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- Hemp Variety Trials to Start
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On the cover:
Marla Garza celebrates earning her Bachelor’s degree in Plant and Environmental Soil Science. She will celebrate the birth of her first child in the near future.
A huge thanks to the Soil and Crop Sciences Department faculty, staff and students for adjusting to the Covid crisis and making things work. The Aggie Spirit is alive and well. We adjusted everything from in class to remote instruction, working in the field while maintaining social distance and delivering our outreach electronically. It has been amazing to be a part of the adjustment.

We will be graduating the class of 2020, and a handful of advanced degree candidates this week. Congratulations to you all! You will continue to learn and grow as you add experience to the knowledge, leadership, character and life long-learning skills you have gained during your time as a student. While graduation, ring ceremonies, scholarship banquets, and awards presentations have all been adjusted from the routine, it is the resilience that you have developed that assures us of your success as you venture forth to the next step in your careers.

Most national conferences have been canceled or gone to on-line formats. I was able to participate in the Council of Scientific Society Presidents this past week end in their on-line meeting. It is amazing how much we can do with the Zoom platform and others. We also presented the CAST Communications award in Washington D.C. through an on-line format.

Markets for our producers continue to face disruption due to Covid. Parts of the state are still abnormally dry or suffering from moderate drought conditions, but planting has gone very well and overall the crops are above average. Our large state continually provides new challenges and a wide range of conditions with which agricultural producers must tend. Our focus on soil health and conservation systems is leading to cleaner watersheds.

Dr. Ben McKnight has joined our team as AgriLife Extension State Cotton Specialist and even though we have limited in person contact, he has hit the ground running (see article on page 8). Just before the Covid crisis our graduate students were able to host the 6th Annual Plant Breeding Symposium (see article and photos page 14).

Hemp is the most rapidly expanding industry in Texas, with the passing of new laws and the development of regulations to implement those. We are pleased that Dr. Calvin Trostle has accepted the responsibility as AgriLife Extension State Hemp Specialist (see article page 10). Dr. Larry Redmon is coordinating the research protocols with the Texas Department of Agriculture to make sure we are in compliance as we begin to implement research for Hemp (see article page 11).

As we transition out of the spring semester, we enter the busy time for our Extension specialists. They spend a lot of time on the road during the late spring and summer months attending to research plots and conducting remote meetings with producers. We appreciate the efforts they make to help inform the public about science-based best management practices. Stories in this newsletter highlight just a few of those programs.

The search for a our soil hydrology position continues, but many others are on hold as we adjust to the impact of Covid on budget projections. We are especially anxious about our vacant turfgrass extension specialist position at College Station.

We wish all our students a happy and productive summer break. We look forward to the fall semester when they return refreshed and ready to take on new challenges. Stay safe!

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

More Information can be found at: http://soilcrop.tamu.edu/giving/
Congratulations!

to each of our students who will virtually receive an advanced degree this month!
While we are sorry your opportunity to walk across the stage has been delayed, we are
proud of you for the efforts you have made and wish each of you the very best!

Plant Breeding

Anil Adhikari

Anil earned his Ph.D. in Plant Breeding under the supervision of Dr. Amir Ibrahim. His research focused on genetic and genomic resources for hybrid wheat breeding.

He has accepted a position as a postdoctoral research associate at the University of Wisconsin, Madison.

Richard Bruton

Richard earned his Ph.D. in Plant Breeding under the supervision of Dr. Dirk Hays. His research focused on the application of remote sensing in agriculture.

He is starting a farm-to-table business focused on small-scale organic food production.

Jason Raines

Jason earned his Ph.D. in Plant Breeding under the supervision of Dr. Bill Rooney and Dr. Mark Hood of Corteva AgriScience.

His research focused on soybean tolerance to waterlogging and the use of remote sensing in phenotyping soybeans.

Jason will continue in his position as a research scientist at the Corteva Agriscience Research Center in West Memphis, AR.

Soil Science

Sarah Balke

Sarah earned her Master of Science degree in Soil Science under the supervision of Dr. Cristine Morgan. Her thesis focused on developing quantitative metrics for soil structure.

She has begun working as an environmental scientist at Golder Associates in Houston.
Josiane Argenta
Josiane earned her Master of Science in Agronomy under the supervision of Dr. Katherine Carson. Her research focused on the response of C3 and C4 weeds species to herbicides while under elevated CO2 and drought conditions. She is currently applying for positions with the intent of pursuing her Ph.D. at a later date.

