January 2018

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Cover Photo courtesy of Dr. Katie Lewis
Happy New Year!

It is great to have many new students join us on campus and to kick things off for the rest of the school year. The winter meetings are in full swing and only disrupted a bit by cold weather. Speaking of the cold, it seems like about ½ of the heating units in Heep are now working, with the coldest snap in a decade behind us.

Congratulations to all of our recent award recipients at the Vice-Chancellor, Director and Department levels (See stories and photos inside). It is great to see our exceptional faculty, staff, students and collaborators recognized. A special thanks to Dr. Sam Feagley for leading this effort on behalf of the department for several years.

We had our annual meeting with the Deans and Directors and Vice-Chancellor this week. Below is the annual state of the department including goals and vision for the next year.

**Annual Review**

**Overall**

Excitement continues to build in the Soil and Crop Sciences Department through our Grand Challenge Efforts and focus on major activities including our UAV work, gene editing work, research to facilitate in-situ analyses of root structure and tuber yield, and our leadership in soil security. All areas have seen infusion of federal funds during the year and we are starting to see meaningful data that is proving to be transformational to Crop Science in general.

We continue national leadership through editor-in-chief posts for Crop Science Society of America, board leadership on CSSP and NAPB as President-elect and leading the international efforts on soil security.

Our Strategic Vision for the department has been a powerful guide as we continue moving forward. Our Strategic Vision is centered around recruiting outstanding faculty members to fill gaps and provide new opportunities, it also focuses on our infrastructure. With the grand opening of our turf facility this year we have had the opportunity to renew discussions with Scotts and others about major research programs. Last year the Provost offered to match funds with COALS and the Department to upgrade five of our teaching labs. Hopefully, remaining issues will be resolved and we can complete the much-needed renovation.

A special thanks to the administrative partnership that allowed for new building facilities in the Brazos bottom that will allow storage of expensive research equipment with weather sensitive electronics and sensors.

This year we completed the reclassification of Dr. Kathy Carson as an Instructional Assistant Professor to replace Dr. Harry Cralle. Dr. Julie Howe joined us this past summer to take leadership in our soil fertility work as Dr. Frank Hons retired. Dr. Scott Nolte joined us as State Extension Weed Scientist. We are currently participating in the recruitment process for the Borlaug Chair, searching for two extension turf positions and interviewing for a soil carbon position. We are developing plans with clientele groups for a new agronomist position in San Angelo.

Demographically, our faculty make up has changed dramatically over the past 10 years. We have gone from 2 to 17 female faculty and made similar progress with minority faculty. We still have opportunities to enhance our reflection of the state's population, but progress has been rapid.

**Research**

Our research program continues to grow through the addition of outstanding faculty members. While still focusing on improvements that make a difference for Texas producers, we are gradually shifting to the capacity to solve problems at the national level as recognized by the federal grants received. We have strong support from the commodity groups for our applied research programs, be it turfgrass, cotton, sorghum, wheat, peanut or rice. This year we released fourteen cultivars and germplasm lines and continue a long tradition of supplying Texas and the world with improved crop germplasm. Examples of our success,
include the recent patent application for our control of lawn water going over the curb and TAM wheat cultivars that remain the most widely grown winter wheats in the US.

We are actively engaged with Bayer and Monsanto discussing future endeavors as we transition through corporate support for bio-energy and corporate mergers. The pipeline we have developed/are developing for plant transformation, gene editing and sequencing will be transformative over the next five years (thanks).

David Stelly was named Cotton Researcher of the Year by International Cotton Advisory Committee, BB Singh was inducted as AAAS fellow, Amir Ibrahim and Ray Smith were selected as CSSA fellow. Seth Murray returned from his role as Senior Advisor of Agricultural Systems, Office of the Chief Scientist (OCS) / U.S. Dept. of Agriculture.

Teaching

Over a four-year time frame, the Department has experienced a decline in total undergraduate enrollment from a high in Fall 2015 of 168 to a Fall 2017 enrollment of 121 (Fall ’14=138, Fall ’15=168, Fall ’16=149, and Fall ‘17=121). This enrollment continues above our modern era low of 99 that occurred in 2008.

During this most recent four-year period the Department (1) implemented a curriculum revision that instituted a more rigorous set of required courses, (2) removed our “industry option” that was a less rigorous path to a degree, and (3) became more aggressive in not accepting academically at-risk students and accepting dismissals from our degrees by the Dean’s Office.

Our students continue to take advantage of high impact (HI) learning experiences and the Department’s administration and advisors continue to stress the importance of such opportunities. Twenty-seven (22%) of our UG attended and participated (Department policy) in discipline professional meetings, participated in national/regional/local judging competition, or received academic awards. Twenty-nine (24%) participated in official internships, most in Texas but also in Ohio, Nebraska, California, Illinois, and North Carolina. Two of our outstanding students have been offered internships in Turkey for the summer of 2018. A number of our students work during the summers to support their attendance at Texas A&M and we hope to transition many of these to zero hr 484.

Study Abroad HI learning opportunities are offered by SCSC with our most successful being a study abroad in Brazil led by Dr. Terry Gentry. Agriculture in the UK is offered by Dr. Jackie Peterson and Dr. Steve Hague offers one to Mexico and previously led a group to Cuba.

Graduate Student numbers are essentially unchanged over the past year with 121 on-campus graduate students. Twenty-eight (23%) of our graduate students won national/regional/local recognition in 2017.

Our PLBR graduate students initiated contact/proposal with DuPont Pioneer in 2014 and established the DuPont Pioneer Event Series Graduate Student Plant Breeding Symposium. The first event was held in February 2015, the second annual event in February 2016, third in 2017, and the fourth scheduled for February in 2018. These have been hugely successful and the students, department, TAMU, and AgriLife have received accolades from industry and university leadership nationwide. These events bring in renowned speakers from across the U.S. and attract attendees from SHUS and TTU, as well as across campus and across the nation via webinar.

