The FIRST official event held January17 in the brand new Scott’s Miracle-Gro Lawn and Garden Research Facility.
Welcome back to all of our students and a special welcome to those that joined our department over the break. There are many exciting course offerings this semester and we look forward to a great semester. The recent cold spell turned the countryside brown, but with temperatures back in the high 70’s we can expect the spring flush soon. As I travel the state each spring to participate in annual reviews and various departmental activities, it is also amazing to see the variation across the state. We still have areas of Texas dealing with drought and other areas that really could use a few sunny days.

January has started off with a bang, with our statewide faculty and staff conference for AgriLife and the presentation of awards by the Vice Chancellor and AgriLife Agencies. Kudos to all our award recipients. Part of the AgriLife conference provided an opportunity for several of our teams to get together and welcome new team members and plan for the year. We also had a large contingent at the Belt-Wide Cotton Conference and many were recognized there. This week we have the Turf Grass Producers of Texas meeting at our new turf grass facility and Dr. Reynolds is hosting his turf grass short course in Rudder Tower.

I want to thank several of our former students for their end-of-year giving to the department. These funds provide a great deal to enhance our student learning experience, provide enhanced research support and ultimately make a difference for the producers of Texas.

Annual performance reviews for your staff need to be completed by mid-May to get them through the complete process by the end of May. I appreciate those who got an early start. Don’t forget that mid-term evaluations are due to the Department by April 30. Promotion lists including preliminary reviewers and draft documents are due by June 1. Thanks to all for getting set up with Google Scholar to facilitate the tracking of our publications.

A special note of appreciation to Betty Priest and Lindra Blum for their many years of dedicated service to the department. Careers like this truly make a positive difference for the department and we wish them the very best in their retirements. Thanks again!

We have a large number of visitors coming in to town this week and next as we are planning the future of Beachell Borlaug program with Monsanto, looking at Cassava research with CIAT, interviewing for the Monsanto-Borlaug Chair in Crop Improvement and interviewing for our extension weed science position.

It is exciting to participate in multiple visits with others around the campus to discuss major grant funding opportunities. A few examples this month include discussion on forages, soil security, UAV’s, wheat genetics, and bio products. Congratulations to each of you for vesting in this significant activity. Moving our department forward as a leader will require continued leadership by our faculty. Thanks to all!

We wish you the very best as we start 2017!

Dr. David Baltensperger
Department Head
Soil and Crop Sciences
dbaltensperger@tamu.edu
Dr. John Sweeten, center director at the Texas A&M AgriLife Research and Extension Center in Amarillo for the past 21 years, will hang up the many different caps he wears, retiring after 45 years of service to the Texas A&M University System.

In addition to his Amarillo duties, Sweeten was tasked with leading the AgriLife center in Vernon in 2008, at which time he began developing joint or complementing programs between the two centers. He also had a joint appointment with West Texas A&M University in Canyon for many years as a professor of agricultural engineering.

Sweeten came to Amarillo as a nationally recognized environmental systems engineer who specialized in air and water quality management from confined animal feeding operations after spending 24 years with the Texas A&M AgriLife Extension Service in College Station.

He also served as the associate department head of the Texas A&M biological and agricultural engineering department on campus for about five years during that time.

“It has been an honor to work with a man whose commitment to Texas A&M AgriLife Research and Extension programs in the Panhandle has had a major impact on the present and future success and long-term sustainability of Texas agriculture and the rural economy,” said Dr. Craig Nessler, AgriLife Research director in College Station.

Sweeten has worked nearly continuously with groups such as the Texas Wheat Producers Board, Texas Corn Producers Board, Texas Sorghum Producers Board, Texas Cattle Feeders Association, Texas Association of Dairymen, Texas Poultry Federation, Texas Pork Producers Association and the region’s groundwater conservation districts.

He served as a member and chair of a variety of commodity-related committees, and as the higher education representative on the Panhandle Regional Water Planning Group since its inception in 1999.

Chairing the Small Grains Advisory Committee for many years, he helped write the statewide strategic plan. Additionally, he helped establish the Corn Advisory Committee and write the Corn Production and Improvement Strategy to address major issues for producers in Texas in coordination with AgriLife Research and AgriLife Extension programs.

He also served as project director for two federal initiatives: Air Quality: Odor, Dust and Gaseous Emissions from Cattle Feedlots and Dairies, and the Renewable Energy and Environmental Sustainability Using Biomass from Dairy and Beef Animal Production Facilities.

Sweeten was selected to serve for three consecutive terms on the national Agricultural Air Quality Task Force, which advised the Secretary of Agriculture on issues related to agricultural air quality, including strengthening and coordinating U.S. Department of Agriculture research efforts and identifying cost-effective ways for the agricultural industry to improve air quality.

Sweeten is a co-creator of the Cooperative Research, Education and Extension Team, or CREET, which involves faculty and leadership with AgriLife Research, AgriLife Extension, Texas A&M Veterinary Medical Diagnostic Lab, West Texas A&M University and the USDA-Agricultural Research Service at Bushland. Most recently, the Texas A&M College of Veterinary Medicine and Biomedical Sciences has been added to the group.

“CREET has given us an amazing platform to address complex multi-disciplinary issues and incorporate other universities in selected programs for the advancement of knowledge and betterment of stakeholder opportunities,” Sweeten said.

Sweeten also has served as a member of the Amarillo Chamber of Commerce Agriculture Council, where he promoted agriculture and the AgriLife Research legislative initiatives during Panhandle/High Plains Days in Austin and DC Days in Washington, D.C.
Within Amarillo, he also served on the Harrington Regional Medical Center board of directors for many years.