Mahendra Bhandari
Mahendra Bhandari earned his Ph.D. in Agronomy focused on remote sensing. His supervising professors were Dr. Qingwu Xue, Amarillo, and Amir Ibrahim, College Station. He has accepted a position as a postdoctoral research associate at the Texas A&M AgriLife Research and Extension Center in Corpus Christi.

Will Bowling
Will earned his Master of Science in Agronomy focused under the supervision of Drs. Ben Wherley and Kevin McInnes. His research focused on the management of sand-capped golf course fairways. Will is currently interviewing for turfgrass positions in the Dallas-Ft.Worth area.

Garrett Flores
Garrett earned his Master of Science in Agronomy studying spent coffee grounds as an alternative soil amendment in sand-based rootzones. He conducted his research under the supervision of Dr. Ben Wherley. Garrett is now working as an arborist in Austin.

Seth Abugho
Seth earned his Ph.D. in Agronomy studying non-chemical weed control in rice under the supervision of Dr. Muthu Bagavathiannan. He has accepted a position as a postdoctoral research associate at Oregon State University, where he will be working on weed management in cool-season grasses.
Students earning a Bachelor of Science Degree from the Department of Soil and Crop Sciences - May 2020

Marissa Renée Bazan
Double Major
Horticulture & Turfgrass Science
Minor - Agronomy

Emily Elizabeth Bush
PSSC - crops emphasis

Ashley Nicole Carter
PSSC - crops emphasis
Minor - Agriculture Economics

Susana Castillo
PSSC - soil and water emphasis

Kevin Daniel Cloud
Turfgrass Science
Minor - Business

Morgan Ashley Combs
PSSC - crops emphasis

Ryan Edward Earp
Turfgrass Science
Minor - Business

Shelby Danielle Ferguson
Double major
Turfgrass Science and
PSSC - soil and water emphasis
Minor - Agronomy
Minor - Environmental Studies

Nickolas Allen Frisbee
PSSC - soil and water emphasis

Marla Karina Garza
PSSC - crops emphasis

William Eli Goad
PSSC - soil and water emphasis
Minor - Horticulture

Dillon Dean Harper
PSSC - crops emphasis

Regina Nicole Hernandez
PSSC - crops emphasis
Minor - Horticulture

Lisa Christine Howes
Double Major
PSSC and Bioenvironmental Sciences

Jessica Jane John
PSSC - crops emphasis

Garrett Ray Jones
PSSC - crops emphasis

Jake McLeod Jones
Turfgrass Science

Daniel Ray Lavy
PSSC - crops emphasis

Sarah Lorraine Marsh
PSSC - crops emphasis
Minor - Plant Breeding

Alejandra Martinez
PSSC - crops emphasis

Jared Mitchell Meyer
PSSC - soil and water emphasis

Michael Dylan Mullins
PSSC - soil and water emphasis

Michael Dillon Musgrove
Turfgrass Science

Aaron Christian Oefinger
PSSC - crops emphasis

Megan Lelayna Rasefske
PSSC - soil and water emphasis

Marcus Rose
Double Major - PSSC and Forestry
Minor - Environmental Sciences

Bailey Anne Scogin
PSSC - crops emphasis

Ezekiel Elias Soto
PSSC - crops emphasis

Maria Guadalupe Velazquez
PSSC - soil and water emphasis

*PSSC - Plant and Environmental Soil Sciences
Bethany Ann Busa  
Major - Animal Science  
Minor - Agronomy  

John David Duus  
Major - Ag Systems Management  
Minor - Agronomy  
Minor - Environmental Studies  

Caitlin M. Edsall  
Major - Agriculture Leadership  
Minors - Agronomy and Extension Education  

Lanna Stapper Freeman  
Major - Rangeland Ecology  
Minor - Agronomy  

Kyle Mark Hoelscher  
Major - Agriculture Leadership  
Minor - Agronomy  

Austin Ryan Kelly  
Majors - Rangeland Ecology and Ecological Restoration  
Minors - Agronomy and Bioenvironmental Sciences  

Jessica Joy Scheve  
Major - Nutrition  
Minor - Agronomy  

Trenton Lane Uptmore  
Major - Agriculture Leadership  
Minor - Agronomy  

Tizzy Mae Walker  
Major - Agribusiness  
Minor - Agronomy  

Students earning a Minor from the Department of Soil and Crop Sciences - May 2020

Joseph Awika, Ph.D., is now the Associate Department Head for Academic Programs in the newly formed Department of Food Science and Technology (FSTC).

