January/February 2020

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A new year, a new decade, and we already have nearly two months of it behind us. We like to think of winter as the “slow time” for agriculture, but with our retreat, conferences, meetings and planning for the next crop season the days seem to fly by.

In the past two months we have attended the Texas A&M AgriLife Annual Conference, Beltwide Cotton Conferences, our departmental annual meeting, and more. Many of our faculty, staff and students have come home with awards (see pictures inside). Congratulations to you all.

As the semester ended in December we said farewell to our two Borlaug Fellows from Egypt. They returned home with new experiences to share with the farmers in their countries (see story page 11).

Our turfgrass program is transitioning rapidly. This month we welcomed Dr. Chase Straw to the department as an Assistant Professor of Turfgrass Science. He fills the position held by Dr. Richard White, who retired in 2018 (see story page 3).

As Dr. Straw settles in, our Extension position will become available. Dr. Becky Grubbs-Bowling has accepted another position and will be leaving March 2 for Dallas (more information next month on her opportunities at Dallas). We wish her well with her new endeavor. A high priority request for the department will be refilling this position.

I had the opportunity to participate in the National Agricultural Research, Extension, Education, and Economics (NAREEE) advisory board meeting in Las Cruces recently and to review the USDA efforts on climate change. Our department is heavily involved with developing science to better capture and integrate carbon into our soils. Healthier soils will be a driving force as we move forward. We are currently arranging for interviews to replace Dr. Cristine Morgan and her leadership in this arena and will be adding to our soil micro expertise at the El Paso Research and Extension Center as we begin recruitment for a position there.

USDA released their strategic plan for research at this meeting and it is strikingly similar to the ideas we have discussed as a College, Agencies and Department.

Both Texas A&M AgriLife Research and Extension are developing their strategic plans. It fit well that we were able to have our faculty retreat in December, so we have great ideas to share in the next level planning process. I am also actively involved with the strategic planning process for CAST as chair elect.

In the coming months we will see more new faces as some of our open positions have been filled. Dr. Fernando Guilien Portal will join us March 1 as our Extension Specialist for Small Grains, and Dr. Benjamin McKnight has accepted the State Cotton Extension Specialist position. He will join us in mid-April. We look forward to their leadership in these roles.

Ground preparations have begun for the 2020 crops, and as spring pushes in our faculty will be busy getting fields planted. We hope the weather cooperates this year and wish everyone a successful crop production year.

Our graduate students just wrapped up their sixth Plant Breeding Symposium. Congratulations to them all for another excellent program. Congratulations also to our student presenters and winners of the poster contest (pictures will be in next month’s newsletter).

Enjoy the Bluebonnets!

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/
Dr. Chase Straw has joined Texas A&M University and Texas A&M AgriLife Research as an Assistant Professor in the Department of Soil and Crop Sciences turfgrass program. He will be assuming the duties of retired professor Richard White in a tenure track position which is 30% teaching and 70% research.

Straw comes to College Station from St. Paul, Minnesota, where he held a postdoctoral position in the University of Minnesota Department of Horticulture. A native of Frankfort, Kentucky, Straw earned his Bachelor of Science degree in Plant and Soil Sciences (Turfgrass Science) from the University of Kentucky. He then went on to earn both his Master of Science and Ph.D. in Crop and Soil Science (Turfgrass Science) from the University of Georgia.

“My primary research interest focuses on precision turfgrass management,” said Straw. “This involves interdisciplinary approaches aimed at understanding the spatial and temporal variability of turfgrass systems in order to develop practical strategies for reducing management inputs and improving the overall user experience.”

He also conducts general turfgrass management and physiology research that addresses issues faced by the turfgrass management professionals and the turfgrass industry as a whole.

Straw’s teaching role will begin with the fall 2020 semester. He will teach undergraduate courses in turfgrass management systems (SCSC-429) and turfgrass maintenance (SCSC-430) and oversee undergraduate research (SCSC-491). He will also join Dr. Ben Wherley to co-teach Professional Development in Turfgrass Science (SCSC-312).

Until then, Straw will be focusing on his research and forming relationships with collaborators throughout Texas. He will also co-advice the Aggie Turf Club and turf students.