Our Distance Plant Breeding Program, the only such program in the U.S., continues to do well with a total enrollment of 18 (current for Spring 2018). This distance program degree is offered by both SCSC and HORT. We initiated this program in Spring 2013 and have graduated six distance students to date: Chad Hays-PhD-sorghum breeder on TX High Plains, Laura Brown-MSNTO-watermelon breeder in California, Manuel Michel-MS-field testing agronomist with Monsanto in south Texas, Nan Yen Chou-PhD-hybrid rice breeder with CPS in upper coast of Texas, Charlotte Barnhart-MSNTO-high school teacher in LRGV, and Vishal Saitwal-PhD-corn breeder with Pioneer in India.

Concomitant with the academic distance plant breeding program, we initiated a Continuing Ed program in plant breeding. For the calendar year 2017, we delivered 118 modules of information to 62 individuals. Our largest consumer is Syngenta.

Extension

The SCSC Extension Unit is comprised of 15 Extension Specialists and 11 Program Specialists. Extension Specialists are strategically located across the state at various Research and Extension Centers and at College Station. We have experienced one retirement and two resignations from our unit this year. Current open positions are: Extension Turf Specialist – College Station, Extension Turfgrass Specialist – Dallas (interviews are being conducted), Extension Agronomist – San Angelo, State Extension Forage Specialist – College Station and our request for a position on Ag/health nexus issues.
Total Educational Contact Hours for 2017 were 77,996 and represents a very good outreach by our unit. Our major program thrusts included: soils and soil fertility, water, weed management, turf, cotton, wheat and other small grains, oilseed crops, corn, grain sorghum, forages, peanuts, soybeans, sunflowers, guar, alfalfa, rice, and others as needed. This was funded in large part by total grants & gifts of $6.2 million, of which $1.9 million came directly to the SCSC Extension Unit. As bioenergy sources of funding have diminished, SCSC Extension Unit grants have increased in the area of water quality.

Commodity board and private industry support continues to be strong, indicating good support for SCSC Extension Unit Specialists and the work they conduct benefitting Texans and beyond. Commodity prices and thus inputs utilized by producers has dramatically decreased over the past three years. While programming to help producers weather these conditions, we also program to provide background to take advantage of future opportunities through enhanced knowledge of the drivers of success.

The Texas A&M AgriLife Extension Service Texas Well Owner Network (TWON) was intensively engaged in responding to the emergency need created by Hurricane Harvey for flooded water well testing. Through collaborative efforts with partners, TWON: provided free testing for more than 1,200 water wells; delivered 47 well testing events serving 28 hurricane-impacted counties; communicated private water well best management practices, including well disinfection instructions and training; documented reduction total coliform bacteria from about 46% immediately after Hurricane Harvey to about 23% during the testing period November 16-December 13. For Escherichia coli, the reduction has been from ~12% immediately post-Harvey to 0-1% Nov 16-Dec 30.

Because of the rapid adoption of dicamba-tolerant cotton, the use of newly registered dicamba herbicides, launched in 2017, resulted in a record number (2,708) of dicamba-related injury reports filed across the U.S. as of Oct 15, 2017. Arkansas (986) and Missouri (310) reported the highest number of issues, but Texas had only 10 dicamba-related reports filed with TDA. This difference was in large part due to the effective training provided in 2016 by SCSC Extension and allied industry on the new technology and current use restrictions already in place in Texas. 2018 label changes, mandated by EPA to reduce off-target movement, have major revisions, including mandatory annual applicator training. AgriLife Extension rapidly developed training through collaboration with allied industry that met EPA and TDA requirements. This training has been shared with many other states and reciprocity has already been established with Oklahoma and is currently in process with New Mexico.

You can support Soil and Crop Sciences research, teaching and extension outreach with your tax-deductible donations.

More Information can be found on our website: http://soilcrop.tamu.edu/giving/

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**Soil and Crop Sciences hosts international visitors**

A team from Azerbaijan recently visited the Soil and Crop Sciences and Entomology departments to discuss future strategies for participation in cotton research, cotton training, building teaching infrastructure and building a research pipeline.

Pictured are Dr. David Ragsdale, Department Head - Entomology; Dr. David Baltensperger, Department Head - Soil and Crop Sciences; and Pavel Belorusskiy and Teymur Tagiyev of the Azerbaijan Agriculture Training and Development Center.
Dr. Amir Ibrahim, Texas A&M AgriLife Research wheat breeder in the Texas A&M University department of soil and crop sciences in College Station, was honored with the agency’s Faculty Fellow award Jan. 9 in College Station. This is AgriLife’s highest honor.

“Amir is recognized for his leadership in wheat research programs both here in the U.S. and worldwide,” said Dr. David Baltensperger, head of the Texas A&M soil and crop sciences department in College Station. “In addition to his international research, his graduate research program is producing the wheat breeders for the next generation.”

Ibrahim leads the Texas A&M small grains breeding program, managing wheat cultivar development for the agency’s South, Central and Northeast regions of the state, Baltensperger said.

He has released or co-released 18 wheat and three oat cultivars with high yield potential, excellent quality and tolerance to biotic and abiotic stresses, according to his nomination. Eleven of his 21 releases and co-releases had viable seed production in 2016, covering over 1 million acres in five states.

Ibrahim is known for his applied research on genetic control of end-use quality and biotic and abiotic stress tolerance in wheat, as well as his continuing research of hybrid wheat, Baltensperger said. His most recent release, TAM 305 hard red winter wheat, was highlighted in Crop Science Association News for its superior resistance to disease.

“This cultivar is in demand by wheat breeders throughout the world to use in their breeding programs,” Baltensperger said.

Another significant impact is his management and leadership of the Uniform Disease Nursery at Castroville, the nomination stated. The nursery serves the wheat breeding community, both public and private, in ensuring wheat cultivars available to U.S. producers are resistant to the latest biotypes of wheat leaf, stripe and stem rusts as well as oat crown and stem rusts.