Among his honors and awards are the TexasA&M AgriLife Vice Chancellor’s Award for administration, the national Distinguished Achievement Award from Epsilon Sigma Phi, an Environmental Excellence Award from the U.S. Environmental Protection Agency, an Environmental Excellence Award from the Texas Cattle Feeders Association, and being named a Fellow and recipient of the G.B. Gunlogson Countryside Engineering Award from the American Society of Biological and Agricultural Engineers.

Most recently, he was named the 2015 Texas Wheat Man of the Year by the Texas Wheat Producers Board.

“We want to thank Dr. Sweeten for his belief in collaboration, cooperation and sharing to get things done for the good of our constituents,” Nessler said. “He worked hard to join together the brightest minds this region had to offer in the areas of small grains research, environmental research and soil and water conservation.

“We would like to thank Dr. Sweeten for all he has given to us and of himself for the betterment of the agriculture industry in this region, state and nation.”

Sweeten said he has enjoyed working with the many different leaders, faculty, staff and stakeholders over the years and being a part of some very creative and important research along the way.

“Amarillo-based research faculty have made remarkable advancements in beef cattle nutrition and health, environmental quality, water management, wheat breeding and genetics, plant disease and insect management, crop stress physiology and alternative cropping systems,” he said.

“Amarillo has been an outstanding place to recruit and retain outstanding faculty and support staff to leverage grants that extend research capabilities and accomplishments far beyond the state funding afforded by AgriLife Research. Interagency and producer cooperation continues to be tremendous.”

Sweeten said the next chapter in his life will include a move that will allow closer proximity and a greater investment of time and energy into family members, as well as a modest Texas Hill Country ranching operation. He also intends to enjoy a measured amount of professional involvement and engineering consulting opportunities as they may arise.

Aggie Turf Club
The Aggie Turf Club is gearing up for the STMA and GCSAA conferences.

Kirstin Burnett, Trevor Austin, Syed Ahmed, and Jose Polanco will be attending the STMA meeting in Orlando Jan 24-27th.

Kevin Hejl, Scott Gee, Sam Irwin, Calvin Wilson, and Kevin Cloud will be attending the GCSAA Conference in Orlando Feb. 6-9th.

At both events the students will be competing in the Collegiate Turf Challenge Competitions.

Aggie Turf Club meets every other Wednesday of the semester at 5 pm in 440 Heep.

Club meetings will begin in early February.
2016 AgriLife Awards

Vice Chancellor’s Award for Excellence

W. Brandon Smith received the Vice Chancellor’s Award for Excellence in Graduate Research at the AgriLife Conference January 9, 2017, in College Station.

According to Dr. Mark Hussey, vice chancellor and dean of agriculture and life sciences at Texas A&M, the Vice Chancellor’s awards represent the highest level of achievement for AgriLife.

Brandon is working on his Ph.D. in Agronomy under Dr. Monte Roquette and Dr. Luis Tedeschi. His research focus is supplementation of stocker cattle while grazing bermudagrass pastures.

Soil and Crop Sciences faculty, Drs. Gaylon Morgan, Peter Dotray, and Wayne Keeling received recognition for superior service during the AgriLife Conference January 10.

Dr. Gaylon Morgan received the Superior Service Award for Extension Specialist.

Morgan is a Professor and State Cotton Specialist. He joined the A&M faculty in 2003 as the Small Grains Specialist, taking the position as cotton specialist in 2009.

“I was honored to be recognized by Texas A&M AgriLife Extension with this award. However, the accomplishments within the Extension Cotton program would not have been possible without the significant contributions from Dale Mott, Linda Francis, graduate students, and collaborating colleagues from across the state and nation,” Morgan stated.

“Additionally, the support and flexibility of the administration to allow me to conduct Extension Cotton programming has been greatly appreciated,” he continued. “The financial support of the cotton industry has been essential to conducting and delivering timely and unbiased information to the cotton producers of the state.”

Drs. Peter Dotray and Wayne Keeling were part of the North Region - Cotton Resistant Weed Management Team which received an AgriLife Extension Superior Service Team Award.

The team includes: Dotray, Keeling, Jody Bradford, Josh Brooks, Mark Brown, Leonard Haynes, Terry Millican, Caitlin Jackson, Blayne Reed, Gary Roschetsky, Kerry Siders, and John Villalba.

“This project focuses on education and awareness of herbicide resistance, and the development of strategies to best manage herbicide-resistant weeds,” said Dotray.

“On the research side, we are trying to better understand the biology and ecology of Palmer amaranth in order to control the glyphosate-resistant variety which is now widespread across the Texas southern high plains,” he continued. “We are also examining how new herbicide active ingredients and formulations, and new crop technologies will assist in the management of herbicide resistant weeds.”
Congratulations to our Departmental Awards Recipients!

B.B. Singh Faculty Research Award
Dr. David Stelly

Research Collaboration Award
Neha Kothari

Graduate Student Teaching Award
W. Brandon Smith

Extension Faculty Award
Dr. Sam Feagley

County Extension Agent Award
Josh Blanek

Administrative Support Award
Amanda Ray

Research Collaboration Award
Neha Kothari
Departmental Award Winners Continued

Research Support - Field Award
Bryan Simoneaux

Research Faculty Award
Dr. Qingwu Xue

Special Service Recognition
Don Jones - Cotton Inc.