Awika has held a joint appointment with the Department of Soil and Crop Sciences (75%) and the now defunct Department of Nutrition & Food Science (25%) since joining the faculty at Texas A&M University in 2008.

This spring, the Department of Nutrition and Food Science was restructured. Part of this reconstruction was the creation of the Department of Food Science and Technology, the area in which most of Awika’s research and teaching is focused.

Awika, will maintain a 25% appointment with Soil and Crop Sciences, with a 75% commitment to Food Science. In addition to his teaching and research duties, he has also assumed administrative duties in the new department.

“I am excited to be deeply involved in formulating the structure and vision for the new Food Science & Technology Department, while maintaining the very strong and productive collaborative efforts with Soil & Crop Science Faculty,” Awika said.

According to the letter from Bhimanagouda Patil, Interim Head of the Department of Food Science and Technology, Awika’s position will be 35% teaching, 50% research and 15% administrative.

“We wish Dr. Awika the best as he takes on his new role as Associate Department Head for Food Science,” said Dr. David Baltensperger, Soil and Crop Sciences Department Head. “We look forward to continued work with him on developing improved quality for our crops”

Awika, as well as his graduate students and staff, will continue to utilize office space and the laboratories in the Heep Center.
Congratulations!

Undergraduates were to be recognized at our annual awards banquet in April, where they would have received their scholarships for the 2020-21 school year and other special recognitions. We are happy to recognize them here, and offer our hearty congratulations.

Outstanding Soil and Crop Sciences Students

**Plant and Environmental Soil Sciences**

Senior
Sarah Marsh

Senior
Ryan Earp

Junior
Mackenzie Jeter

Sophomore
Keaton Emerson

Turfgrass Science

Junior
Caroline Gavranovic

Sophomore
Ty Riley

Freshman
Ariana Lazo
McKnight begins AgriLife Extension statewide cotton specialist duties

By: Kay Ledbetter

Ben McKnight’s acceptance of the Texas A&M AgriLife Extension Service statewide cotton specialist position is a return to familiar territory. McKnight started April 1 in the Texas A&M University Department of Soil and Crop Sciences at College Station.

McKnight named statewide cotton specialist-Ben McKnight, Ph.D., is the new Texas A&M AgriLife Extension Service statewide cotton specialist. (Texas A&M AgriLife photo)

Larry Redmon, Ph.D., associate department head and AgriLife Extension program leader for the department, said the Soil and Crop Sciences Extension Unit was excited to have McKnight fill the cotton specialist position in College Station.

“Ben is certainly no stranger to Texas having been born and raised in East Texas, or to Texas A&M as he obtained his master’s here in the Soil and Crop Sciences department. We look forward to Ben developing a strong state-wide cotton program and presence.”

McKnight, Ph.D., worked for both Texas A&M AgriLife Research and AgriLife Extension while earning degrees at Texas A&M. He has spent the past few years working as a weed scientist with Louisiana State University, where he earned his doctorate.

During his postdoctoral research and as a research associate at LSU Agricultural Center, McKnight conducted rice field trials at research and grower locations. As a graduate research assistant, he worked in the Rice Weed Management Program conducting and managing field and glasshouse trials.

McKnight said his transition back to Texas and into cotton should be smooth because he is driven by solving problems as an agronomist.

“There are quite a few similarities between cotton and rice regarding the intensity of management,” he said. “Both require extensive management to produce a successful crop. I am looking forward to drawing from my past experiences working in rice management in this new position. Accepting this position is also a homecoming for me. As a Texas native, I am very familiar with the passion that our growers and industry have for cotton production.”

From a field research standpoint, the plan is to continue evaluating many different research topics of interest to cotton production in the state, he said.

“One of the most important roles in this position is variety testing and getting the results of variety evaluations into the hands of our growers,” McKnight said. “Our program will continue to be very active in variety evaluation so our growers will have the information they need for on-farm decision making.”

He said some of the applied research efforts of his team will involve evaluation of fertility programs across the state, control of volunteer cotton plants and stalk destruction, just to highlight a few. Several of these research topics will be collaborative efforts with many other researchers, AgriLife Extension specialists and county agents.

“Some of my longer-term research interests include evaluating how various management decisions translate into profitability for our growers,” McKnight said. “Unfortunately, the highest yield doesn’t always translate into the highest level of profitability, and profitability is what keeps our growers in business.