Thirty-three hard red winter and hard white wheat released cultivars from 11 programs in the U.S. went through testing at the nursery during the past five years.

Ibrahim has obtained almost $3 million to fund his research program during the past five years, according to the nomination. He has been active in presenting his research findings, publishing 90 refereed journal articles, 36 Extension papers, 11 technical reports, two book chapters, and 98 abstracts and proceedings.

“The effectiveness and quality of Dr. Ibrahim’s scholarly activities are seen in his growing influence in the international arena that includes collaborative efforts with the Texas A&M Borlaug Institute as well as within his research expertise in wheat breeding and genetics,” Baltensperger said.

According to the nomination, Ibrahim is in demand as an international expert in areas such as Mexico, northern Africa, Western Asia, Central Asia and Eastern Europe. He continues to be committed to dissemination of knowledge and the relief of poverty and hunger through improved agriculture via his formal and informal educational efforts.

Ibrahim’s latest project in the Republic of Georgia increased grain yield of wheat to 4.5 tons per hectare from the country’s average of 1.5 ton per hectare by addressing soil issues and using improved agronomic practices and germplasm.

During the past five years, Ibrahim graduated 11 doctoral and nine master’s students, most of whom hold key positions in other universities, the U.S. Department of Agriculture-Agricultural Research Service and private sector.

Ibrahim was recognized recently as the title of Fellow by the Crop Sciences Society of America, and has received numerous other awards.

He currently serves as a member of Texas A&M Plant Release Committee, Texas Small Grains Advisory Committee and chair of the AgriGenomics Laboratory Advisory Committee. He also has served as associate editor of the Journal of Plant Registrations and Journal of Crop Improvement; and is director of the Multi-state Wheat and Oat Rust Evaluation Nursery.

Ibrahim is a member of the Crop Science Society of America, American Society of Agronomy and Sigma Xi Honor Society.
Dr. Qingwu Xue, Texas A&M AgriLife Research crop stress physiologist in Amarillo, was honored with the agency’s Faculty Fellow award Jan. 9 in College Station. This is AgriLife’s highest honor.

“Dr. Xue’s peers respect him as a capable scientist, a valuable team player and a ‘people person,’” said Dr. Brent Auvermann, Texas A&M AgriLife Research and Extension Center director in Amarillo in his nomination.

Xue’s research focus has been on crop physiology, abiotic stress, drought tolerance and water management strategies for major crops in the Texas High Plains – corn, wheat, sorghum, cotton, potato – and more recently vegetables.

“His research has had a significant impact on crop management, identifying the structural reasons some plant varieties can withstand heat or disease stress so much better than other varieties,” Auvermann said. “Some plants have brilliant defense mechanisms, and Dr. Xue’s research helps us know how they defend themselves and what we need to look for in our breeding programs.”

Scientifically, his research can help breeders, geneticists, agronomists and irrigation engineers develop better varieties and management strategies to increase crop yield and water-use efficiency, his nomination stated. Practically, his research directly relates to producers’ bottom line, the rural economy, natural resources use efficiency and environmental health.

For example, Xue’s research showed new drought-tolerant corn hybrids can achieve high yield under reduced irrigation conditions. Field studies indicate it is possible to maintain 200 bushels per acre of yield at an irrigation level of 75 percent evapotranspiration requirement with some new hybrids. This level can allow irrigation water savings of over 20 percent, or 5 inches.

A reduction of irrigation just 1 inch/acre/year in North Texas High Plains corn acreage would result in a total water savings of nearly 13 billion gallons, according to the nomination.

Developing drought-tolerant wheat cultivars is a critical strategy for wheat management under water-limited conditions, the nomination stated. Xue’s studies indicate selecting cultivars with higher biomass and greater early vigor may be beneficial to wheat management in the area.

His team found cultivars such as TAM 111 and TAM 112 can use soil water more efficiently, which is important for producers to better manage wheat under dryland and limited-irrigation conditions. With multiyear field studies, Xue identified plant traits related to drought tolerance, which can be used by breeders to develop drought-tolerant wheat cultivars and geneticists to screen molecular markers and speed the breeding process.

Xue has also studied wheat streak mosaic virus infestation, WSMV, and determined the disease can reduce biomass and yield as late as the boot stage. WSMV reduces root growth, thus limiting the plant’s ability to extract soil water and potentially decreasing water-use efficiency.

Xue’s recent research on high-throughput field phenotyping has been significant for researchers and producers, the nomination stated. His program evaluated remote sensing tools at both ground and aerial levels to characterize wheat and corn genotypes for drought tolerance. These tools can be used to provide management information for producers within a short period of time, potentially increasing field management efficiency and reducing production costs.

Xue also worked with sorghum, conducting multiyear field studies and evaluating the feasibility of high biomass sorghum hybrids under different soil water regimes. He determined limited irrigation may be more attractive for sustaining higher biomass yield and supplies given the large variation of seasonal rainfall in the Texas High Plains.

He is a nationally and internationally recognized scientist with significant invited presentations. In the past five years, he has made 28 invited presentations of which eight were international. In particular, he joined a Texas A&M team and traveled to Tunisia for a U.S.-Tunisia linkage program workshop supported by the U.S. State Department.
Daniel Hathcoat, Texas A&M AgriLife Extension Service small grains and oilseeds program specialist in College Station, has been recognized with a Superior Service award in the program specialist, manager or coordinator category by the agency.

The annual Superior Service awards, presented Jan. 9 in Bryan, recognize AgriLife Extension personnel who provide outstanding performance in education or other outstanding service to the organization and Texans. It is the highest award given by AgriLife Extension.

Hathcoat’s nomination cited his work in obtaining and preparing seed for trials, maintaining plots and supervising data collection for numerous agronomic studies conducted throughout the state.

The extensive statewide uniform wheat variety trial conducted each year heavily relies on Hathcoat’s leadership to coordinate with seven other research programs in order to plant 30 locations over the course of three months, wrote Dr. Clark Neely, AgriLife Extension state small grains and oilseed specialist, College Station.

