March 2020

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It has been a very challenging month and a lot has changed on our campus and throughout the state.

First, I must thank our faculty and teaching staff for the monumental effort they have made to move our classes into an online format. They have worked diligently to ensure that our students’ learning opportunities will continue despite the novel coronavirus, which has brought much of the world to a standstill.

Their challenges are not over. Counties across Texas, including Brazos County, are issuing “shelter at home” orders to help slow the spread of the virus and prevent sick patients from overrunning our hospitals and medical staff.

We have canceled programs for the next month, and changed the way our Extension faculty interacts with the public. Most of our staff is now working remotely. Kudos to Scott Vajdak and IT personnel at our centers for making sure they had the equipment they needed to work from home.

At the same time, much has remained the same. Across the state, winter wheat and other crops are growing. Producers are preparing for spring planting, and our researchers continue to move forward with their trials, each with a unique way of addressing the social distancing requirements. Outreach efforts continue. We held our turfgrass short course and a conservation – sustainable agriculture field tour earlier in the month. These were great opportunities to share our research knowledge, but for the next month any meetings of this type which have not been canceled will be conducted via the internet.

Texas developed procedures to apply for hemp production licenses this month and we are excited to begin working with producers and industry partners on this exciting new opportunity. We will be able to initiate an application for Extension and Research activities this week. This has led to an unusually large number of conference calls this week to organize our efforts and get contracts negotiated for research and extension activities.

We appreciate the efforts of our faculty retreat leadership team to develop the outline for our new strategic plan based on the retreat. Steve Hague has served as chair of this group and is moving it forward with the rest of the team. Hopefully, it can be wrapped up while we are practicing social distancing.

We have welcomed a new Extension Specialist for small grains and oilseed crops to our faculty. Dr. Fernando Guillen-Portal joined us March 1. Learn more about him in the story on page 3.

I was able to participate in the Weed Science Society of America Annual meetings prior to the travel restrictions. Weed Science is a very hot area right now and it was great to see our faculty provide leadership for the society and their outstanding work. It was especially good to see the tremendous contribution that our graduate students make to the society. Congratulations go out to Dr. Muthu Bagavathiannan. He received the Early Career Outstanding Scientist award from the Weed Science Society of America during their annual meeting (see story on page 4). The whale watching from the hotel was fun as well.

We will continue with annual reviews, although this year they will be online. We have now completed just about ½ of the faculty reviews. The accomplishments of the unit are tremendous, from new varieties of our major crops, to new patents, to meeting the needs of producers through exceptional training programs. Our grad students continue to be sought after in the workforce and we are excited about the many leadership opportunities our faculty participate in to advance our science.

I hope everyone stays healthy and optimistic.
AgriLife Extension hires new small grains specialist

By: Kay Ledbetter

The Texas A&M AgriLife Extension Service has hired Fernando Guillen, Ph.D., as the new statewide small grains and oilseed crops specialist in the Department of Soil and Crop Sciences at Texas A&M University. He officially started March 1.

“Dr. Guillen brings a wealth of agronomic experience to AgriLife Extension’s small grains program, and we are excited to have him joining our department and extension unit,” said Larry Redmon, Ph.D., associate department head and AgriLife Extension program leader for the department.

Guillen brings experience

Coming to Texas from Bozeman, Montana, Guillen was a private consultant and a research associate at Montana State University. He earned his master’s and doctorate degrees from the University of Nebraska, Lincoln, and his bachelor’s degree from the Juan Misael Saracho Bolivian University in Bolivia. He also was a postdoctoral research scientist at the Northwestern Agricultural Research Center for Montana State University, Kalispell, Montana.

His past research relates to the development and application of new ways to better understand relative changes in cultivar productivity as a result of varying growing conditions in a target region, also known as genotype-by-environment interactions.

Also, Guillen said he includes using innovative crop management protocols to increase crop productivity in his research. Examples would be the use of integrated pest management strategies for weed control and the use of micronutrients as yield enhancers in wheat.

Guillen’s plant breeding activities include developing varieties in corn and wheat, as well as grain amaranth and camelina crops. Most recently, he led the camelina breeding program at Sustainable Oils LLC for the development of superior cultivars to be used as a feedstock for biofuel production. He also worked with their wheat tilling research program at Targeted Growth Inc., which was aimed at identifying specific, proprietary mutation-altered genes with a positive impact in yield.

Guillen’s plans for Texas position

“I believe the Texas small grains specialist position is a strong match between the position’s objectives and my professional background,” Guillen said. “Even before applying for this position, I knew the small grains breeding program at Texas A&M was doing a superb job in the development of superior cultivars in small grains, mainly wheat, for the different wheat growing regions in Texas.