“I am very passionate about helping growers develop management practices that increase their profitability. Our agency has many outstanding agricultural economists. I look forward to working closely with them to identify what kind of region-specific management decisions can enhance grower profitability.”

McKnight said the COVID-19 pandemic impacted his initial plans for outreach and education programming.

“I was looking forward to personally meeting our stakeholders across the state soon after starting in this position,” he said. “As of right now, I’m not sure how that will be impacted. Technology will be instrumental to keeping everyone in close communication and business running the best it can in these trying times.”

He has been making initial contacts with stakeholders and AgriLife Extension and research professionals across the state via telephone and online-based video conference platforms.

Long-term outreach and educational programming include continuing to work with others to develop high-quality resources, outreach and educational programs that improve Texas agriculture.

“I really enjoy interacting with people, so my hope is things will begin to normalize soon,” McKnight said. “I’m looking forward to getting out in the state to meet our stakeholders and my new colleagues. I’m a very hands-on learner, and I believe that most people in agriculture are too. So, I look forward to participating in field days and grower meetings, in addition to working with others to develop hands-on training activities for our county agents, producers and clientele in the future.”
Thanks to the generous support of former students and friends, the Department of Soil and Crop Sciences at Texas A&M University is able to present numerous scholarships to undergraduate students. These scholarships are typically presented at the annual awards banquet in April.

While the banquet had to be cancelled due to the COVID19 pandemic, the financial support for our students continues.

This year we awarded $59,150 dollars in scholarships to 21 undergraduate students.

We are very proud of our students and look forward to seeing them face-to-face again this fall.

Our scholarship recipients were:

**Weston Berry**, who received a Morris Merkle Endowed Scholarship.

**James Canales**, who received a Morris Merkle Endowed Scholarship.

**Brianna Cheek**, who received a Dick Holland Endowed Scholarship.

**Walker Crane**, who received the Allen & Joan Wiese Endowed Scholarship.

**Vanessa Davalos**, who received the Joe S. Campise Memorial Scholarship.

**Connor Destefano**, who received a Charles ‘63 & Lynann ‘66 Simpson Endowed Scholarship.

**Keaton Emerson**, who received the Frances & Miles Hall ‘39 Scholarship.

**Caroline Gavranovic**, who received the Texas Turfgrass Paul Drummet Scholarship, the Texas Turfgrass Association Scholarship, and the A.W. & Barbara Crain Scholarship.

**Gabriel Janish**, who received a Pat & Ed Runge Future Leaders Endowed Scholarship.

**Ty Jansky**, who received a Charles A. Schneider ‘70 Memorial Scholarship.

**Mackenzie Jeter**, who received the H. Jean Mills Endowed Scholarship, the Luther Jones Outstanding Junior Scholarship, and a Sunoco Endowed Scholarship.

**Ariana Lazo**, who received the Dr. Cleveland & Frances Gerard Scholarship, the J.F. Mills Endowed Scholarship, and the Martha F. & Albert Novosad ‘47 ‘54 Scholarship.

**Blaine Machicek**, who received a J. Charlie & Judy Blue Scholarship.

**John McCurdy**, who received the Kenneth Lindsey Memorial Scholarship, and a Charles ‘63 & Lynann ‘66 Simpson Endowed Scholarship.

**Katherine Meyer**, who received a Pat & Ed Runge Future Leaders Endowed Scholarship.

**Noriki Miyanaka**, who received the Olin & Thelma Smith Endowed Scholarship.

**Jacobb Pintar**, who received a J. Charlie & Judy Blue Scholarship, the Church Scholarship, and the James Foster Scholarship.

**Ty Riley**, who received the Jack Hulgan Memorial Scholarship, the Joseph D. Whitaker ’63 Scholarship, the Texas Turfgrass - William E. “Bill” McLaughlin Scholarship, the Sequor Foundation/Milberger Turfgrass Endowed Scholarship, and the Keith Ebanks Memorial Scholarship.

**Brody Schmalriede**, who received a J. Charlie & Judy Blue Scholarship, and the Billy, Gloria, & Gerry Conrad Scholarship.

**Ryan Schronk**, who received a Dick Holland Endowed Scholarship.

**Kathryn Watkins**, who received the Cecil & Ola Beasley Goodman Scholarship, and a Pat & Ed Runge Future Leaders Endowed Scholarship.
Calvin Trostle, Ph.D., Texas A&M AgriLife Extension Service agronomist, Lubbock, has recently been named the statewide hemp specialist for the agency.