“In the past, Daniel collected seed from numerous seed sources around the country and distributed that seed for planting in nine of the 12 AgriLife Extension districts in Texas, in addition to overseeing the day-to-day maintenance and harvest of five of the 30 trials,” Neely said in his nomination. Hathcoat’s contributions have made a direct impact on other AgriLife Extension programs also, Neely said, including forage, weed and soil fertility programs in order to help expand their capacities through planting and harvesting plots, repairing equipment or mentoring other program specialists.

In addition to variety testing, the Small Grains and Oilseeds Program continues to expand its scope of research projects, Neely said. That requires Hathcoat to plant, maintain and harvest over 40 additional trials spread across 11 locations statewide.

These agronomic trials evaluate a variety of products and management practices, including fertility, fungicide, insecticide, herbicide, planting date, crop rotation and plant growth regulators on small grains forage, wheat, oat, barley, canola and soybeans, Neely said, adding Hathcoat’s actions demonstrate the diversity of his abilities and time management skills.

“Daniel has the ability to get a lot done in a short amount of time, which in my opinion increases the capacity of the Small Grain and Oilseeds Extension Program by 25 percent or more, including the number of educational programs attended and number of trials conducted,” Neely said.

Hathcoat routinely speaks at producer meetings and field days, of which there have been 16 since 2013, and has co-authored five scientific journal articles, 17 AgriLife Extension publications, 13 county AgriLife Extension reports and 23 scientific abstracts over the past five years as the small grains and oilseeds program specialist.

Congratulations to Kirby Peddicord Young for being selected to receive the Texas Water Resources Institute (TWRI) Mills Scholarship for 2018.

Her research project studying the biogeochemistry of urban, suburban and rural ponds and lakes in south-central Texas is one of six the TWRI selected out of the 40 proposals received.

Kirby is working on her Master of Science in Water Management & Hydrological Science under Dr. Jacqui Peterson.
Ramirez recognized with AgriLife Extension Superior Service Award

By: Kay Ledbetter

Jonathan Ramirez, a Texas A&M AgriLife Extension Service associate at Vernon, has been recognized with a Superior Service award in program support by the agency.

The annual Superior Service awards, presented Jan. 9 in Bryan, recognize AgriLife Extension personnel who provide outstanding performance in education or other outstanding service to the organization and Texans.

Ramirez joined AgriLife Extension in 2011. His nomination cited his organization of numerous agency activities, including 74 applied research trials and 48 demonstration plots.

AgriLife Extension’s Rolling Plains agronomy program and county agents together conducted five wheat field days during spring 2017 at wheat demonstration plots organized by Ramirez, said Dr. Emi Kimura, AgriLife Extension agronomist, Vernon.

A total of 140 wheat producers attended field days, she said. The economic impact to the region was estimated at $790,776, as wheat producers can potentially improve grain yield through attending these educational opportunities and applying what they learn.

As a key member of the AgriLife Extension cotton team in the Rolling Plains, Ramirez also conducted over 30 variety trials throughout the region, and was instrumental in coordinating experiments evaluating the use of the fungicide Topguard for management of cotton root rot, Kimura said.

He also modified and designed pieces of equipment that increased the ability and efficiency to conduct on-farm trials, she said.

Dale Dunlap, AgriLife Extension district administrator at Vernon, said, “Jonathan’s strong work ethic has caused him to be highly regarded by several AgriLife Extension county agents in District 3, specifically for his enthusiasm, practical skills and ability to get things done and communicate with growers and other personnel within the farming industry.”

Ramirez participates in annual in-field AgriLife Extension county agent cotton training in District 3, where he prepares herbicide injury plots to simulate herbicide drift issues for cotton producers in the Rolling Plains, Dunlap said. He also demonstrates application of back-pack sprayers and the differences among nozzles during the training.

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Ramirez participates in professional development opportunities by attending and submitting abstracts and proceedings to Beltwide Cotton Conferences since 2012, Kimura said.

“Jonathan has proven to be a dedicated worker willing to go the extra mile to complete the job at hand,” said Dr. Paul DeLaune, Texas A&M AgriLife Research environmental soil scientist in Vernon. “He is very accommodating and brings a lot of real-world knowledge to the table. As a result, he is highly respected by fellow AgriLife Extension and Research co-workers, industry partners and perhaps most importantly, producers.”

Plant Breeding Grad Student Recognized

Mitchell Schumann received the Graduate Student Award from the National Council of Commercial Plant Breeders during the American Seed Trade Association Corn & Sorghum and Soybean Conference in December.

Mitchell is working on his Ph.D. in plant breeding under the supervision of Dr. Wayne Smith. His research is focused on improving fiber quality through genomic selection.

Mitchell also received first place in the Graduate Student competition at the Beltwide Cotton Conference in San Antonio in early January.
The Texas A&M AgriLife Extension Service has recognized a cotton and weed team with a Superior Service Team Award for their efforts on educating producers on auxin-tolerant cotton weed control systems.

The annual Superior Service awards, presented Jan. 9 in Bryan, recognize AgriLife Extension personnel who provide outstanding performance in education or other service to the organization and Texans.

The AgriLife Extension team members recognized were Dr. Seth Byrd, cotton specialist, Lubbock; Dr. Josh McGinty, agronomist, Corpus Christi; Dr. Gaylon Morgan, state cotton specialist, College Station; Dr. Peter Dotray, weed scientist, Lubbock; and Dr. Mark Matocha, environmental safety specialist, College Station.

In response to the expected release of new cotton herbicide technologies, AgriLife Extension cotton and weed science personnel worked with state and federal agencies to encourage a balanced approach based on scientific data for the introduction of the new formulations and associated application restrictions, according to the nomination.

The team worked with the local and state commodity organizations, allied industry professionals, Texas Department of Agriculture, Texas A&M AgriLife Research and Texas Plant Protection Association to develop, implement and promote good stewardship of these new herbicides, including the Flag-the-Technology approach to decrease the potential for misapplications of herbicides to susceptible crops.