Faculty Teaching Award
Dr. Jacqui Aitkenhead-Peterson

Technical Staff Award - Lab
Jennifer Chagoya

Undergraduate Student Support Award
William Peebles

Not Pictured:  Technical Staff Award - Field: Danny Meason; Research Support Award - Lab: Nicole Cherry Graduate Student Research Award: Yong Chen
Special Recognition for Administration
Department Head 10 years
Dr. David Baltensperger

Special Recognition for Administration
Associate Department Head 15 years
Dr. C. Wayne Smith

Special Recognition - 36 years of Service
Dr. Ed Runge

Service Pin - 30 years
Dr. C. Wayne Smith

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

Dr. George “Alva” Niles and his family as they mourn the loss of his wife of 68 years, Pauline “Polly” Niles who passed away December 30. Dr. Niles taught several classes while at A&M, including plant breeding and host plant resistance. He retired from Soil and Crop Sciences in 1986.

Kathleen Peacock and her family as they mourn the loss of her grandfather, Levi Gillespie, who passed away January 5. Kathleen is the Soil and Crop Sciences Business Coordinator.

Dr. Larry Redmon and his family as they mourn the loss of his father, Billy Lee Redmon, who passed away January 17. Funeral services will be held Friday, January 20 in Normangee. Dr. Redmon is our Associate Department Head and Extension Program Leader.
In a recent article in Nature News, the “fight for funding” was voted as the biggest challenge faced by early career scientists. It also reports that many early career scientists have considered quitting their research career due to immense pressure to establish a successful research program. As new faculty members, many of us might have gone through similar situations. Some may be lucky to inherit a successful, established research program, but many will face the challenge of building a research program from scratch or with limited available resources. Whatever might be the case, there are some strategies that early career faculty can follow to assist them in developing a successful research program.

**How Do I Find Funding?**

It is important to be aware of all the potential funding opportunities out there. So, be ready to spend the first few months in your new position exploring different types of funding avenues ranging from federal organizations to industries and local commodity groups. All these agencies have funding opportunities available that vary in size and scope. It is up to you to actively seek them. It is important to thoroughly read the Request for Applications (RFA). Sometimes, these RFAs can be lengthy; however, a thorough reading can help you understand not only the goals of the funding agencies and their programs, but also the guidelines for proposal preparation. Sometimes universities organize grant-writing workshops targeting specific funding agencies such as the National Science Foundation (NSF) or the National Institute for Food and Agriculture (NIFA). There are also sessions organized by the Early Career Members Committee as part of the ASA, CSSA, and SSSA Annual Meetings. Take time to attend these workshops early in your career. Remember, you can have the best idea in the world, but if you do a poor job of proposal preparation, then you may not get the results you were expecting.

As the lead principal investigator, you will write the major portion of the proposal. You prepare the first draft of the proposal early so that you can obtain input and improvements from your collaborators in a timely manner. It is important to have a good draft as it helps the collaborators to streamline their thoughts in writing their sections. Once you have a full proposal draft ready, ask your collaborators to critically read it again like a proposal reviewer might do. You can also ask your friends or mentors to provide critical input. Revise it accordingly. All of this takes time, so an early start is important. Once you start writing proposals and invite other colleagues to join your effort, many will understand your program better and may invite you to participate in their proposals. That will also increase your chances of getting grant funding.

**Don’t Panic If You Don’t Publish in the First Year**

When I started my career, I was bombarded by the phrase “publish or perish” from all corners. In a sense, it is true since the success of our program and eventual tenure and promotion depends on having an adequate number of publications. What were my options when I just started my job? I could have tried publishing papers using data that were collected when I was a postdoctoral research associate, or I could have written a review paper, but for me, all those options were taking time away from my pursuit of funding and starting my research program. So, I spent this early time meeting people, developing collaborations, collecting necessary preliminary data, and writing numerous grant proposals. As a result of my successful grant attempts, I was publishing at an acceptable rate by my third year. The key is not to let early criticisms discourage you just because you didn’t have publications in your first year. Once you have a robust research program under way, the resulting publications will more than make up for your early inactivity in publishing.
Be Your Own Project Manager

“Be your own project manager” was advice that I received in a program for early career faculty. I used to be overwhelmed with managing different aspects of my program, from personnel to budgeting to field operations. Now I allocate some time each day or week just for planning different aspects of my program. Better planning can help you use your funds effectively, hire the right personnel, plan field activities, and make the project run more smoothly with fewer “surprises.”

Seek Mentors

If your university doesn’t have a formal mentoring plan, then find mentors on your own. It could be colleagues within your department or it could be someone from outside your department or university. After talking to a few colleagues, you will be able to determine the ones who are good mentors for you. All faculty are busy, but if they are finding time to talk to you and advise you and show a genuine interest in helping you, then those mentors are right for you.

Deal with Setbacks

Research rarely follows the plans perfectly. What if you couldn’t finish harvesting your field plots before that big rain? What if you didn’t get that grant after working on the proposal for months? What if your first hire didn’t go as well as planned? What if you couldn’t send that project report before the deadline? Be prepared to face these challenges, but recognize that the occasional setback isn’t the end of the world. Learn from your setbacks in order to be better prepared for them in the future. Do some introspection, and be a good critic of yourself. What can you change about how you do research that might reduce the chances of future setbacks? Whatever might be the reason, take time to re-plan your activities and, if necessary, re-shape your goals.

A new semester has started!

Welcome back Ags.

and a big HOWDY! to any new students joining us this semester!
Texas A&M AgriLife Research wheat breeders will continue to build on their development of hybrid wheat varieties through a joint grant with the University of Nebraska-Lincoln.

The U.S. Department of Agriculture’s National Institute of Food and Agriculture and the International Wheat Yield Partnership are jointly funding a three-year grant for $975,000. The grant, titled “Developing the Tools and Germplasm for Hybrid Wheat” will involve Texas A&M’s Dr. Amir Ibrahim, a wheat breeder in College Station, and Dr. Jackie Rudd, a wheat breeder in Amarillo.