“We’ve had a lot of excellent work being done by our AgriLife Extension Industrial Hemp Initiative team to prepare Texas for the production of industrial hemp,” said Dan Hale, Ph.D., AgriLife Extension associate director — agriculture and natural resources, College Station, in announcing the new position.

“Dr. Trostle has worked tirelessly in this area and has already been serving in a lead specialist capacity. He will do an excellent job in helping lead our Initiative team’s and agency-wide Extension and research activities.”

While the U.S. Department of Agriculture was finalizing federal regulations and guidelines, along with the Texas Department of Agriculture writing of state regulations and guidelines and getting them approved by the USDA, Trostle was already at work.

AgriLife Extension’s industrial hemp education team helped develop resources for agents and specialists to utilize across the state in producer and public education programs. Trostle led or participated in about 20 educational hemp seminars from Dumas to the Lower Rio Grande Valley. He also made trips to New Mexico, Oklahoma and Colorado, where hemp is already legal to grow, in order to learn more about the crop.

Industrial hemp hasn’t been grown in Texas since the 1930s, when there was some hemp production in South Texas. So, there’s no track record of what varieties might work in Texas, and only this year will there be any research on industrial hemp, Trostle said.

Trostle said initial hemp field efforts will begin with implementing the Texas A&M AgriLife variety testing program for hemp. These hemp cannabinoid, fiber and grain trials are planned for Plainview, Commerce, San Angelo and College Station.

“We won’t be able to implement meaningful planting date studies until 2021,” he said. “Procuring funding for any field work will be key in how quickly we can address research questions.”

Another of Trostle’s initial objectives for Texas hemp is investigating and encouraging improved hemp seed quality.

“Apart from business issues, poor seed has been the No. 1 production issue in most states already growing hemp,” he said.

Trostle grew up on a farm and ranch in eastern Kansas. He earned his bachelor’s degree in agronomy from Kansas State University, his master’s in soil chemistry from Texas A&M University and his doctorate in soil science from the University of Minnesota. He joined AgriLife Extension at Lubbock in 1999 after three summers in rice research at the Texas A&M AgriLife center in Beaumont.

The new title of statewide hemp specialist fits in with how has been known in West Texas – as the “alternative crops guy.” After serving in Lubbock for two years and learning more about the region’s farming, Trostle said he chose to pursue a broad working knowledge on many different crops rather than focus heavily on just one or two.

“I believe I made the right decision,” he said. “That approach has positioned me better to start from scratch with learning about hemp.”

He also is currently the state specialist for sunflowers, as well as provides education and applied research support in the South Plains region and across Texas for grain sorghum, sunflowers, peanuts, wheat/small grains, guar, alfalfa, winter canola, summer annual forages and sesame.

Trostle said while he knows this first year or two of hemp work will keep him busy, he will maintain his educational programs on all the crops he’s working with.

“I want farmers of grain sorghum, wheat, alfalfa, peanuts, guar and other crops to know that I remain fully committed to maintaining my Extension support to their cropping needs. I will have to reduce my field work in these crops, but the 21+ years of experience I have gained isn’t going anywhere.”

Trostle can be reached at 806-746-6101 or ctrostle@ag.tamu.edu. He has written a monthly hemp newsletter since November and has initiated an AgriLife Twitter account @TXAgriLifeHemp. Trostle also contributed to the AgriLife Extension hemp resources page, along with members of the hemp team.
Texas A&M AgriLife will be planting hemp variety trials for the first time this spring, with a goal to provide producers, hemp seed companies and the larger hemp industry with a reliable, independent scientific assessment of hemp varietal performance in Texas.

Calvin Trostle, Ph.D., Texas A&M AgriLife Extension Service agronomist and statewide hemp specialist, Lubbock, said they will begin implementing the Texas A&M AgriLife fee-based variety testing program for hemp cannabinoid, fiber and grain at Plainview and San Angelo under irrigation, and Commerce and College Station, both rainfed.

These trials will be conducted under the long-time Texas A&M AgriLife Crop Testing Program, which is a combined effort of AgriLife Extension and Texas A&M AgriLife Research faculty, Trostle said. This self-supporting program has offered public variety trials for wheat, grain sorghum, corn, sunflowers and soybeans, as well as other crops, for decades.