“The potential damage to neighboring crops could have been in the millions of dollars and resulted in many other legal ramifications, as noted in other states,” the nomination stated. “However, to date, the benefits of the cotton producers having a tool for managing problematic weeds far outweigh any detrimental impacts from these technologies, and have increased economic returns to growers in 2017, and into the near future.”

“As a cotton producer organization serving 41 counties where growers usually produce about two-thirds of the state’s cotton crop, we appreciate this team for directly meeting the needs of our growers,” said Steve Verett, Cotton Inc. executive vice president in Lubbock, in a letter of support.

“They have done a magnificent job helping our growers, consultants and other industry leaders navigate through the challenges and opportunities created by the adoption of these new technologies.”

In recognizing this team’s actions, the nomination stated that as of mid-August, 1,439 official dicamba-related injury complaints had been received by various state departments of agriculture across 10 Cotton Belt states. However, only 10 complaints related to either 2,4-D or dicamba were filed in Texas, home to over 55 percent of the U.S. cotton acreage in 2017.

“While this is undoubtedly a reflection of Texas producers stewarding these new herbicide technologies and making good decisions, it is also a reflection of the tireless educational outreach efforts put forth by this team,” the nomination stated. “Their efforts ensured producers and allied industry representatives in the state received up-to-date information and training on restrictions and regulations associated with the technologies.”

Team members worked closely with allied industry, grower organizations and the Texas Department of Agriculture to conduct and demonstrate the pros and cons of the new technologies, fill data gaps for Texas through small plot research trials and to ensure growers were receiving a unified message on the do’s and don'ts when applying the new formulations, according to the nomination.

In order to broaden the educational base of unbiased information, this team conducted seven internal trainings for AgriLife Extension county agents, integrated pest management agents and other specialists.

As a result, more than 100 AgriLife Extension personnel received instruction in label requirements and application guidelines, herbicide traits and the specifics of off-target movement and conditions that influence drift and volatility. This information was then dispersed to growers through the county agents.
Congratulations
to our Departmental Awards Recipients!

B.B. Singh Award for Outstanding Achievement
Non-academic Support Staff
Dawn Deno

Administrative Support Award
Barbara Childress

County Extension Agent Award
Roy Walston (Kerr County)

Graduate Student Research Award
Prabhu Govindasamy

Graduate Student Teaching Award
Sarah Vaughan

Research Faculty Award
Dr. Seth Murray
Departmental Award Winners Continued

Research Support Award
Jacob Pekar

Undergraduate Student Support
Savanna Shelnutt

Teaching Award
Dr. Amir Ibrahim

Technical Staff Support - Lab
Jeff Waskom

Award winners unable to attend reception were:

Vishal M. Saitwal - B.B. Singh Award for Outstanding Thesis Research in Crop Sciences

Ronnie Schnell - Extension Faculty Award

Sushil Thapa - Research Collaboration Award

Brad Roeder (Gillespie County) - Collaborating County Extension Agent Award

Special Service
Texas Rice Research Foundation (TRRF) represented by Mr. Anderson
A first-of-its-kind zoysia grass hybrid promises superior putting green performance and quality while requiring fewer inputs compared to other warm-season turfgrasses on the market, said Dr. Ambika Chandra, Texas A&M AgriLife Research turfgrass breeding program leader in Dallas.

The new variety, tested as DALZ 1308, produced average roll distances above 9 feet in industry standard roll-distance research trials. Golf courses now testing the new zoysia report averages of 12 feet — an ideal roll for tournament play by golf industry standards between 9 feet and 13 feet, Chandra said.

“This is a next generation, ultra-dwarf, super-fine textured, greens-type zoysia grass,” she said. “It’s genetically dark green with high shoot density, which produces a superior quality putting surface.”

Zoysias, compared to other warm-season turfgrasses, generally produce higher quality turf with fewer inputs like mowing, nutrients and chemicals due to their natural tolerance to disease, insects, shade and salinity stress, Chandra said. Their comparative low maintenance could help higher-quality putting greens become viable and sustainable for golf courses with limited budgets and human resources.

“The problem with putting green zoysias historically is that they’re known to roll too slow for tournament play,” she said. “DALZ 1308 solves that.”

The exclusive national license for production and sale of the variety is held by Bladerunner Farms of Poteet, which is working to establish fields of the new turf. The company will grant sub-licenses to select producers across the U.S.

“I believe that the use of zoysias for greens will prove to be the next big thing in golf and that 1308 will lead the way,” said Bladerunner Farms owner David Douget.

DALZ 1308 also represents a scientific breakthrough in its standing as the first hybrid developed specifically for putting greens by crossing two different turfgrass species, zoysia minima and zoysia matrella. According to Chandra, the minima x matrella cross which resulted in Dalz1308 was originally made in 2003.

“That just goes to show that plant breeding is a long-term process,” she said.

Several hybrids were developed and three full-sibs were entered in the national turfgrass evaluation program (NTEP) in 2013 for nation-wide evaluation.

“In the NTEP, 1308 stood out in performance and quality,” Chandra said. “We are certainly excited about the release!”

Another unique factor in this cross is that the AgriLife Research turfgrass breeding program is one of the only programs in the country with access to minima germplasm.

Chandra will discuss the genetics, development, evaluation and performance of greens-type zoysia grasses at Bladerunner Farms on Feb. 6 – part of the Golf Industry Show in San Antonio.

“We believe we’re going to see an increased use in zoysias for putting greens across the country with the release of DALZ 1308,” she said. Go to https://dallas.tamu.edu/research/turf/ and contact Chandra for more information on DALZ 1308. Contact Doguet by going to http://www.bladerunnerfarms.com for information on sub-licensing the variety.
Students, soil fertility and nutrient management in Texas and beyond have been major parts of Dr. Sam Feagley’s life for many years, and all are areas where he hopes he has “made a difference.”