“From a genetic perspective, I was glad to see that the small grains breeding program is already implementing state-of-the-art strategies like the use of gene-editing tools with the ultimate goal of yield enhancement,” he said.

Guillen said it is well recognized that increases in crop productivity arise from the use of both superior genetics and the adoption of optimum crop management protocols for commercial production.

“Thus, my interest falls into defining and using crop management protocols that allow the maximization of productivity of elite wheat cultivars developed for Texas, which in essence consists in closing the gap between the yield potential of a cultivar under optimum growing conditions and the observed yield of a cultivar at the farm level,” he said.

AgriLife Extension outreach needed

“This will require a precise measure of the observed yield gap in the target regions,” he said. “It also requires identifying the major underlying factors explaining the gap, adopting crop management protocols conducive to directly or indirectly reducing the gap, and effectively transferring the technology to the farm.”

To accomplish this, the involvement of agronomists, specialists, plant breeders, soil scientists, plant pathologists, weed scientists and economists is needed, which can be seen as a challenge, he said. “But I prefer to see it as a unique opportunity instead.”

The bottom line is it is one thing to know what is required and another to get the farmers to use it, Guillen said.

“That requires a transfer of technology, and that is where AgriLife Extension is important,” he said.

Other grains and oilseeds

Guillen said his focus will not be on wheat alone. He will work with oats, barley and other small grains as well as oilseed crops such as camelina and canola.

“I have a lot of experience in camelina and collaborated on it with Dr. Gaylon Morgan here in Texas in the past,” he said. “I will try to reintroduce it in those areas where we believe there is potential and also work with canola if the opportunity arises.”

Guillen said when he first started working with camelina in Montana, no one knew anything about the crop, “so we had to show farmers how to grow it through Extension practices. I plan to use that same Extension networking to work with all the important crops here in Texas.”
Texas A&M AgriLife researcher Bagavathiannan receives weed science society Early Career Outstanding Scientist Award

By: Kay Ledbetter

Texas A&M AgriLife researcher Muthukumar Bagavathiannan, Ph.D., was honored with the Early Career Outstanding Scientist Award by the Weed Science Society of America, WSSA, recently at the society’s annual meeting in Maui, Hawaii. WSSA is the premier weed science society in the U.S. and this is the highest recognition for an early career scientist by the society.

The early career award is presented to scientists within the first 10 years of their career past their doctorate who have demonstrated originality and creativity and who have made a notable contribution to weed science with potential for continued excellence.

“Dr. Bagavathiannan has been leading the way not only here at Texas A&M, but throughout the U.S. and worldwide to address the collective issue of weed management across agricultural and natural landscapes,” said Patrick Stover, Ph.D., vice chancellor of Texas A&M AgriLife, dean of the College of Agriculture and Life Sciences and director of Texas A&M AgriLife Research. “He is definitely an asset on our faculty and will help our agencies tackle future weed management issues. This is a well-deserved recognition.”

Bagavathiannan joined the Texas A&M University Department of Soil and Crop Sciences as a tenure-track weed science faculty member in 2014 with an AgriLife Research appointment. He has since established a rigorous research group that is gaining national and international recognition in weed science research.

“Dr. Bagavathiannan has served as a spark for our weed science program at Texas A&M,” said David Baltensperger, Ph.D., soil and crop sciences department head. “The timeliness of the expertise he brings has been exceptional. He was an author or co-author on more than 15 presentations and posters and his students were recognized for first and second outstanding poster at the recent WSSA meeting.

“Dr. Bagavathiannan has had a huge impact on our department, through training the next generation of scientists in emerging weed science issues while focusing on solutions for Texas producers.”

Bagavathiannan earned agriculture and agronomy bachelor’s and master’s degrees from the Tamil Nadu Agricultural University in Coimbatore, India, as well as a master’s in plant genetic manipulation from the University of Nottingham, Sutton Bonington, England and his doctorate in weed ecology from the University of Manitoba, Winnipeg, Canada.

With research interests in the broader area of weed science and agronomy, his particular emphasis is on weed ecology and management. The goal of his research program is to understand the evolutionary biology and dynamics of herbicide resistance in weed communities and develop integrated weed management solutions for effectively targeting weed seedbanks. Notably, his program utilizes digital technologies in precision weed detection, management and ecology.

Bagavathiannan has published over 65 peer-reviewed journal articles, 10 book chapters and several outreach bulletins. He has already mentored three doctorate students, three master’s students, four postdoctoral researchers, two research assistants, five visiting scholars, 12 student interns and eight undergraduate researchers. He is currently mentoring seven doctorate students, two master’s students, a visiting scholar, a student intern and two undergraduate researchers.