Due to the urgency to get trials planted in May, the due date for receiving entry forms, seed and payment is May 8. Anyone with questions about the program and protocol should contact Trostle at ctrostle@ag.tamu.edu or call 806-777-0247. He can provide the program description, fee structure and entry form, which can also be accessed at http://varietytesting.tamu.edu.

“The variety trials are the next step in educating potential hemp producers. The team has already gathered many hemp resources since that time. However, this is the first step in conducting Texas testing.

“Trial results for crops tested by Texas A&M AgriLife are used by farmers across Texas to make decisions on their planting seed,” said Larry Redmon, Ph.D., AgriLife Extension program leader for the Department of Soil and Crop Sciences and associate department head. “Our goal is that Texas hemp producers may enjoy the same type of information for their seed selection decisions.”

Utilizing the full expertise and resources of Texas A&M AgriLife, Trostle said it is especially important to identify varieties with low THC. THC must remain at or below 0.3% or the crop must be destroyed. As such, THC levels and seed quality are two of the main issues other states have dealt with since hemp was legalized.

He said the entry fees charged will cover the cost of conducting the program, which was established after reviewing the methodology of the few hemp variety trials to date conducted in other states.

“We will seek a balance between a bare-bones approach vs. an intensive assessment of hemp variety growth and performance,” Trostle said.

“This year will be trial run in some ways as we prepare for broader statewide testing, including South Texas in 2021,” he said. “For now, we are emphasizing seed trials rather than transplants or clones, though we will consider those planting stocks if needed.

“Long-term we believe field agriculture hemp will move toward mostly seeded production, which should have lower costs. With AgriLife’s eventual emphasis on certified Texas hemp seed, I think this will fix some of the concerns we hear about poor seed quality in other states.”

Certified seed should have improved genetic purity, higher germination and seedling vigor, Trostle said.

“If you are interested in participating, please notify me as soon as you can as we are working on the individual sites for field preparation,” Trostle said. “We will do our best to accommodate all interested companies, but if we receive more entries than we can handle, we will ensure that each company is represented as best we can. If the small-plot research is still tight for available planting area, we will choose submissions that are pursuing certified seed status in Texas.”

http://varietytesting.tamu.edu/hemp/
Genomes of five cotton species unveiled by Texas-rich research team

Cotton – we touch it every day. From clothes to medical supplies to animal feed, cotton continues to increase in quality. A recent collaborative, including Texas A&M researchers, is making sure this amazing crop, and thus the products made from it, will continue to be efficiently bred, grown and produced.

The multi-institutional research team sequenced five cotton species, including Upland and Pima cotton grown here in Texas, as well as globally. Contributions to the effort from Texas involved Texas A&M University, Texas A&M AgriLife Research and the University of Texas – Austin.

The most recent issue of Nature Genetics reports on the results of this collaboration — high-quality genome-wide sequence assemblies for each of five 52-chromosome species of the cotton genus Gossypium, a member of the Malvaceae family, which also includes okra, kenaf, hibiscus, durian and cacao.

The overall project was funded primarily by the National Science Foundation, and led by Z. Jeffrey Chen, Ph.D., a former student and former faculty member of Texas A&M who now holds the D. J. Sibley Centennial Professorship in Plant Molecular Genetics at the University of Texas at Austin.

Breeding cotton typically increases economic yield through better productivity, better quality of products and improved sustainability by providing better pest resistance and drought resilience, said David Stelly, Ph.D., a co-principal investigator in the National Science Foundation project and AgriLife Research cotton breeder in the Texas A&M Department of Soil and Crop Sciences, College Station.

“Globally, cotton is the premier natural fiber crop of the world, a major oilseed crop and an important feed crop,” Stelly said. “This report establishes new opportunities in multiple basic and applied scientific disciplines that relate directly and indirectly to genetic diversity, evolution, wild germplasm utilization and increasing the efficacy with which we use natural resources for provisioning society.”

The cotton genome research project

While fiber removed from the cotton seed is of greatest value, ginned seed also provides significant additional value as a source of vegetable oil and/or dairy cattle feed. The recent data and findings provide immediately accessible resources for basic and applied research, including breeding and gene editing.

The other three species sequenced originate from Hawaii, the Galapagos Islands or Ecuador and Brazil. They remain undomesticated but are sources of prospectively useful genetic differences. The Nature Genetics report should facilitate use of all five species in genomics-aided cotton breeding programs.

