur2019/search/Display\\_NCUR.aspx?id=114214](https://apps.cur.org/ncur2019/search/Display_NCUR.aspx?id=114214))
  6. #,\*K. Weeks, T. Williams\*, X. Ma, and M. Singh. Optimization of Plasmid DNA Concentration for Efficient Transfection of Goat Primary Fibroblasts using Nucleofection. Presented in 19th Biennial ARD Research symposium, Jacksonville, FL, March 30, 2019.
  7. #,\*A. Kutagulla\*, X. Ma, and M. Singh, Recovery of Proliferative Cells from Refrigerated Visceral Organs in Livestock. Presented in 19th Biennial ARD Research symposium, Jacksonville, FL, March 30, 2019.
- ### Hari Singh, PhD
- #### PEER-REVIEWED JOURNAL ARTICLES, PUBLICATIONS IN CONFERENCE/SYMPOSIUM PROCEEDINGS, AND/OR PRESENTATIONS IN CONFERENCES/SCIENTIFIC MEETINGS
1. Singh, H.P., V.N. Degala, Q. Woodford, and Z.R. Chambers (2020). Cellulose Nanocrystals from Cellulosic Biomass Waste: Unique Green Material for Product Development across Industries with Income Generating Potential. Annual Meeting of American Society of Agronomy, Southern Regional Branch, Feb 1-3, 2020, Louisville, KY.
  2. Manouchehrinejad, M., K. Sahoo, N. Kaliyan, H.P. Singh, and S. Mani (2020). Economic and environmental impact assessments of a stand-alone napier grass-fired combined heat and power generation system in the southeastern US. *The International Journal of Life Cycle Assessment*, 25: 89–104.
  3. Singh, H.P., Q. Woodford, and V.N. Degala (2019). Preparation of hydrogels from energy cane bagasse cellulose fibers. International Conference on Nanoscience, Nanotechnology & Advanced Materials (IC2NAM), Chicago, 22-23 June 2019.
  4. Singh, H.P., Q. Ma and J.Y. Zhu (2019). Production of Nanomaterials from Napier grass Biomass using a Recyclable Acid Hydrotrope. ARD Research Symposium 2019 “Making Critical Contributions to Rural Prosperity and Challenges in Food and Agriculture”, March 30- April 3, 2019, Hyatt Regency Jacksonville, FL.
  5. Singh, H.P., Q.L. Woodford, and V.N. Degala (2019). Preparation of Hydrogels from Energy Cane Bagasse Cellulose Fibers. *International Journal of Advances in Science, Engineering and Technology (IJASEAT)* Vol 7(3): 15-17.
  6. Chiluwal, A., H.P. Singh, K. Sahoo, R. Paudel, W.F. Whitehead, and B.P. Singh (2019). Napiergrass has dual use biofuel feedstock and animal fodder. *Agronomy Journal*, <https://doi:10.2134/agronj2018.09.0601>
  7. Degala, V.N. and H.P. Singh (2019). Optimization of Dialysis, Homogenization and Sonication Processes to Obtain Enhanced Yield of Cellulose Nanocrystals from Bioenergy Crops. ARD Research Symposium 2019 “Making Critical Contributions to Rural Prosperity and Challenges in Food and Agriculture”, March 30- April 3, 2019, Hyatt Regency Jacksonville, FL.
  8. Woodford, Q., V.N. Degala, and H.P. Singh (2019). Preparation, Properties and Applications of Superabsorbent Hydrogels (SAP) from Cellulose Nanocrystals. ARD Research Symposium 2019 “Making Critical Contributions to Rural Prosperity and Challenges in Food and Agriculture”, March 30- April 3, 2019, Hyatt Regency Jacksonville, FL.
  9. Chambers, Z, V.N. Degala, and H.P. Singh (2019). Hydrophobic Nanofibril Aerogels as Reusable and Recyclable Oil Absorbents. ARD Research Symposium 2019 “Making Critical Contributions to Rural Prosperity and Challenges in Food and Agriculture”, March 30- April 3, 2019, Hyatt Regency Jacksonville, FL.
  10. Singh, A. and H.P. Singh, T. Terrill and O. Samples (2019). Screening of Soybean Germplasm Lines for Salt Tolerance under Varying Levels of Soil Salinity. ARD Research Symposium 2019 “Making Critical Contributions to Rural Prosperity and Challenges in Food and Agriculture”, March 30- April 3, 2019, Hyatt Regency Jacksonville, FL.