The first year of funding has been released with the last two years subject to release based upon continued progress in the grant research.

The project will be led by Dr. Stephen Baenziger, University of Nebraska-Lincoln small grains breeder; and also include Dr. Bhoja Basnet, International Maize and Wheat Improvement Center, known as CIMMYT, hybrid wheat breeder, El Batan, Mexico; Dr. Friedrich Longin, University of Hohenheim wheat breeder, Stuttgart, Germany; Dr. Jesse Poland, Kansas State University geneticist, Manhattan, Kansas; and Dr. Jochen Reif, Leibniz Institute of Plant Genetics and Crop Plant Science department head, Gatersleben, Germany.

Individually, the project team has made great strides in the U.S. and abroad toward developing the tools to foster hybrid wheat development to maximize wheat yield potential, Ibrahim said.

Using an integrated approach involving in-house germplasm, chemical hybridizing agents, breeding, phenotyping, genomic selection and quantitative trait loci mapping, the researchers expect this project to help create scientific and germplasm foundations for successfully launching the hybrid wheat industry in the U.S.

To feed a larger global population with increasing dietary needs, Ibrahim said wheat yields need to increase by 1.7 percent per year. Currently, yields are only increasing 0.9 percent annually.

Ibrahim said hybrid crops have increased vigor over the two parents in yield and other traits. In hybrids, the female parent does not produce viable pollen, but is used as a seed plant. The male parent has the role of pollinator. Together they have the capacity to combine and express hybrid vigor.

For wheat, past conventional breeding efforts increased hybrid vigor about 10 percent, but Ibrahim said they want to get that figure in the range of 15-20 percent to make it attractive to producers.

“We believe hybrid wheat, which is more climate resilient than pure-line wheat, can contribute to achieving this goal,” he said.

Ibrahim said there are two systems for producing seed: chemical hybridization agents, which kill the anthers on the female; and the male sterility system, which includes breeding females and males separately and making selections based on the best combination.

The effort now is aimed at developing cytoplasmic male-sterile females and male parents by breeding fertility restoration genes into them, he said. A minimum of three fertility restoration genes is needed in the males. This genetic system is very slow.

Ibrahim and Baenziger have been working jointly toward the development of hybrid wheat since 2013, testing more than 600 lines of hybrid wheat varieties in Nebraska and Texas.

In this new project, the objectives will include continued screening of these two large wheat breeding programs for the floral and plant traits needed for efficient hybrid seed production and hybrid performance.

The researchers are also tasked with creating and testing hybrids to establish and confirm heterotic pools in wheat, and to genotype the lines going into the heterotic pools to improve algorithms to separate lines into maximum likelihood pools for future testing and validation.

Additionally, they will map restorer genes and create a series of cytoplasmic male sterility, or CMS, tester lines – the maintainer lines – and a series of elite restorer lines, or R-lines, to begin to determine the efficacy of CMS-based hybrid systems.

Ibrahim said it will take several more years to successfully maximize hybrid vigor, but through this collaboration the first commercially available and affordable hybrid wheat seed should be available to producers sooner.

Texas A&M AgriLife Research will play a role in the development of hybrid wheat to maximize wheat yield potential.

Texas A&M AgriLife Research will play a role in the development of hybrid wheat to maximize wheat yield potential.
Dr. Richard Vierling has been selected to lead the Texas A&M AgriLife Research and Extension Center and Texas Foundation Seed, both headquartered at Vernon, according to Dr. Craig Nessler, AgriLife Research director in College Station.

Vierling will start Feb. 1, filling the vacancies left by the retirement of Dr. John Sweeten and the death of Steve Brown, longtime Texas Foundation Seed director.

“We feel very fortunate to have Dr. Vierling join our Texas A&M team, bringing with him a tremendous amount of experience and expertise,” Nessler said. “His knowledge of the grain industry and working with outside investors will serve us well moving forward.”

“I look forward to working with the faculty and staff at the AgriLife center and Foundation Seed as we look to the future,” Vierling said. “The agricultural industry is on the verge of disruptive changes in how we do research, business and interact with our stakeholders. These disruptive changes bring incredible opportunities for us all.”

Vierling has served as the National Corn Growers Association director of research and business development for the past six years. Prior to that, he was a faculty member at Purdue University and director of the Indiana Crop Improvement Genetics program.

He earned his bachelor’s and master’s degrees from the University of Missouri and his doctorate from Texas Tech University.

While with National Corn Growers, Vierling was responsible for business development for farmers and agricultural companies, writing the vision and business plans for the research team along with coordinating national and state research programs and initiatives.

He led all aspects of research advocacy with federal agencies and technical staff for congressional lobbying, as well as managed national research programs including the grant process, yearly budget development and management of consultants.

Additionally, he formed the Cross Commodity Research Group to bring together research directors from corn, cotton, sorghum, soybean and wheat to align production research.

While at Purdue, he was tasked with turning around a struggling genetics testing program. This included writing two strategic plans and multiple business plans as well as negotiating technology acquisition agreements with Los Alamos National Laboratory, NASA and the Indiana State Chemist’s Office.

Under his supervision, the Indiana Crop Improvement Genetics program was the first research laboratory to be ISO 9000:2001 certified, which primarily deals with quality management systems.

When working with NASA, he was selected team leader for three experiments performed on space shuttle missions. He built a team consisting of scientists from two NASA centers, industry and three universities.

The first plant transformation experiment was performed on STS-95, which was the launch on space shuttle Discovery in December 1998 with Sen. John Glenn, who performed the experiment. The second experiment was launched in April 2000 and the third was lost as a result of the Space Shuttle Columbia disaster.