“I am extremely excited to be in this position at Texas A&M,” Straw said. “I look forward to meeting and getting to know everyone in the department.”

Straw is a member of the International Society of Precision Agriculture, Turfgrass Producers International (TPI), Crop Science Society of America (CSSA), the Sports Turf Managers Association (STMA) and the Golf Course Superintendents Association of America (GCSAA).

While a graduate student, he received the Chris Stiegler Turf Science Fellowship from CSSA. He received the Dr. James Watson Scholarship from the STMA as both a graduate and undergraduate student.

Chase is married to Elizabeth Straw and has two boys, Ryan (5) and Sam (1).

Dr. Chase Straw

Braxton Smidovec is the new student worker in our business office.

He is a sophomore majoring in Agricultural Economics - Finance and Real Estate Option. A native of La Grange, TX, Braxton grew up in a rural environment. His dad’s side of the family raises cattle and his grandparents have a pecan orchard with “lots of pecan trees”.

“I am a first generation Aggie, but I have relatives who are Aggies and was raised in an Aggie household,” Braxton said.

Braxton plans to pursue a career in either real estate or the lending industry.
Each year the Department of Soil and Crop Sciences recognizes staff members, graduate students, and collaborators for their efforts. The Special Achievement Awards are presented at the department’s annual meeting in January.

Recipients are nominated by coworkers, faculty and/or staff with the final selections being made by the awards committee.
Departmental Awards continued

Collaborating County Extension Agent Award
Jason Ott - Nueces County

Extension/Technical Staff Support - Field
John W. Smith

Extension/Technical Staff Support - Lab
Dale Croxdale

Special Service Recognition Award
Beakley Farms - Bob & Steven Beakley

Research Faculty Award
Dr. Shuyu Liu

Research Support Staff Award - Lab
Dr. Robert Vaughn

Post-Doctoral Research Award
Dr. Darren Chevis

Teaching Faculty Award
Dr. Katherine Carson
Award winners unable to attend the awards presentation included:

- B.B. Singh Award for Outstanding Thesis Research Crop Sciences
  Aniruddha Maity

- Research Support Staff Award - Field
  Stephen Labar

- Extension Faculty Award
  Dr. Calvin Trostle

**Longevity Awards**

- 25 years of service
  Dr. Scott Finlayson
  Associate Professor
  Plant Development
  College Station, TX

- 30 years of service
  Dr. Russell Sutton
  Assistant Research Scientist
  Commerce, TX

- 20 years of service
  Dr. Russell Jessup
  Associate Professor
  Perennial Grass Breeding
  College Station, TX
Several members of our department were recognized recently for their outstanding efforts. Faculty, staff and graduate students were all represented well by these individuals.

**Vice Chancellor’s Awards in Excellence**

**Al Nelson**, left, received the 2019 Vice Chancellor’s Award in Excellence for Special Services from Dr. Patrick Stover, Vice Chancellor and Dean, College of Agriculture and Life Sciences, Texas A&M University during the annual awards ceremony in January, 2020. Al is the manager of the Texas A&M University Farm. (Photo by Michael Kellett)

The **Wheat Genomics Team** received the 2019 Vice Chancellor’s Award in Excellence for Team Collaboration from Dr. Patrick Stover, Dr. Patrick Stover, Vice Chancellor and Dean, College of Agriculture and Life Sciences, Texas A&M University during the annual awards ceremony in January, 2020. The team includes (l-r) Drs. Richard Metz, Charlie Johnson, Amir Ibrahim, Jackie Rudd, Chenggen Chu, Shichen Wang and Shuyu Liu. (Photo by Michael Kellett)

**Dean’s Outstanding Achievement Awards**

**LeAnn Hague** received the Dean’s Outstanding Achievement Award for Staff from Dr. Patrick Stover, Vice Chancellor and Dean - College of Agriculture and Life Sciences at Texas A&M University. LeAnn is the Program Manager and Advisor in the Department of Soil and Crop Sciences Academic Office. (Photo by Michael Kellett)