Bagavathiannan currently leads a multi-state National Institute of Food and Agriculture, NIFA, Specialty Crop Research Initiative-funded research project on annual bluegrass management, a Beltwide Palmer amaranth seedbank management project funded by Cotton Incorporated, a project investigating gene flow between sorghum and johnsongrass funded by NIFA-Biotechnology Risk Assessment Research Grants Program and USDA-ARS, a harvest weed seed control project as well as a weed resistance management decision-support tool development funded by the NIFA-AFRI Foundational program, a weed-resistance management decision-support tool development funded by the Crop Protection and Pest Management program, and an organic cotton project funded by the NIFA-ORG program.

He is also a co-investigator in a number of projects that are currently ongoing or recently completed at the state and national levels.

He collaborates broadly at local, regional, national and international levels on a number of research projects focusing on integrated weed management. He is an active member of the Getting Rid of Weeds, GROW, and Precision Sustainable Agriculture teams led by Steve Mirsky, Ph.D., U.S. Department of Agriculture-Agricultural Research Service, USDA-ARS.

Examples of his leadership and professional services noted include the chair of the WSSA herbicide-resistant plants committee, an associate editor for the Weed Science and Crop Science journals and a panel member/reviewer for a number of U.S. Department of Agriculture-National Institute of Food and Agriculture grants.

He will chair the New Technology session at the 2020 International Weed Science Congress to be held in Bangkok, Thailand, and is an invited speaker for several other meetings and events in 2020.
Conservation and sustainable agriculture practices aim to address our world’s need for food and fiber products with minimal impact on the soil and available water resources. Farmers who implement these practices may qualify for federal funding if certain standards are met.

The standards are set by the National Resource Conservation Service (NRCS), based on land grant university research, and disseminated to producers through the NRCS and Texas A&M AgriLife Extension efforts.

To help facilitate the communication between these groups, Jake Mowrer, Ph.D., held a “train the trainers” conservation and sustainable agriculture field tour at the Texas A&M University farm in College Station March 3. The workshop was designed to help them better promote the adoption of sustainable agriculture practices.

“Texas is lagging behind other states in the adoption of sustainable practices. Communicating the most current research to the scientists that work directly with farmers is key to changing practices,” said Mowrer, an Assistant Professor and AgriLife Extension Specialist in Soil Nutrient & Water Resource Management in the Department of Soil and Crop Sciences.

“More than fifty percent of the ag and natural resource county agents have less than five years of experience, and many could use more depth of training in our ag sciences,” he said. “There are many who were not raised on farms and whose degree training does not cover the breadth of the ag sciences.”

Mowrer points to the wide variety of agricultural enterprises across the states and the varying needs of the counties.

He believes that providing regionally relevant workshops will help ensure that those who are assisting the state’s producers are aware of current research that will best address those producer’s needs.

At the March 3 workshop, 47 people from AgriLife Extension Districts 9 and 11, NRCS zones 3 and 4, and Prarieview A&M University Extension took part.

Mowrer plans to hold another workshop at the Stiles Farm in Thrall, TX, on summer cover crops, double cropping, and tillage practices. Derrick Banks, Fort Bend County Extension agent for agriculture and natural resources, plans to hold one at PVAMU later in the spring.

These workshops are funded by a grant from Southern Sustainable Agriculture Research and Education (SARE).
We have seen them on TV, the crime scene investigators who sift through the minutia to help law enforcement personnel determine what took place.

Dr. Jacqui Aitkenhead-Peterson fills this role for those in Texas law enforcement looking for soil-borne answers.

An Associate Professor in the Texas A&M University Department of Soil and Crop Sciences, Peterson’s research focuses on nutrients in soil and water in human dominated ecosystems. Her research projects include urban irrigation run-off; extractable soil nutrients under tillage and cropping treatments; and investigation of carbon and nutrients released from decomposing mammals – primarily humans. It is the latter for which she has become one of the go-to sources for law enforcement.

For the past 6 years, she has been helping law enforcement discover the importance of matching soil from crime scenes and suspects or determining evidence of human decomposition products in soil.

In 2008, following a call from the Soil Science Society of America to increase undergraduate numbers in Soil Science, Peterson decided to develop and offer a Forensic Soil Science class. The first year, the class include included a field trip to the Huntsville donor facility.

“The extremely high concentrations of carbon, nitrogen and phosphorus from decomposing donors prompted my research and subsequent articles on this topic,” Peterson said. “Volunteering my expertise in sampling soil and on-site chemical analyses of soil at decomposition workshops for law enforcement or other practitioners led to initially helping to examine soil from cold cases and, more recently, active cases in Texas.”

Earlier this year, when asked to help locate remains for an ongoing case, Peterson called in some canine reinforcements.