Vierling also led the soybean research group that won the Dean’s Team Award for interdisciplinary research at Purdue University. His soybean pest resistance licensed technology won the 2000 FinOvation Award as the best new agricultural technology.

He, in collaboration with three other faculty members, developed the world’s first usable, broad-based, complete soybean cyst nematode, or SCN, resistant germplasm. The SCN-resistant material was highlighted in a 1999 Purdue Research Foundation report as one of the top 10 commercialized technologies from Purdue University.

Vierling also was key in licensing soybean peroxidase technology for diagnostics. The soybean peroxidase conjugate for medical diagnostics has been licensed to American Qualex and is now available to medical researchers and diagnostic kit manufacturers. He wrote the patent applications and continually works with licensees to aid their efforts to use the technology.

Additionally, he licensed a patented enzyme technology for the human clinical diagnostic testing industry.

Vierling is a member of and has served on the research board of the American Seed Research Foundation and with multiple committees of the American Seed Trade Association.
Many ornamental plants popular in Central Texas landscapes can still grow and thrive when watered using half or less of the usual recommended irrigation amounts, according to research results recently published by two Texas A&M AgriLife institutes.

A drought survivability study, conducted in San Antonio throughout 2015, investigated how 97 plant species common to the region fared when watered with varying amounts over a six-month period.

The study found when watered in small amounts most of the plants remained lush, meaning they had adequate moisture and new growth, and some remained stable even with zero irrigation, according to Amy Uyen Truong, Texas A&M AgriLife Extension Service assistant with the Texas A&M Institute of Renewable Natural Resources and the Texas Water Resources Institute in College Station.

Truong co-authored the report with Dr. Richard White, Texas A&M AgriLife Research turfgrass management scientist; Forrest Cobb, IRNR research assistant, and Dr. Roel Lopez, IRNR director. Results were recently published in the Texas Water Resources Institute’s Technical Report-495, which can be found at http://twri.tamu.edu/publications/reports/2016/tr-495/.

“Based on this study’s findings, Central Texas landscapes can thrive on a lot less water than most people are using today,” Truong said.

In fact, she said, the study showed 21 percent of the plant species tested could withstand a 12-week drought in Central Texas without any supplemental irrigation or rainfall.

“And 54 percent remained stable and some were lush at just 20 percent potential evapotranspiration,” she said.

Potential evapotranspiration, or ETo, is the amount of water a plant loses every day, and 70 percent of this amount is the estimated average watering rate of residential landscapes in Texas, according to the Texas Water Development Board.

“This research provides a comprehensive evaluation of diverse ornamental plants that will help consumers make smart decisions to produce more sustainable landscapes,” White said.

Because of Central Texas’ variable weather and rainfall, and its history of prolonged periods of drought, it was important for the study to quantify how little water plants need to survive droughts or watering limits, Truong said.

“These results can help not only those residents who want to reduce their outdoor water use without sacrificing an aesthetic landscape, but also business owners and professional landscapers,” she said.

The water board also estimates outdoor water use accounts for 22 to 50 percent of total residential use in Texas.

“So, reducing outdoor water use could make a huge dent in the state’s water demand, especially during drought when peak water demand is especially high,” Truong said.

The study was supported by AgriLife Research, San Antonio Water System, the cities of Austin and Georgetown and the San Antonio River Authority.

One of the reasons for funding this research project was to educate the public about plant performance during drought-like conditions,” said Christopher Charles, conservation program specialist for the city of Austin. “Plants purchased at local nurseries and home-improvement stores often do not come with specific watering instructions for our Central Texas region. We believe this study will help decrease the need for supplemental watering.”

The study consisted of a 5,000-square-foot demonstration site, divided into four plots, each filled with all 97 of the plants being studied. After planting, a three-month establishment period of watering at recommended levels ensured that the plants were healthy and established.

“This establishment period is key to drought-tolerant landscape success,” Truong said.

The plants in each of the four plots were subjected to four...
different drought treatments: no water, 20 percent, 40 percent and 60 percent of potential evapotranspiration. The study used a large movable roof to make the zero ETo plot possible, Truong said, with the roof moved over that section used for the study when there was rain.

“The difference between the 0-percent ETo plot and the 20 percent ETo plot was striking,” Truong said. “Watering these plants with just 20 or 40 percent ETo, instead of the usual 70 percent, resulted in many plants remaining stable or lush and aesthetically pleasing.”

Truong said the study also showed no difference in appearance for stable and lush between the 40 percent and 60 percent ETo plots, even though the 60 percent plot received 8 gallons more water per plant over the 12 weeks.

“Multiply those potential water savings across the vast amounts of residential and commercial landscapes in Central Texas and the savings would be significant,” she said.

Plants such as oleander and anacacho orchid performed best in all four of the watering scenarios.

Truong and the study’s other authors recommend planting groups of plants that have similar reactions to water stress to help reduce water waste, avoid plant replacement costs and ensure aesthetic appeal.

“After an establishment period, plants such as cenizo, fall astar, gaura, oleander and Mexican feathergrass remained lush or stable with no additional water and could work well together in a water-wise landscape,” she said.

Truong said most utilities allow home or business owners to apply for “variances” in drought watering restrictions for landscapes being established and needing additional water.

More than 50 local volunteers, Master Gardeners and Master Naturalists helped make the study possible, Truong said.

While helping plant and weed the plots, the volunteers got to see firsthand how the plants were performing with little water, and many were interested in using more drought-tolerant plants in their own landscapes, she said.

For more information, read the study report at http://twri.tamu.edu/publications/reports/2016/tr-495/ or contact White - rh-white@tamu.edu or Truong - Uyen.Truong@ag.tamu.edu.