## FVSU receives \$2.25M dollar grant to enhance student success in science programs



The National Science Foundation (NSF) recently awarded a five-year \$2.25 million grant to Fort Valley State University to maintain its support of research capabilities, STEM (science, technology, engineering and mathematics) education and emerging technology.

The 1890 Land-Grant University seeks to build on the successes of two former projects funded by the NSF's Historically Black Colleges and Universities – Undergraduate Program (HBCU-UP). The proposed project will provide a unique opportunity for undergraduates and dual-enrollment students at FVSU to gain multidisciplinary research skills in genome engineering and computational data science.

Dr. Sarwan Dhir, FVSU plant biotechnology professor, said the goal of the HBCU-UP is to recruit and retain 80 undergraduates over five years and provide mentoring, academic support and knowledge in advanced graduate research. Specific emphasis is on increasing the number of well-prepared FVSU students who seek to obtain a STEM-related doctoral degree and who can successfully be accepted into the nation's top STEM graduate programs or the workforce.

Additionally, Dhir said the multimillion-dollar grant will provide research stipends for participating students and travel funds. Students can present their research at national and international professional scientific meetings and conferences. This includes six-week international summer internships for 40 students during the grant period.

Furthermore, eligible students must fully participate in the program enrichment activities such as guest speaker seminars, workshops, events at the campus level and community outreach. Recipients also must participate in internships that reflect their academic goals.

Dhir is collaborating with several FVSU colleagues and more than 30 national and international research institutions on this project. A team of FVSU STEM research faculty have already planned 20 activities. As principal investigator, Dhir said Dr. T. Ramon Stuart, FVSU provost and vice president of academic affairs, will serve as the project's co-principal investigator for overall supervision.

FVSU computer science professors Masoud Naghedolfeizi (part of two previous NSF HBCU-UP projects) and Xiangyan Zeng will also serve as co-principal investigators.

Dr. Ralph Noble, dean of the College of Agriculture, Family Sciences and Technology, said the CAFST is proud to support Dhir and his team in developing this cutting-edge program at FVSU.

"Every day, the research community and society are inundated with information that is generated at a mind-blowing rate. There is a growing need for individuals familiar with how to manage this information or data," Noble said. "That is where bioinformatics and computer science training play a role. With minorities (especially African Americans) needing a boost in training in STEM fields, this project will provide our students with training that blends expertise from both areas with exponential experience from across the country and around the world. We look forward to the arrival of the first cohorts and the career path they will develop."

## FVSU graduates honored as U.S. Department of Agriculture 1890 National Scholars



Jaylan Horton and Asha Fears received recognition from the U.S. Secretary of Agriculture Sonny Perdue and Congressman Sanford Bishop through a virtual spring 2020 ceremony. Horton and Fears were among more than 20 graduating 1890 National Scholars.

The USDA 1890 National Scholars Program was established in 1992 as part of the partnership between the USDA and the 19 1890 Land-Grant Universities. The program provides full tuition, fees, books, room and board to students pursuing degrees in agriculture, food, natural resource sciences or related academic disciplines.

Appreciative of the recognition, Horton, who earned a bachelor's degree in biology, said without the USDA 1890 Scholarship, he would have taken out additional loans and found a job to help pay for school. "It lifted a huge burden off my shoulders and my family's shoulders. All I had to do was attend school and do my work," he said. Horton said his goal is to attend veterinary school. He plans to return to his alma mater in fall 2020 to pursue his master's degree in animal science.

Fears, who earned a bachelor's degree in veterinary technology, learned about the USDA 1890 Scholarship while attending Montgomery College in Maryland. After graduating with her associate degree in general studies in 2017, she decided to attend FVSU because it offers the only four-year veterinary technology program in Georgia.

The Washington, D.C., native said the scholarship was a blessing. "It not only helped me financially, but the internship opportunity was rewarding because they send you to a site that is related to your major," she said.

She and Horton encourage students to apply for the USDA 1890 Scholarship. "If you don't get it the first time, don't give up. Keep trying," Horton advised. He also recommends for students to find mentors. His support system included family, friends, Hollis, FVSU Outreach and Marketing Coordinator Fanisha Maze, Dr. Vernard Hodges of Critter Fixer Veterinary Hospital and his professors.

"If you are interested in agriculture or working for the government, the 1890 scholarship is the way to go," Fears urged.

## Satisfying a sweet tooth with healthy alternatives



A Fort Valley State University professor is the first African American to own an alternative sweetener in the United States.

Baking for more than 30 years, Dr. Hamidah Sharif-Harris, assistant professor of public health at FVSU, said about two years ago, she eliminated sugar from her diet. Within six months, she dropped 65 pounds.