Stelly said the importance of the assemblies may be accentuated by the extreme complexity of cotton’s genome. It contains a relatively large number of genes, about twice as many as occur in most flowering plants with simple genomes.

The researchers report that sequences of these five species’ genomes will provide long-needed genomics resources and insights that will facilitate genetic improvements needed to maintain economic yield from production, enhance quality and value of the fiber and seed products, and further improve sustainability-enhancing features, such as resistance to pests, pathogens, drought and heat-resilience.

Contributions from Stelly’s laboratory

Contributions from Texas A&M came through Stelly’s laboratory. A key finding by graduate student Luis De Santiago was the detection and mapping of numerous “haplotypic blocks” throughout the genome of Upland cottons.

Stelly explained these present a major challenge for breeding, because they are both non-recombinant and virtually uniform among cultivars. Evidence corroborating the haplotypic blocks was obtained from analyses of genetic recombination, also involving Yu-Ming Li and former student Amanda Hulse-Kemp, Ph.D.

Also, from Stelly’s laboratory, researchers Robert Vaughn, Ph.D., provided plant, seed and nucleic acid samples to the team, and Bo Liu, Ph.D., provided integrative molecular cytogenetic mapping data.

“This kind of mega-project takes a lot of time and effort, but can yield game-changing results, and this one certainly has done that,” Stelly said. “Already, we are seeing paradigm shifts in what we and others are doing and thinking about doing. These kinds of data are vital to our research and breeding efforts and open many doors for exploration.”

He also emphasized collaborations and individual contributions are instrumental to success.

“Research projects like this unlock agriculture’s potential,” said Patrick J. Stover, vice chancellor of Texas A&M AgriLife, dean of the College of Agriculture and Life Sciences and director of Texas A&M AgriLife Research. “By developing crops that enhance health and increase profitability, we not only improve cotton immediately, but the way we approach this data and findings provide direction for basic and applied research far into the future.”

“The Soil and Crop Sciences Department appreciates the leadership of Dr. Stelly in guiding this project to completion and providing the vision for implementing the results to benefit our cotton producers,” said David Baltensperger, Ph.D., department head, College Station.
Cotton acreage continues to boom in the High Plains north of Interstate 40, more than doubling in the past five years. And whether that is due to water savings or projections for improved profitability, Texas A&M AgriLife Extension Service specialists don’t foresee a slowdown in growth in the near future.

Since 2013, there has been a significant increase in cotton acreage in the Texas High Plains, said Jourdan Bell, Ph.D., AgriLife Extension agronomist, Amarillo.

Driving this acreage explosion is primarily the reduction in the saturated thickness of the Ogallala Aquifer in this region, which has resulted in declining irrigation well capacities, Bell said. As a result, producers are finding it harder to meet the full crop water demand of corn.

Because cotton is a drought-tolerant crop, it is an excellent companion crop for Texas High Plains irrigated acres, she said. Incorporating cotton into a corn rotation allows producers to concentrate irrigation on corn and maintain corn production goals while planting their remaining irrigated acreage to a drought-tolerant crop.

Of significance, new early and early mid-maturity cotton varieties are better adapted to this production region with improved yield potentials, Bell said.

**Breaking down the numbers**

“The most interesting commonality among the counties with the most growth is their location; four of the five are located north, or largely north, of the Interstate 40 corridor,” said Justin Benavidez, Ph.D., AgriLife Extension economist, Amarillo. “The growth in cotton acreage north of Amarillo is largely a result of agronomic factors and, one year of difficult planting aside, doesn’t seem to be slowing down.”

Between 2013-2019 total cotton acres in the northernmost 26 counties of Texas, referred to as the High Plains Trade Area, increased 126%, from about 404,000 acres to almost 915,000 acres.

The change in acreage was not spread evenly across the region, he said. Between 2013-2018, cotton production in Hansford, Parmer, Sherman, Moore and Carson counties grew 301%, to over 250,000 acres.

Even comparing the change from 2013-2019 and including the significant prevented-planting issues in 2019, acreage in the same five counties increased 128%, to over 100,000 acres, Benavidez said. The largest growth in cotton acres occurred primarily between 2016-2018. New cotton acres replaced corn and sorghum, both of which saw acreage declines in the region during that period but have since rebounded.