Soil and Crop Sciences Faculty involvement at American Geophysical Union Meeting

Dr. Jacqueline Aitkenhead-Peterson and Dr. Dirk Hays were invited presenters at the annual American Geophysical Union (AGU) meeting in San Francisco.

Dr. Aitkenhead-Peterson presented a poster titled “Suburban Soils: Are they the answer in determining factors controlling non-point-source DOC and DON in urban surface waters?”, as part of the session titled “Changing Biogeochemistry of Urban Rivers and Current Mitigation Efforts.

She has been involved with the AGU for the past 17 years, presenting ten oral presentations, two posters, serving as a session convenor twice and judging at three meetings.

Dr. Dirk Hays gave an oral presentation titled “Developing ground penetrating radar (GPR) for enhanced root and soil organic carbon imaging: Optimizing bioenergy crop adaptation in the Biogeosciences section of a session titled “Revealing the Hidden Half” - Advances in Imaging and Quantification of PlantRoots and Root-Soil Interactions.

Dr. Nithya Rajan and her Post-Doctoral Research Associate, Dr. Sanaz Shafian, co-convened a session on Unmanned Aerial Systems (UAS) Applications in Agriculture and Natural Resource Management. As the convenors, they were responsible for inviting presenters and moderating the presentations during the meeting.

Rajan was also a co-convenor for a session on biofuel-induced land use changes with Dr. Srinivasulu Ale of Texas AgriLife Research in Vernon.

The AGU is the largest Earth and Space Science meeting in the world, with approximately 26,000 attendees in 2016. 2016 marked the 50th year for the conference, which was held December 12-16, at the Moscone Convention Center in San Francisco, California.
Adoption of cover crops in the Rolling Plains has been slow as questions persist on water use and benefits. But after compiling economic data this past year, one Texas A&M AgriLife researcher is asking producers, “Can you afford not to adopt cover crops?”

Dr. Paul DeLaune, Texas A&M AgriLife Research environmental soil scientist in Vernon, said irrigated producers especially could potentially be reaping more dollars per acre if they include a cover crop on their continuous cotton.

DeLaune has been researching conservation tillage and cover crop effects on soil moisture and soil properties for the past eight years in the semi-arid environment of the Rolling Plains, with much of the data collected during an exceptional drought period.

He will be talking in detail about agronomic and economic impact of cover crops in cotton systems at the Beltwide Cotton Conference in Dallas Jan. 5-7 and the Red River Crops Conference in Childress Jan. 24-25.

“Water is often the limiting factor to crop production, so anything that is perceived to reduce the capability of soils to capture and retain rainfall hinders adoption,” he said.

Conservation tillage, which has shown benefits in regard to rainfall retention and storage, has been a hard sell in Texas, DeLaune said, with only about 16 percent adoption. So he expects cover crops to have an even lower adoption rate.

However, there has been much more promotion and excitement for cover crops due to the U.S. Department of Agriculture Natural Resources Conservation Service Soil Health Initiative, he said.

DeLaune said it is true after five years of research, he had hoped to see a buildup of organic carbon – but didn’t. But he did see a reduction in the overall soil compaction and an improvement in water infiltration.

“The stored soil water at the time of termination of a cover crop will be lower, but when the rain does come, the infiltration rate is higher, and prior to the cash crop being planted, it seems to be recharging well,” DeLaune said.

Termination date can be important. Too early and the beneficial residue is lost, he said, adding they terminate about a month before planting.

“If you terminate early, the residue goes away quickly,” DeLaune said. “So when do you pull the trigger on termination? Let it get a little further along so the residue remains. Our infiltration data shows it will definitely be a benefit.”

In continuous cotton systems, he said his research has shown that infiltration did not differ between conventional till and no-till systems.

“But we did see a significant increase in infiltration when a terminated wheat cover crop was added to the system. In a low-residue system such as continuous cotton, no-till alone does not seem to be as beneficial in regard to infiltration, although we have seen alleviation of plow pans with no-till.”

The continuous dryland cotton system he has researched included trials of conventional till, no-till and no-till with a mixed species cool-season cover crop, as well as monocultures of crimson clover, hairy vetch, Austrian winter field pea and wheat cover crops.

Over a three-year average, expenses were significantly lower for the no-till system than all other systems except the wheat cover crop system, he said. Seed is a major factor and wheat has a much lower seed cost compared to other evaluated cover crop options.

In less humid regions, it is important to consider reasonable cover-crop seeding rates and not try to emulate high seeding rates that may be seen in cooler or wetter climates, DeLaunesaid. Within the dryland study, economic returns were not significantly different between cover crop and non-cover crop treatments.

“Although we have seen significant soil moisture use by cover crops, we have maintained lint yields with cover crops,” he said.

On irrigated cotton, the lint yield and net return were higher for the mixed cover crop and wheat cover crop systems in the third year of the trial. On the three-year average, per-acre net returns were $355 for no-till, $367 for conventional till, $398 for wheat cover crop and $406 for mixed species cover crop systems.

Added residue, either through crop rotation or cover crops, is a benefit to cotton systems in semi-arid environments, he said. Risks are much greater in dryland systems, but success can be found with educated management decisions.
Texas Watershed Steward workshops have been scheduled for January 25 in Edna, and February 7 in New Braunfels.

On January 25, the meeting will focus on water quality related to the Lavaca River. It will be held from 1-5 p.m. at the Jackson County Services Building, 411 N. Wells St., Edna.

The meeting is presented by the Texas A&M AgriLife Extension Service and the Texas State Soil and Water Conservation Board in cooperation with the Texas Water Resources Institute.

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In improving water quality in their region. Participants are encouraged to pre-register at the Texas Watershed Steward website at http://tws.tamu.edu.