“I was immediately able to see the benefits. I do not have prediabetes or high blood pressure. I was 42 feeling 52. Now I am 44 and I feel 24,” she beamed.

The secret is her natural alternative sweetener, Momma’s Shuga, that contains erythritol and monk fruit extract, which do not affect blood sugar levels or cause any harmful side effects. Sharif-Harris said the body metabolizes the sweetener as fiber.

Her business and health success began with a desire to transform her community by providing more access to affordable and nutritious food. After visiting Fort Valley, Georgia, with her family six years ago, they established a sweet potato and seasonable vegetable farm. Commuting from Atlanta, Georgia, to the small town to maintain the land, they officially moved to the area in 2017. The following year, the 20-year public health professional and educator began teaching at FVSU and researching food sovereignty – a community’s ability to produce and control its own food sources.

“We are a community that is rich and fertile with resources; however, we do not retain any of those assets,” Sharif-Harris said.

Her goal for the last two years was to create a Fort Valley establishment that would provide an additional avenue of healthy food options for the community. Through her research, she discovered that 10 percent of Fort Valley residents have some type of diabetes-related condition and 40 percent are obese.

For this reason, the Certified Naturally Grown farmer recently opened a bakery for the whole family to enjoy the health benefits of her sweetener. Sweet Valley Bakery and Farmstand is Fort Valley’s only bakery and Georgia’s first 100 percent sugar-free bakery. It offers handcrafted baked pastries and sweet delights that contain zero sugar and are 90 percent gluten-free.

The Georgia Grown Initiative member affectionally termed her natural sweetener Momma’s Shuga in honor of her grandmother and mother. “I wanted the name to resonate with the community. This is a way of giving themselves love,” Sharif-Harris said.

The Sweet Valley owner said sweeteners normally leave an aftertaste, but Momma’s Shuga tastes and bakes like sugar without the calories. She worked with a food scientist at a natural food manufacturing company to develop the sweetener, which is also vegan and non-GMO (genetically modified organism).

“It took about three months to get it right,” said Sharif-Harris, pleased that Momma’s Shuga is selling across the country.

In addition to providing healthy food options at the bakery, Sharif-Harris plans to use the 2-acre land as a site for local farmers to sell their crops. Other ways that she gives back is by hiring two Fort Valley natives. Kyler Palms, who graduated from FVSU in 2017 with a psychology degree, is proud to work for someone who created their own alternative sweetener. “I am here to learn and grow with her,” she said.

Sweet Valley is located at 728 Aldridge Road. Visit [sweetvalleyga.com](http://sweetvalleyga.com) for more information and store hours.

## Fort Valley State University agricultural students receive national NCIS scholarship



A \$3,000 National Crop Insurance Services (NCIS) scholarship is helping Fort Valley State University agricultural economics juniors Faith Fantroy and Charity Greene not only cover college expenses but get a step closer to achieving their career goals.

NCIS distributes these scholarships annually to students in completing their education and preparing for a career in agriculture. The scholarship money may be used for tuition, fees, books and other related expenses. Each semester, the award recipients must maintain a minimum 3.0 cumulative grade point average, have a declared major in an agricultural discipline, and continue as a full-time student in good standing at their university.

Fantroy said receiving the \$3,000 scholarship offers her not only a means to cover college expenses, but it offers her a peace of mind and motivates her more to accomplish her goals.

“I want to work to make healthy foods more economical and available to the public,” Fantroy said. “Ultimately, I want to be a business owner, but first I want to work in a major corporation within the agricultural industry and to be a philanthropist.”

Greene is also grateful to receive the NCIS scholarship. “It means a lot because not only is it helping me with college, but it is a blessing from God. This scholarship means all the hard work really paid off,” she said. “This is only the beginning.”

“Growing up, my interest gravitated more toward the process of marketing products and managing a team. As I learned the importance of how these same attributes can play a vital role in agriculture, my mindset began to change. Fort Valley State University’s agricultural economics program opened the door to a broader career path,” Greene said.

Dr. Ralph Noble, dean of FVSU’s College of Agriculture, Family Sciences and Technology, congratulates Fantroy and Greene on this accomplishment. “This recognition is evident of these two scholars’ hard work and dedication. I am proud of their achievements, as well as their future success at FVSU, and we anticipate even greater achievements in their agricultural careers,” he said.

NCIS is a 503(c) not-for-profit crop insurance trade association whose membership includes private companies offering federal multiple peril crop insurance.

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