Feagley, the Texas A&M AgriLife Extension Service state soil environmental specialist in College Station, will walk away from his soil-testing equipment and his professor’s place at the front of the class when he retires Dec. 31 after more than 22 years at Texas A&M University.

He is known nationally and internationally for his research in nutrient management from organic and inorganic nutrient applications, land reclamation of surface-mined lands, saline/sodic soil remediation and revision of the Texas Phosphorus Index.

Feagley said his career has been a dream come true.

“Dr. Murray Milford taught basic soil science at Texas A&M and was the best professor I ever had,” he said. “I thought once during class, I want to be a teacher some day and if I can be almost as good as him, I’d be a success. And if I could come back to A&M, what a dream come true. I did finally make it back to the basic soil science classroom 32 years later.”

He joined the Texas A&M soil and crop sciences department in 1995. With nine soil scientists retiring from 1999 to 2011, Feagley eventually moved from 100 percent AgriLife Extension to 75 percent teaching and 25 percent AgriLife Extension, taking on teaching responsibilities for Soil Science, Reclamation of Drastically Altered Lands, and a study abroad class to Brazil, Brazilian Agriculture and Food Production Systems.

“Dr. Feagley has carried on a long tradition of excellence in our introductory soil science class,” said Dr. David Baltensperger, head of the Texas A&M department of soil and crop sciences.

Dr. Larry Redmon, soil and crop sciences associate department head and AgriLife Extension program leader in College Station, added, “Dr. Feagley is one of the most respected instructors in the department of soil and crop sciences.”

Feagley has taught more than 3,000 students over the years, and his connection with many continued after graduation. He was known for helping former students obtain a job with an environmental firm and/or helping them when working with state and federal guidelines, rules and regulations.

But the department leaders say it is Feagley’s contributions beyond the classroom that have earned him wide acclaim.

“Sam has provided exceptional leadership in facilitating science-based environmental regulations,” Baltensperger said. “His leadership in mine reclamation programs has been of tremendous value to the industry.”

And he has been the AgriLife Extension go-to resource regarding the environmental management of soils, Redmon said.

“I guess in working with environmental soil remediation over the years, the greatest satisfaction came when we were able to show regulators we were not recommending things that were biased, and they were accepting of our advice,” Feagley said. “We’ve been able to get some regulations changed. Those are where you look back and say ‘We made a difference.’”

Examples he gave from Louisiana included working with the rice industry to show many of their management practices were actually improving the water quality in the drainage water-receiving bayous, which helped ease some regulations being imposed on growers. Most producers accepted and implemented changes that improved the water quality.

He also worked with the lignite mining industry in Louisiana on their reclamation process using topsoil substitutes that actually improved productivity of the land better than native soils. This was shown by other researchers in Texas as well.

“‘It’s changed the regulations and allowed the mining companies a little more flexibility as to how they reconstruct the topsoil,’’” Feagley said.

Also in Louisiana, he said they continued next page
demonstrated that a declining swamp could be used for the tertiary treatment of municipal effluent and actually increase the productivity of the swamp and renew it at the same time as the remediation of nutrients from the effluent.

When he moved to Texas and began working with the lignite mining industry here, Feagley said he helped with a workshop to train science teachers about the chemistry of the soils, the overburden and how the environment is put back together after a tremendous disturbance.

“It’s very difficult to tell what has been mined and what hasn’t been mined, and seeing that light bulb go off when the teachers are viewing the land is always rewarding,” he said.

But Feagley said he probably spent the most time looking at phosphorus in applied manures from the animal feeding industry and revising the Texas Phosphorus Index for adding nutrients to the soil.

“Through that research, both the U.S. Department of Agriculture/Natural Resources Conservation Service and the Texas Commission on Environmental Quality have accepted our methods of analysis and recommendations for phosphorus,” he said.

“Before our research, there were three different methods of extraction and two methods of analysis for phosphorus. We were able to change that to one extraction and method of analysis, taking a lot of the variability out of the analysis TCEQ was seeing on the permitted fields.”

Feagley said he also worked with NRCS to develop a course to certify Texas nutrient management specialists. The Environmental Protection Agency and USDA in 1999 required each state to develop certification for specialists for animal feeding operations.

“We in the Texas A&M soil and crop sciences department got together with NRCS personnel and worked on soil fertility, testing, and rules and regulations,” he said. “We developed a 20-hour course, which is still being taught. Texas was the first state to implement the course and several others patterned their state programs after ours.”

Feagley authored over 50 peer-reviewed publications and has taught almost 15,000 people over the years through his AgriLife Extension county, Master Gardener and Master Naturalist programming.

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“He earned his bachelor’s and master’s degrees from Texas A&M and his doctorate from the University of Missouri. From there he went to Louisiana State University where he had a teaching and research position for 16 years.

While there, he was instrumental in the request for and development of the college level curricula, Environmental Management Systems or EMS, and became the adviser for these students. EMS was designed to focus students on soil, water or air environmental areas. The soil and water areas had more science and lab hours than the basic science degrees at LSU. When he left LSU, he was advising over 200 students in EMS.

Feagley has been awarded numerous teaching awards from LSU and Texas A&M. At LSU he received the Outstanding Professor in Agronomy, Agriculture Students Association Outstanding Undergraduate Teaching in the College of Agriculture, Joe E. Sedberry Outstanding Undergraduate Teaching Award in the College of Agriculture, and Student Government Outstanding Teacher in the College of Agriculture.

Feagley continued
Research Team aims to develop instrumentation to view intact soil-root systems

Texas A&M Soil and Crop Sciences professor Dr. Cristine Morgan has teamed up with Dr. Matthew Rosen of MGH/Martinos Center for Biomedical Imaging in Boston, Massachusetts, and personnel from Texas A&M AgriLife Research, The National Institute of Standards and Technology (NIST) and ABQMR to develop low field magnetic resonance imaging (LF-MRI) instrumentation capable of imaging intact soil-root systems.