**AgriLife Extension helps with High Plains cotton variety selection**

Since 2014, AgriLife Extension has expanded its cotton programming efforts in the northern High Plains to meet producer needs, Bell said. Annually, Replicated Agronomic Cotton Evaluations, or RACE, trials are conducted across the state by regional agronomists in coordination with AgriLife Extension county agents and farm cooperators. The RACE trials provide producers an unbiased comparison of varieties being marketed in their respective regions.

“Variety selection is one of first decisions a producer makes each season,” she said. “So, timely variety trial data can assist with preplant variety selection.”

These large-plot replicated trials permit variety evaluation across multiple management and environmental conditions. This allows agronomists like Bell to assess variety stability.

**The bottom line**

Bell said while some of the acreage growth in cotton could be due to the attractive price of cotton compared to grain, she attributes most of the acreage change to cotton’s need for less water and improvements in cotton technologies.

For many, it becomes a matter of managing irrigation at a deficit rate, which is not profitable with corn due to the reduction in crop productivity, she said. Consequently, farmers are diversifying their cropping systems to maximize farm productivity and profitability, and that will mean more cotton acres in the future.
2020 Plant Breeding Symposium

Shortly before the COVID-19 pandemic began closing doors and initiated social distancing, graduate students from the Department of Soil and Crop Sciences held their six annual Plant Breeding Symposium in the Memorial Student Center at Texas A&M University.

The symposium is part of the Corteva Plant Science Symposia series.

This year’s symposium, titled “Foresight 2020: Tuning crops for future needs” emphasised the challenges breeders face to fit today’s crops to tomorrow’s needs.

Keynote speakers discussed underutilized crops as well as new uses for those with which we are more familiar.

The symposium committee presents three travel scholarships to students at other universities as well as three rapid oral presentation awards to Aggie students. Each year, the award winners present their research at the symposium.

This year’s travel award winners were:

Ryan Bryant-Schlobohm, a Ph.D. student from Oklahoma State University, who presented his research on enhancing yield and cold tolerance of bermudagrass using SSR markers.

Melike Cirak, who is receiving her Master of Science from Oregon State University this spring, presented her research on persistent color genotypes in snap bean.

Nathaniel Burner, a Master’s student from North Carolina State University, who presented his research on reducing nicotine in flue-cured tobacco.

The Aggies receiving the rapid oral presentation awards were:

Catherine Danmaigona Clement, a Ph.D student under Drs. Jane Dever, Libo Shan and Steve Hague, who presented her research on fusarium wilt in cotton.

Jorge Valenzuela-Antelo, a Ph.D. student under Drs. Amir Ibrahim and Shuyu Liu, who presented his research on the use of gene editing in hard white winter wheat.

Cynthia Sias, a Master’s student under Dr. Muthu Bagavathiannan, who presented her research on understanding the interspecific hybridization between grain sorghum and johnsongrass.

The graduate students have begun planning the 7th annual symposium, which is scheduled to take place in February 2021. Any students wishing to join the committee are invited.
More from the Plant Breeding Symposium

The 2020 Plant Breeding Symposium planning committee and the keynote speakers from left to right: Mitchell Kent; Ze Feng; Xiaoqing Shen; Jales Fonseca; Dr. Gerald De La Fuente, Sesaco Corp.; Dr. William Tracy, University of Wisconsin-Madison; Dr. Alan Chambers, University of Florida; Dr. Isabel Vales, Texas A&M University; Dr. Elliot Heffner, Corteva AgriScience; Tia Dunbar; Daniel Crozier; Roy Davis; and Jeewan Pandey.
Sympathies and Concerns

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

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

Diane Boellstorff and her family as they mourn the loss of her father, who passed away April 8. Diane is an associate professor and the AgriLife Extension water resource specialist.

Dawn Deno and her family as they mourn the loss of her father, William Schroeder, who passed away April 27. Dawn is a research specialist in the cotton improvement lab in College Station.

Calendar

May

13 - P&T meeting - Mid Term (if needed)
20-21 - McFadden Symposium, Manhattan, KS
25 - Memorial Day Holiday (CS campus)
27 - Septic System Workshop, Brenham, TX Contact: wling@tamu.edu
31 - Evaluations are due!!

June

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

July

9 - Annual Beaumont Rice Field Day
19-21 - Texas Turfgrass Assoc. Summer Conference, Horseshoe Bay, TX
23 - Healthy Lawns Healthy Waters Workshop, Weslaco, TX Contact: johnwsmith@tamu.edu
28 - Healthy Lawns Healthy Waters Workshop, Mt. Belvieu, TX Contact: johnwsmith@tamu.edu