**Aniruddha Maity**, a Ph.D. student in Plant Breeding under Dr. Muthu Bagavathiann, was selected to receive the Dean’s Outstanding Achievement Award for Graduate Research during the recent awards ceremony. Maity was unable to attend as he was in Australia conducting research.
Dr. C. Wayne Smith was named as a Senior Faculty Fellow of Texas A&M AgriLife Research during the annual AgriLife Conference in January. He received his award from Dr. Patrick Stover, Director, AgriLife Research. Smith is the Associate Department Head - Teaching for the Department of Soil and Crop Sciences. (Photo by Michael Kellett)

Dr. Girisha Ganjegunte received the 2019 Texas A&M AgriLife Research Director’s Award for Researcher of the Year from Dr. Patrick Stover, Director AgriLife Research, during the annual conference in January. Ganjegunte, a Professor in the Department of Soil and Crop Sciences, is stationed at the AgriLife Research and Extension Center in El Paso. (Photo by Michael Kellett)

Dr. Qingwu Xue, an Associate Professor and Faculty Fellow in the Department of Soil and Crop Sciences, was part of a team that received the AgriLife Research Director’s Award for Collaboration during the AgriLife Conference in January. Pictured are team members (l to r) Xue, Gary Marek, a representative for Jiang Hu, Thomas Marek, Dana Porter and Dr. Patrick Stover, Director, AgriLife Research. (Photo by Michael Kellett)

Texas A&M AgriLife forage workers met at the Scotts turfgrass facility on the Texas A&M University campus during the 2020 AgriLife Conference to discuss strategy for the upcoming year.
Texas A&M University Department of Soil and Crop Sciences faculty, staff and graduate students participated in the 31st Annual Texas Plant Protection Association (TPPA) Conference in College Station in December.

Many of those participating brought home awards from the various competitions.

In the Pest Identification contest, AgriLife Extension Program Specialist Dale Mott topped the competition. Mott works with the cotton program.

Graduate students at both the Master of Science and Ph.D. level competed in a poster contest during the conference. Winners were:

**Master’s category:**

First Place: Zachary Howard - “Evaluation of Chemical Control Options for Smutgrass (Sporobolus indicus) in Texas”. Zach is an agronomy student under Dr. Scott Nolte.

Second Place: Cynthia Sias- “Understanding Interspecific Hybridization between grain sorghum (Sorghum Bicolor) and Johnsonsgrass (Sorghum halepense)”. She is an agronomy student under Dr. Muthu Bagavathiannan.

Third Place: Mason House- “Comparison of Ground and Unmanned Aerial Sprayer Individual Plant Treatment Method for Control of Smutgrass (Sporobolus indicus)”. He is an agronomy student under Dr. Scott Nolte.

**Ph.D. category:**

First Place: Chengsong Hu- “Seed production estimation of late-season common waterhemp (Amaranthus rudis) escapes in soybean using drone imagery”. He is a biological and agricultural engineering student under Drs. Muthu Bagavathiannan and Alex Thomasson.

Second Place: Jorge Valenzuela-Antelo- “Mapping of Traits Adaptive to the U.S. Southern and Central Great Plains in a ‘TAM 204’/‘Iba’ Population”. He is a plant breeding student under Dr. Amir Ibrahim.

Third Place: Rohith Vulchi- “Stewardship practices in XtendFlex Cotton and economic Analysis”. He is an agronomy student under Dr. Scott Nolte.

James Griffin receives the award for TPPA Outstanding Graduate Student - Ph.D. from TPPA Board Chairman Ray Smith. Griffin is a Ph.D. student under Drs. Gaylon Morgan and Robert Hardin (Department of Biological and Agricultural Engineering). (Texas A&M AgriLife Communications photo by Laura Muntean)

Outgoing TPPA President Clark Neely (left) presented the awards for the pest identification competition. Winners were: Dale Mott, AgriLife Extension program specialist, Gary Kennedy, crop consultant, and Travis Janak, agronomist. (Texas A&M AgriLife Communications photo by Laura Muntean)

Cynthia Sias, a Master’s student under Dr. Muthu Bagavathiannan, receives the TPPA Outstanding Graduate Student - Master’s from TPPA Board Chairman Ray Smith. Sias also placed second in the Master’s poster contest. (Texas A&M AgriLife Communications photo by Laura Muntean).