These human remains detection (HRD) dogs were trained by Dr. Ben Alexander, an instructor in the Texas A&M Department of Biology. They “hit” on certain smells that are often undetectable to humans, and are a valuable tool, Peterson said.

“Dogs have a significantly higher sensitivity than the equipment in my lab,” Peterson said. “Sometimes the volume of soils delivered is high and so it is useful to have trained HRD dogs to alert for human remains before the time consuming chemical analyses is performed. If the HRD dogs show some interest then the next step is to scan sub-samples of the soils using UV-Vis-near infrared spectroscopy.”

“The diffuse reflectivity of decomposition-contaminated soils is significantly lower than soils collected as controls,” she said. “Statistical analyses will show whether it is worthwhile to continue on with wet chemical analyses to determine chemical markers for human remains.”

Recently, three HRD dogs examined soil evidence, for redundancy purposes, and then Peterson tested the soils in her lab. Information passed on to the investigators may help them find where a victim is buried, or provide other crucial information.

Aggies who wish to learn these techniques enroll in Peterson’s Forensic Soil Science Course, a three credit-hour course in which they learn soil and geologic characteristics associated with crime scene examination, and much more. This course draws numerous budding scientists each semester.
Aniruddha Maity, a Ph.D. candidate with Dr. Muthukumar Bagavathiannan, spent four months as a visiting scholar at the Australian Herbicide Resistance Initiative (AHRI) located at the University of Western Australia, Perth. He was part of the prestigious Endeavour Leadership Program, funded by the Australian government’s Department of Education and Training.

Under the supervision of Dr. Hugh Beckie, director- AHRI, Maity conducted research on seed biology aspects of herbicide-resistant and -sensitive populations of four important weed species, viz., annual ryegrass, brome grass, wild oat and wild barley, and connecting them with their herbicide resistance levels.

He plans to include the ryegrass (Lolium rigidum) study in his Ph.D. dissertation which is aimed to understand the physiological and molecular mechanisms of seed dormancy and shattering in another ryegrass species (Lolium multiflorum) prevalent in the United States as a major weed in wheat production.

“I am coming up with some promising species-specific techniques to break the seed dormancy in those four species,” he said. “I plan to publish those shortly.”

“Apart from the research, I was mesmerized by the beautiful landscape of Western Australia,” Maity said. “I especially liked the wonderful location of the university in Perth city beside the Swan river and blue water of the stunning Indian Ocean.”

Sympathies and Concerns

Please keep these members of our Soil & Crop Sciences family in your thoughts and prayers.

All those whose lives and careers were disrupted by the novel coronavirus, COVID-19.

The family of James “Shelby” Newman who passed away March 18. Shelby was a former student in the department and the previous director of the Texas A&M AgriLife Research and Extension Center - Stephenville.
April

4 - 8th Annual Geromino & Alligator Creeks Cleanup Event, New Braunfels & Seguin, TX  wling@tamu.edu
6-10 - Ranch Management University, College Station, TX
7 - Riparian and Stream Ecosystem Training, Bellville, TX
18 - Mill Creek Cleanup Event, Bellville, TX  Contact: wling@tamu.edu
16 - Undergraduate A & D Scholarship Banquet, Hildebrand Equine Facility, College Station
23-24 - Bennett Land Resource Management Workshop, Kerrville, TX

May

2 - Doctoral Hooding Ceremony, 10:00 a.m., Rudder Auditorium
7 - College of Agriculture and Life Sciences Commencement Ceremonies - 7:00 p.m.
13 - P&T meeting - Mid Term (if needed)
20-21 - McFadden Symposium, Manhattan, KS
25 - Memorial Day Holiday (CS campus)
27 - Septic System Workshop, Brenham, TX  Contact: wling@tamu.edu
27 - Healthy Lawns Healthy Waters Workshop, Gatesville, TX  Contact: johnwsmith@tamu.edu
28 - Healthy Lawns Healthy Waters Workshop, Lampasas, TX  Contact: johnwsmith@tamu.edu

June

6 - Stiles Farm Field Day, Thrall, TX
30 - Annual Eagle Lake Rice Field Day

Save the Date

July 9 - Annual Beaumont Rice Field Day
July 19-21 - Texas Turfgrass Assoc. Summer Conference, Horseshoe Bay, TX
July 23 - Healthy Lawns and Healthy Waters, Weslaco, TX  Contact: johnwsmith@tamu.edu
July 28 - Healthy Lawns Healthy Waters workshop, Mont Belvieu  Contact: johnwsmith@tamu.edu
October 3 - Healthy Lawns Healthy Waters Workshop, The Woodlands  Contact: johnwsmith@tamu.edu