“Currently there are no techniques to non-invasively observe intact soil systems, and non-destructively image root architecture and development, and transport processes such as water movement or storage between and through soil aggregates,” said Morgan. “We hope to develop an instrument with these capabilities.”

A field-deployable, low-frequency magnetic resonance imaging rhizotron would lead to fundamental gains in understanding the root-water-soil interactions that drive processes such as nutrient uptake by crops, water use and carbon sequestration, according to the researchers. The LF-MRI system will be integral in the development of an ideotype and a field breeding program for sorghum.

“We propose to genetically design sorghum with a root ideotype that combines the traits/properties identified to optimize carbon sequestration and efficient use of water and nitrogen,” Morgan said. “Our proposal specifically addresses the goals of the ROOTS program by enhancing genetic selection of bioenergy sorghum root systems that have higher biomass, are more deeply deployed and efficiently mine soil water and nitrogen, thereby improving biomass yield and energy production.”

The LF-MRI rhizotron is expected to provide an immediate and direct innovation through plant genomics and breeding applications.

The project is being funded through a grant from the U.S. Department of Energy’s Advanced Research Projects Agency-Energy (ARPA-E).
A recent study led Texas A&M AgriLife Research has shown ground-penetrating radar, or GPR, may be effectively used in detecting the fine roots of plants, helping agricultural producers identify what crop varieties are best suited to their field conditions.

Dong said his knowledge this was the first study showing the high potential for using GPR to detect fine roots in agricultural crops.

The study, titled “Ground-penetrating radar (GPR) detects fine roots of agricultural crops in the field,” also involved additional researchers from the Uvalde center, Texas A&M AgriLife centers in Amarillo and Weslaco, the U.S. Department of Agriculture Forest Service and the Samuel Roberts Noble Foundation in Ardmore, Oklahoma.

It was conducted at four Texas cities — Amarillo, Dilley, Uvalde and Weslaco — with different soil types and soil moisture conditions.

“Positive fine-root development is necessary for plants to maximize their intake of water and nutrients,” said Dr. Daniel Leskovar, Uvalde center director and one of study researchers. “Being able to use ground-penetrating radar to evaluate and assess the fine root structure of different crop varieties would give us another powerful weapon in our arsenal for plant selection and breeding.”

The study provided a comparison of core-measured and GPR-estimated root parameters depicting the most significant relations for wheat cultivars, studied in Amarillo and Uvalde, and sugarcane cultivars, studied in Weslaco. Several cultivars of winter wheat and sugarcane were scanned with ground-penetrating radar at 1,600 megahertz.

Soil cores were collected immediately after scanning and the core samples containing roots were stored in a freezer until processing. The roots were then cleaned and scanned on a flatbed scanner where root diameter was analyzed. After scanning, roots were oven-dried until constant mass and root dry mass was recorded.

“To better compare the GPR signal against the measured root values from the soil cores, radar profiles were sectioned with the most signal concentrated on the upper soil layer for further analysis,” Dong said. “We also looked at pixel intensity in comparison to the different GPR indices.”

Dong said the results of the study showed significant relationships between root traits and GPR signals.

“Significant relationships were found and the accuracy of root detection was higher in wet clay soils than in dry sandy soils,” he said. “We also found that average GPR pixel intensity without an intensity threshold may be better to reflect root information.”

Most importantly, he said, the study showed both fine root diameter and biomass could be detected by ground-penetrating radar, depending on soil conditions.

“This means we may be able to use GPR to more quickly determine the suitability of various cultivars in different soil conditions so we can assess which ones might be the best to plant under those conditions to help ensure the most positive crop yield and quality.”
Barley may soon be planted to more grazing acres as Texas A&M AgriLife continues to research alternatives for the cattle and dairy industries in Texas. Barley grain is commonly used in other parts of the U.S. for malting and as a feed source for animals. But Dr. Clark Neely, Texas A&M AgriLife Extension Service state small grains and oilseed specialist in College Station, said it is a suitable forage crop for grazing and silage that offers some advantages over other cool-season forages.

“Forage variety trials around the state indicate barley is very competitive with other small grains for yield potential,” Neely said. “We are currently screening Oregon State University breeding material under several Texas environments to identify the best adapted lines for future co-varietal release.”

During the initial year of screening in 2014, Neely and his team evaluated 800-plus barley lines. These were reduced to 150 lines based on characteristics such as disease resistance, vernalization requirements and grain production, he said.

During the 2016 and 2017 seasons, Neely’s team planted 116 winter and facultative – can be planted in the winter or spring – barley lines from the Triticeae Coordinated Agricultural Project in replicated plots at College Station, McGregor, Comanche, Brady and Dimmitt to further identify high yielding lines superior to commercially available varieties in Texas for forage production.

Winter barley follows a similar growing season to winter wheat, planting in mid to late fall and harvesting in the spring for forage, though some producers suggest planting barley later than wheat in the fall in the High Plains if grown for silage. The breeding lines being evaluated for fall forage and silage production are winter and facultative types.

The silage trials consisted of 5 feet by 15 feet plots. During the growing season, plot heights and row clippings were taken per plot at the Brady and Dimmitt locations to validate normalized difference vegetation index or NDVI readings taken using the Trimble Greenseeker Handheld Sensor.

“These measurements help us estimate the relative differences in experimental lines for fall forage production,” Neely said.

Ibrahim said the NDVI readings are part of a remote-sensing approach to utilize ground- and aerial-based measurements to evaluate the barley lines for forage potential and reaction to crop stresses and maximize phenotyping efficiency.

The top early season forage and silage producing lines were identified for each environment, Neely said. There were no barley lines ranked in the top five entries at all locations for either forage or silage yield.

“We might find it difficult to select a single line for statewide adaptation or for both grazing and silage,” Neely said, but added these trials will help identify varieties that work best in different regions of the state.

Barley lines at Comanche produced dry matter yields in excess of 6.7 tons per acre and were superior to both wheat and commercial barley varieties, he said, which supports future varietal release.