Graduate student Colby Ratcliff, represented J.R. Simplot at the TPPA Conference. (Photo by Beth Ann Luedeker)

Poster winners included Chengsong Hu, above, Zach Howard, above-right, and Mason House, right. The winners received their awards from Poster Chair Josh McInty (left) and outgoing TPPA President Clark Neely (right). (Texas A&M AgriLife Communications photos by Laura Muntean)
Faculty retreat aids in strategy development

By: Steve Hague

The faculty of the Department of Soil and Crop Sciences held a 3-day retreat in mid-December at the Texas A&M Hotel and Conference Center. It was a chance for our faculty from across Texas to come together for professional development and to develop strategies for our Department’s next strategic plan.

Several AgriLife administrators provided their insight during the retreat. Among those who spoke included Dr. Patrick Stover, Vice-Chancellor and Dean for the College of Agriculture and Life Sciences; Dr. Dan Hale, Associate Director for Ag and Natural Resources, Texas A&M AgriLife Extension Services; Dr. Jeff Hyde, Director of Texas A&M AgriLife Extension Services; Dr. David Ragsdale, Chief Scientific Officer and Associate Director of Texas A&M AgriLife research; and Dr. Clare Gill, Executive Associate Dean and Associate Dean for Research for the College of Agriculture and Life Sciences, Texas A&M University.

The retreat focused on enhancing our Department’s effectiveness with 1) faculty recruitment and retention; 2) garnering federally funded grants; 3) the promotion and tenure process; 4) graduate student success; and 5) undergraduate student success.

Working groups were led by Drs. David Baltensperger, Larry Redmon, Terry Gentry, Jacqui Aitkenhead-Peterson, Diane Boellstorff, Bill Rooney, and Paul Schwab. The participation and brainstorming from this event will help guide the Department into the next decade.

Graduate student earns trip to the nation’s capital

By: Beth Ann Luedeker

Rahul Raman, a doctoral student under Dr. Nithya Rajan, has been selected as one of 18 graduate students nationwide to receive the 2020 Future Leaders in Science Award. The award will be formally presented March 2, 2020, in Washington D.C.

The award includes a trip to participate in the annual Congressional Visits Day, hosted by the Agronomy Society of America (ASA), Crop Science Society of America (CSSA) and Soil Science Society of America (SSSA), on March 3.

During the visit, the participants will meet with members of Congress and advocate for food, agriculture and natural resources research.

Last fall, Raman and two other Texas A&M students were selected to participate in the Scientists Engaging and Educating Decisionmakers (SEED) ambassador program.

“My previous experiences as a Climate Science Advocate in Washington D.C. and as a SEED Ambassador will help me to discuss the gaps between science and policy effectively, and to help come up with ideas to merge that gap,” Raman said. “My intent towards this award was to get connected with policy-makers, understand the congressional legislative process, and then work with them on issues related to agricultural research and funding.”

After completing his Ph.D., Raman plans to return to India and work toward global food security with an international agency such as CGIAR/UN.

“For global food security, research is important,” Raman said. “But better policies and funding towards research are also important to achieve this goal.”

In many African and Asian countries, including India, food security is an issue. Raman believes that involvement with policy makers in the United States will help him better understand the processes and policies of other countries and organizations as well.

“My science advocacy experiences will help me to better communicate my work to policy-makers back in India, and to plan accordingly for the resources I will need to conduct my work,” Raman said.
Researchers from Egypt spent several months in Texas last fall working with faculty from the Department of Soil and Crop Sciences at Texas A&M University as part of the Borlaug International Agricultural Science and Technology Fellowship Program.

Dr. Samir Mohamed worked with Dr. Jake Mowrer; and Anas Mohamed Safaa Al-Din Sharshar teamed up with Dr. Amir Ibrahim.

Samir is an Associate Professor in the Department of Agricultural Microbiology at Minia University, Minia, Egypt, with a focus on soil/plant/microbe/environment interactions. Several of his current projects investigate the effects of biochar.