Both workshops will include a discussion of watershed systems, types and sources of water pollution, and ways to improve and protect water quality. There also will be group discussions on community-driven watershed protection and management.

According to organizers, the workshops will include an overview of water quality and watershed management in Texas, but each will primarily focus on local area water quality issues and efforts to protect the local rivers.

“The Lavaca is a treasured natural resource of the state of Texas for such activities as fishing and is essential wildlife habitat,” said Dr. Allen Berthold, research scientist for Texas Water Resources Institute (TWRI).

He said TWRI and AgriLife Extension encourage local residents and other stakeholders to attend the workshop to gain information about water resources, water quality improvement and watershed protection.

Mark Enders, watershed coordinator for the City of New Braunfels, encouraged residents to attend since Dry Comal Creek and the Comal River both play vital roles in recreation, endangered species habitats and the regional economy.

Attendees at both workshops will receive a copy of the Texas Watershed Steward Handbook and a certificate of completion.

The Texas Watershed Steward program offers four continuing education units in soil and water management for certified crop advisers, four units for professional engineers and certified planners, four credits for certified teachers and two credits for nutrient management specialists. A total of four professional development hours are available for professional geoscientists.

In addition, three general continuing education units are offered for Texas Department of Agriculture pesticide license holders, four for certified landscape architects and three for certified floodplain managers. Four continuing education credits are offered for each of the following Texas Commission on Environmental Quality occupational licensees: wastewater system operators, public water system operators, on-site sewage facility installers and landscape irrigators.

“Participating in the Texas Watershed Steward program is a great opportunity to get involved and make a difference in your watershed,” Kuitu said.

The Texas Watershed Steward program is funded through a Clean Water Act nonpoint source grant from the Texas State Soil and Water Conservation Board and U.S. Environmental Protection Agency.

For more information on the Texas Watershed Steward program and to preregister, go to http://tws.tamu.edu or contact Kuitu at 979-862-4457, mkuitu@tamu.edu
Texas A&M AgriLife Research’s wheat genetic and breeding programs will have genes in play when a multi-state, multi-agency project establishes a nationally coordinated consortium to advance wheat yields.

Developers of the project said surveys of state wheat-grower associations have repeatedly shown grain yield is the main priority for producers and the main determinant of their profits. Increases in kernel weight will also benefit grain millers, because this trait is highly correlated with increases in flour yield.

The project was developed because increases in the global wheat production required to feed a growing population is currently hampered by limited knowledge of the genes controlling wheat yield. Identification of these genes is a necessary first step to understand how they interact and shape the pathways that regulate yield.

Genetic variations of grain yield and its components can be used to identify candidate genes, such as those in TAM 111, and the use of new genomic tools will provide a unique opportunity to clone the underlying genes, Liu said.

The U.S. scientists will partner with International Wheat and Maize Improvement Center, or CIMMYT, researchers to transfer these underlying genes into wheat lines from CIMMYT in Mexico to be used to improve varieties worldwide, he said.

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The group also identified a long-term constraint to future increases in wheat production in the U.S. as the limited number of trained plant breeders. This project will train 15 doctoral students in plant breeding, integrating field, laboratory and bioinformatics skills, including the one with AgriLife Research.

According to the project outline, public breeding programs within the universities are essential to providing plant breeding students with integrated training, including field and laboratory experiences. Centralized workshops will allow doctoral students to benefit from the collective group expertise.

Additional expected research outcomes include finding perfect markers for genes regulating grain yield components and develop genotypic and phenotypic information for a large number of breeding lines organized in a database to serve wheat breeders worldwide.
For more than a decade, the Texas Bacterial Source Tracking Program has improved the identification process for bacterial pollution sources in watersheds across Texas, helping restore water quality and protect human health, according to a Texas Water Resources Institute official.

“Because of the efforts of this joint program with the Texas Water Resources Institute, Texas A&M AgriLife Research and The University of Texas Health Science Center at Houston School of Public Health in El Paso, bacterial pollution sources in watersheds can now be characterized more precisely,” said Dr. Kevin Wagner, Texas Water Resources Institute deputy director, College Station. “As a result, we can now take more targeted and effective approaches to watershed restoration.”

The program is made up of a team of researchers, including Wagner, Dr. Terry Gentry of AgriLife Research’s department of soil and crops sciences, Dr. George Di Giovanni of the UT Health School of Public Health in El Paso, Dr. Lucas Gregory of TWRI, and others.

“The program has filled a need in the state’s water quality efforts that no other program was delivering, that of in-stream measurements of human and animal sources of bacterial pollution,” Wagner said.

He said identifying bacterial pollution is important because bacteria is the No. 1 pollutant of Texas water bodies, with 255 water bodies currently failing to meet water quality standards due to excessive levels of bacteria.

Bacterial source tracking, or BST, is an assessment tool that uses DNA fingerprinting and other genetic and phenotypic tests to differentiate between wildlife, pets, livestock or human sources of fecal bacteria, including *E. coli*, bacteroidales and enterococci, according to Di Giovanni.

“The premise is that DNA fingerprinting can identify source-specific bacterial strains that have adapted to the unique gut environments of different animal hosts,” he said.

Gregory, who has been involved in the collection of known source fecal samples and data assessment, said *E. coli* is the state’s indicator bacterium of choice for assessing the safety of fresh water for swimming and other recreation. Water samples with *E. coli* are cultured in a lab and analyzed using DNA fingerprinting. The researchers also DNA fingerprint *E. coli* collected from the predominant animal species in the watershed.

“The tendency of feral hogs to concentrate in riparian zones may exacerbate their impact in rural watersheds,” Gentry said.