Neely said the top performing barley lines were entered into the statewide forage trials this year for further evaluation.
first and then match the transgenic technology with the highest pest management priority second.

The AgriLife Extension cotton agronomy team of Morgan, Dr. Josh McGinty, agronomist in Corpus Christi; Dale Mott, program specialist in College Station; along with technicians and county agents have been conducting large-plot, on-farm, replicated variety trials for 12 years in the Lower Rio Grande Valley, Blacklands, South Texas/Wintergarden and Upper Coastal regions.

He said 17 RACE trials and three Monster Trials were planted in 2017. The Monster cotton variety trials are conducted by McGinty as small-plot variety evaluations and include a larger number of both commercially available and experimental cotton varieties.

The results of all trials and contact information are available at http://Cotton.tamu.edu. Results include yield, fiber quality and estimated lint value for each location, as well as rankings based upon lint yield for the varieties within a production region.

“Yields across the Lower Rio Grande Valley and Coastal Bend were very good this season, with good early season moisture and some timely rains during the season,” Morgan said. “Also, favorable weather at harvest helped maintain yields, unlike in the Central and Upper Gulf Coast and Southern Blacklands where some received heavy rainfall as harvest approached.

“In the Upper Gulf Coast, higher-than-average yields were expected, but yield and fiber quality were significantly impacted by Hurricane Harvey. In the Southern Blacklands, low yields were primarily due to erratic rainfall during late-season, but Hurricane Harvey negatively impacted harvestable lint and fiber quality as well.”

Morgan said prior to making landfall, Hurricane Harvey caused various degrees of damage to the Coastal Bend cotton crop as a result of wind, rain and floodwaters.

“Cotton harvest was wrapping up in the lower Coastal Bend, but was in full swing further north along the middle and upper Coastal Bend regions of the state,” he said. “Cotton losses varied greatly across several regions due to damaged/destroyed modules of cotton, floodwaters that soaked modules, and excess wind, rain and floodwaters on cotton yet to be harvested. The areas to the west and north of where Harvey hit were impacted to a lesser extent.”

The average non-irrigated yields for the 2017 RACE trials ranged from 1,981 pounds per acre for Nueces County to 761 pounds per acre for the Williamson County location. Average irrigated location yields ranged from 2,369 pounds per acre for the Medina County location to 753 pounds per acre for the Burleson County location, where Hurricane Harvey also impacted yields.

Morgan said when selecting cotton varieties, several key factors should be considered before planting.

“Producers need to gather as much unbiased yield and fiber quality data as possible from their area and beyond,” he said. “Some varieties are widely adapted, while others perform well under more specific growing conditions and situations.”

Also, Morgan said, select the herbicide- and insect-tolerant traits that best fit the expected challenges for 2018.

“Seed and technologies fees for the newer herbicide and insect traits are usually more expensive,” he said. “If you don’t need these traits, then many varieties with older trait packages are still competitive in yield and quality.”
Congratulations to Daniel and Erica Hathcoat on the new addition to their family! Daniel is an extension program specialist in the variety testing program.

Students Recognized at Beltwide Cotton Conference

Several of our students traveled to San Antonio in early January for the Beltwide Cotton Conference.

In the Ph.D. student oral presentation competition, Dorothy Menefee with her presentation titled “Modeling Evapotranspiration using DSSAT and Eddy Covariance Measurements in Texas Cotton”. Dorothy is supervised by Dr. Nithya Rajan.

James Griffin received 2nd place in the Ph.D. poster contest for the Agronomy and Soils session. James is working toward his Ph.D. in Agronomy under the supervision of Dr. Gaylon Morgan.

Mitchell Schumann, a Ph.D. plant breeding student under the supervision of Dr. Wayne Smith took first place in the Graduate Student competition at the cotton improvement meeting.

Turfgrass Students receive Scholarships

Three undergraduate Aggie turfgrass science students were recently awarded scholarships from national organizations.

Kaitlin Tanner and Calvin Wilson, both juniors, were awarded scholarships from the Trans-Mississippi Golf Association, one of the oldest and most prestigious golf organizations in the United States. Established in 1901, the TMGA is composed of more than 200 member clubs throughout the country.

Kirstin Burnett, a senior double major AnSci and TGSC, received another Sports Turf Managers Association scholarship.

Calvin Wilson, one of two Aggies to receive TMGA scholarships
Concerns

Please keep Delroy Collins in your thoughts and prayers as he recovers from his recent surgery. Delroy is a Senior Research Associate in the sorghum breeding lab.

Calendar

January
17 - Certified Nutrient Manager workshop - Mont Belvieu - contact Michael Kuitu mkuitu@tamu.edu
26 - Texas Watershed Stewards - Brenham more info at: http://tws.tamu.edu
26 - Certified Nutrient Manager workshop - Brenham - contact Michael Kuitu mkuitu@tamu.edu
31 - Small Grains Advisory Committee - contact Clark Neely cbneely@tamu.edu

February
1-2 - Soil Survey and Land Resources Workshop - College Station - contact cmorgan@tamu.edu
5-6 - Texas Seed Trade Association meeting - San Antonio
7 - Texas/Oklahoma cotton meeting - Lubbock
14 - Visitors from Uzbekistan
14–17 - Phenome 2018, Tuscon Arizona
15 - Certified Nutrient Manager workshop - Palacios - contact Michael Kuitu - mkuitu@tamu.edu
15-19 - American Association for the Advancement of Science Annual Meeting - Austin, TX
15 - High Plains Elevator Workshop - Amarillo
27 - Homeowner Septic System Maintenance class - Seguin contact: Ward Ling - wling@tamu.edu

March
7 - Texas Watershed Stewards workshop - College Station
12-16 - Spring Break for students
14-16 - Staff spring break

Save the Date
April 2-6 - Ranch Management University - College Station
April 26-27 - Hill Country Land Stewardship Conference - Kerrville
May 1-2 - 2018 McFadden Symposium - Brookings, SD
May 3-4 - First Bennett Trust Land Stewardship Conference - San Angelo