“Through this fellowship I hope to improve my understanding of the nexus of leguminous crop production under arid/semiarid condition, biochar amendments to the soil, and legume/rhizobia nitrogen fixation,” Samir stated. “I also expect to learn new technologies to measure plant performance and rhizobia bacteria activity.”

Anas is a wheat researcher at the Agriculture Research Center, Field Crop Research Institute in Giza, Egypt.

“The Borlaug program will give me a chance to recognize the new techniques in wheat breeding, both traditional and molecular marker breeding,” said Anas. “I will also benefit from the seminars and lectures, and make new friends from a different country.”

The Fellows returned home in December, but the program does not end there.

“We will continue to communicate with each other and pursue opportunities for future collaboration,” said Mowrer. “We will also co-author a manuscript for publication based on the research we performed together.”

Borlaug International Agricultural Science and Technology Fellowship is a program of the USDA Foreign Agricultural Service aimed at promoting food security and economic growth by providing training and collaborative research opportunities to fellows from developing and middle-income countries.
Massive amounts of agricultural data are being collected around the world by scientists utilizing drones for remote sensing, agronomic yield measurements or plant breeding variety trials.

Seth Murray, Ph.D., Texas A&M AgriLife Research corn breeder, College Station, called upon the agricultural scientific community to address the lack of plans or infrastructure to catalogue and make this data accessible for future research and synthesis during the recent Crop Science Society of America conference in San Antonio.

“We have this huge emerging problem centered on big data,” he said.

Murray said big data permeates all facets of agricultural research and agricultural production. When properly curated, this data can be used beyond initial experiments, providing inexpensive but valuable opportunities to improve breeding and management knowledge from experiments that were never planned.

“Not a lot of people are thinking about this, but it will be a real pain to try to go back and find data later, so we need to address it now,” he said. “Right now, people generate data, keep it on their local computer, write a paper, and then are supposed to put the data somewhere.”

But where that “somewhere” is remains unclear in many cases, and there is no organized effort being made to anticipate it, Murray said.

“Think of the world of genomics,” he said. “The data is accessible through the National Center of Biotechnology Information, where you can access nearly any species’ genomic data in this world and search across species.

“I think we should really learn from the genomics field – it’s the gold standard in publicly pooling data,” Murray said. “I think history is very useful; we can learn from other people’s mistakes. When you look at the genomics data explosion, one big lesson was to get reasonably prepared for the amount collected.”

Murray said his research program is using unoccupied aerial vehicles, or UAS drones, to collect remote sensing data throughout the growing season and then turn the data into actionable information for plant breeding through the FAIR data principles – Findable, Accessible, Interoperable and Reusable.

“There are a lot of things in the world of genomics that hit all the FAIR standards and allow people to do these really complicated cool analysis on the origins of life based on data a corn breeder may have collected,” he said. “But there’s nothing like this when it comes to remote sensing data. There’s nothing like this when it comes to plant breeding data. We don’t have these repositories like NCBI to store and communicate data.”

Think data use and reuse with drones, he said. Data collection is the easiest part of the process. The harder part is all the further work with the data – stitching together images like the panorama feature on cameras, making 3D point clouds, extracting the data for each plot – before exporting it from GIS software to statistical software where it is usable by most researchers.

“We need to save it all, because in 10 years the algorithms will improve, and we can do a better job of extracting useful data. If you don’t save your data from past years, obviously you can never get it back.”

He told his fellow scientists that there is a need for and anticipated benefits of developing data-sharing standards, incentivizing researchers to share data, and building a data-sharing infrastructure within agricultural research.

Those needs were identified in a recent Council for Agricultural Science and Technology, CAST, publication in which Murray participated. The authors present the factors contributing to the current system of agricultural research that fosters ambivalence toward data sharing. They also describe the advantages and shortcomings of emerging data-sharing platforms, networks and repositories intended to facilitate data sharing in agriculture.

“Our ultimate goal is to advance the

continued on next page
conversation among our agricultural science partners to create a system conducive to data sharing and team science needed to address the complex, grand-challenge questions in food systems,” he said.

Murray said in his own program he is a part of the “Genomes to Fields” program, which involves 35 professors across the country growing the same genetic populations of corn and collecting the data in exactly the same way.