“Livestock can also be substantial contributors of *E. coli*, but they generally have lower contributions than computer models estimate,” he said. “Agricultural best management practices, such as rotational grazing, riparian protection and providing alternative water supplies, can greatly decrease both livestock and wildlife contributions.”

Di Giovanni said the team’s findings have led to a better understanding of human health risks for recreation in rural water bodies impaired with bacteria from wildlife.

“Although wildlife feces may be a source of zoonotic pathogens, that is, those transmitted from animals to humans, generally speaking the risk to humans may be lower than exposure to water contaminated with human sewage,” he said.

Over the years, the team has expanded the number of animal species and regions represented in a statewide sampling library for which Di Giovanni’s and Gentry’s labs oversee and maintain data and bacterial culture collections.

Di Giovanni said the library currently contains more than 1,700 *E. coli* DNA fingerprints obtained from more than 1,500 different domestic sewage, wildlife and livestock fecal samples, representing more than 50 animal subclasses from throughout Texas. These isolates were selected after screening more than 6,700 *E. coli* samples from almost 3,000 fecal and sewage samples collected through 18
projects completed throughout the state.

Gentry said initially differences in methods, inconsistent approaches and limited geographical coverage of library sampling caused concern over the applicability of BST results between watersheds.

“But through the years, we have been able to allay those concerns by focusing on increasing application, capacity and coverage of bacterial source tracking resources available in the state,” he said. “In doing so, we have been able to accomplish several of the research and development needs recommended by a statewide task force on bacterial source tracking.”

Wagner said before BST many computer models attributed much of the bacterial contributions to cattle because this was one of the few sources for which there was sufficient data.

“But BST helped us confirm what many landowners suspected — that cattle were only part of the contributions; on average, cattle contribute about 13 percent of E. coli in the rural watersheds studied to date,” he said.

The Texas State Soil and Water Conservation Board has funded the program since its inception. The Texas Bacterial Source Tracking Program has been used in water restoration efforts in 14 watersheds, including Buck Creek, which was delisted from the state’s impaired water body list in 2010, Wagner said. Buck Creek’s restoration efforts were recognized as a success story by the U.S. Environmental Protection Agency and awarded a 2013 Texas Environmental Excellence Award.

DiGiovanni said segments of the Leon and South Leon Rivers were also delisted in 2014, due in part to management of pollution sources identified through the program.

“BST has been incredibly helpful in every watershed where we’ve used it,” Wagner said.

The program is now turning to water quality efforts in urban watersheds, Wagner said.

“We’re really turning our attention to try to do more of this work in more urbanized settings,” he said. “In predominantly rural watersheds, wildlife contributes about half of the bacteria. We’ll see if that differs in urban settings or not.”

For more information on the program, go to http://texasbst.tamu.edu/

Water well owner training to be held in Port Lavaca

A private water well management training conducted by the Texas Well Owner Network, or TWON, will be held Jan. 24 in Port Lavaca.

The training, which is free and open to the public, will be from 8 a.m.–3:30 p.m. at the Texas A&M AgriLife Extension Service office in Calhoun County, 186 Henry Barber Way.

“Lunch will be provided courtesy of the local groundwater conservation districts,” said Drew Gholson, AgriLife Extension program specialist and network coordinator, College Station.

He explained that the TWON program is for Texas residents who depend on household wells for their water needs, so they can learn about improving and protecting their community water resource.

“The program was established to help well owners become familiar with Texas groundwater resources, septic system maintenance, well maintenance and construction, and water quality and treatment,” Gholson said.

He said participants may bring well-water samples for screening. The cost is $10 per sample, due when samples are turned in.

Space for the trainings is usually limited, so attendees are requested to register at http://twon.tamu.edu/training or by calling 979-845-1461 as soon as possible.

The Llano Estacado Cotton Conference

hosted by the Texas A&M AgriLife Extension Service will be held in Muleshoe, TX, January 30 from 8:00 - noon in the Bailey County Electric Cooperative meeting room, 610 E. American Blvd.

Registration is $20 at the door.
**January**

17-20 - Turfgrass Ecology and Management Short Course - Rudder Tower
18 - Global Pulse Day - more info at http://pulses.org/global-pulse-day
24-25 - Red River Crops Conference - Childress, TX
24-28 - Sports Turf Managers Association Conference - Orlando, FL
January 31-Feb 2 - Texas/Oklahoma Cotton Physiology Meeting - College Station Hilton

**February**

2-3 - Soil Survey and Land Resource Workshop
7 - Watershed Stewards Workshop - New Braunfels http://tws.tamu.edu/workshops/registration/
9-11 - Plant Science Research Network - Phenomics, Tucson, AZ
10 - Flag The Technology - County Extension Agent training - WebEx
10-14 - Phenome 2017 - Tucson, AZ
11 - Aggieland Saturday
16-20 - AAAS Annual Meeting - Boston, MA
15-16 - Plant Breeding Symposium - MSC http://plantbreedingsymposium.com/home

Feb. 28 - Inventory Completion Goal

**March**

1-4 - Commodity Classic - San Antonio, TX
2 - Texas Water Well Owner Training - Tyler
3 - Texas Healthy Streams Workshop - Hempstead
4 - FFA Land/Soil/Homesite evaluation clinic - Beef Center
5-11 - Groundwater Awareness Week
7 - Flag The Technology - County Extension Agent training - WebEx
8 - Texas Watershed Stewards Workshop - Denton http://tws.tamu.edu/workshops/registration/
16-17 - Spring Break faculty/staff holidays

**Save the Date**

May 16-18 - Southern Department Heads Meeting
May 24 - Deadline for Staff Evaluations