“We’ve evaluated over 180,000 plots as a team now, 2,500 hybrids in 162 environments,” he said. “How do you deal with that much data? First, hire a program coordinator and agree upon standards because there will be multiple terabytes of data to be dealt with very quickly.”

As an individual, Murray said, there is no way he could afford to collect that data. But with coordination, it is available and can be used in anyone’s studies on how to improve corn. This is especially true with UAS or drones that automate routine measurements such as plant height to estimate grain yield or diseases, signatures of excellence to identify the most promising varieties in the field, or to identify stress signatures for farmer management.

“But only if we know where that data is stored,” he said. “We recently made a season of UAS data and associated metadata public using the FAIR data principles. Our UAS work included 40 faculty in six colleges here at Texas A&M. How do you share and communicate that data to make sure it doesn’t get lost?”

A drone flies over a corn crop near College Station, collecting data. Storage of that data for future use is a concern needing to be addressed, according to a Texas A&M AgriLife Research breeder. (Texas A&M AgriLife Research photo by Beth Ann Luedeker)

Murray said scientists can still synthesize knowledge in journal articles, but suggested that might not be the best use of time for solving problems.

“The best use of our time might be making those data sets publicly available so people can do better and bigger studies to find the most important principles to improve agriculture, not just looking at a single environment,” he said.

This will mean collaborating with a data scientist from the beginning. It will require focus as a need and not as an afterthought. And, it will take money, Murray said.

“It will mean taking part of your research budget and putting it into communicating your data, and maybe hiring some people who can use some of the old data to make decisions. People are synthesizing data that was never designed for the experiment it was collected in. These synthesis studies will make the most reliable and impactful findings going forward.”

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Sympathies and Concerns

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

Richard Vierling and his family as they grieve the loss of his father. Dr. Vierling is the director of the AgriLife center in Vernon.

Dr. David Stelly and his family as they mourn the loss of his sister, Mrs. Mary Louise (Stelly) Niedermeier, who was killed in an automobile accident January 5.

Dr. Ben Wherley and his family as they mourn the loss of his sister who passed away Dec. 13.

Dr. Wayne Jordan and his family as they mourn the life of wife and mother, Dorothy Jordan, who passed away January 10. Dr. Jordan is a retired Soil and Crop Sciences professor.

Beth Luedeker and her family as they mourn the loss of both parents. Her dad, Storrs Warinner, passed away Dec. 13 due to complications from an infection. Her mom, Ann Cooper, passed January 22 from Parkinson’s.

The family of Roger Horn who passed away December 21. Roger was the manager of the growth chambers at the Borlaug Center.
New app development could aid crop irrigation management

By: Kay Ledbetter

Texas A&M AgriLife is developing an inexpensive and easy-to-use mobile app and irrigation management system to help agricultural producers increase water-use efficiency and continue producing cotton.

The new project is funded by the Texas A&M Water Seed Grant Initiative and is titled “A Novel Sensor- and Crop-Model-Based Decision Support Tool for Efficient Irrigation Management.”

The app is being developed in the Texas Rolling Plains region, which produces about 13% of the state’s cotton, said Srinivasulu Ale, Ph.D., Texas A&M AgriLife Research geospatial hydrologist and lead investigator on the project in Vernon.

Yet that cotton production faces challenges from recurring droughts and declining groundwater levels in the Seymour Aquifer. Furthermore, projected warmer and drier weather in the future will require larger groundwater withdrawals to meet crop water demands, Ale said.

To sustain cotton production in this region, he said, producers must adopt water-use efficient irrigation strategies.

Design & Development of mobile app

Joining Ale on the project will be Curtis Adams, Ph.D., AgriLife Research crop physiologist; Emi Kimura, Ph.D., Texas A&M AgriLife Extension Service agronomist; and Yubing Fan, Ph.D., AgriLife Research postdoctoral research associate, all in Vernon. Also, Jim Wall, Ph.D., executive director, and Keith Biggers, Ph.D., director of computing and information technology, both at the Texas A&M Center for Applied Technology, College Station, will provide expertise.

The project is partnering with the Gateway Groundwater Conservation District, Quanah, and the Rolling Plains Cotton Growers Inc., Stamford.

“Our goal is to deliver a product to cotton producers that can greatly improve their irrigation management, but is simple and accessible,” Adams said.

Most irrigation support tools have limitations that make them less useful to producers in some way, he said, and this project’s goal is to improve upon existing technologies using a novel approach.

“Our app will collect crop information from sensors mounted on center pivot systems, use weather data from online sources, and provide a number of potential combinations of real-time updated deficit- or full-irrigation schedules and economic outcomes,” Biggers said. “Producers can choose an irrigation strategy that best suits their well capacities and expected returns.”

This field information will be used in conjunction with the historic and projected short-term future weather data over the growing season in crop and economic models to estimate projected cotton yield, irrigation levels and net returns under different irrigation management strategies.

Considering short- and long-term weather forecasts

“To our knowledge, none of the existing apps use projected short-term weather forecasts in generating real-time irrigation schedules, and our proposed app does that,” Ale said.

Once validated using data from a field experiment, the proposed system will be further evaluated by selected producers under different crop conditions, soils, irrigation capacities and weather.

Wall said their plan is to have the app developed by the end of this year, test it in producers’ fields in 2021 summer, and release it in fall 2021.

Kimura estimates if producers adopt the tool on 200,000 acres of irrigated land in the Rolling Plains, it could potentially save millions of gallons of groundwater and extend the economic life of the Seymour Aquifer.

“But we don’t think its viability will be limited to the Rolling Plains,” Ale said. “We expect the proposed system to allow modifications to include other row crops and for use in other crop production regions of Texas and beyond.”
Whether on social media or in farming circles, many questions linger about glyphosate, better known as Roundup, and a link to cancer.

“It’s hard to know what to believe, but it’s important to make sure the information you receive is based on good science,” said Scott Nolte, Ph.D., Texas A&M AgriLife Extension Service state weed specialist, College Station.

Nolte addressed the issue during the Panhandle Farm Management Symposium in Amarillo recently, providing insight into the “myths and truths” surrounding the issue.

The controversy began with a ruling in 2015 by the International Agency for Research on Cancer, IARC, a subgroup of the World Health Organization tasked with determining the potential of a product to be carcinogenic. IARC indicated there was limited evidence glyphosate is carcinogenic in humans and sufficient evidence in animals.

However, because risk assessment and certain key studies were not considered by this organization, this year the U.S. Environmental Protection Agency released a statement Aug. 8 saying it would no longer approve product labels claiming glyphosate is known to cause cancer. The Agency said it is a false claim that does not meet the labeling requirements of the Federal Insecticide, Fungicide and Rodenticide Act.

**Glyphosate use and regulation**

Nolte said glyphosate has been in use since the mid-1970s and is the most studied chemical ever.

“Glyphosate, or Roundup, is a very effective herbicide that works on grasses and broadleaf weeds,” he said. “It works by inhibiting an enzyme that prevents plants from making three key amino acids needed to grow. This enzyme is not found in humans or animals, so it does not hurt them.”

Pesticides such as glyphosate are regulated by the EPA; the Food and Drug Administration, FDA; and the U.S. Department of Agriculture, USDA. These regulatory agencies determine safe residue levels and regulate tolerances.

They determine exposure risk through residue in food, water, residential use and occupational use, Nolte said. Two criteria they use are lowest observable adverse effect level and no observable adverse effect level. They set the chronic reference dose, which is an estimate of a daily oral exposure for a chronic duration to the human population that is likely to be without an appreciable risk of deleterious effects during a lifetime.

“Studies are conducted to get an observable effect and then they cut it back 100-fold to ensure if you are exposed on a daily basis to a chemical, chronic duration, it is without appreciable risk of effects during a lifetime,” he said.

**How do we know Roundup is safe?**

“Nothing is guaranteed to be 100% safe,” Nolte said. “But glyphosate is the most studied chemical in use today. None of the scientific studies have been able to definitively tie glyphosate to the cancer risks it’s been tied to.”

He said studies show the relative toxicity of glyphosate is just slightly higher than Vitamin B2 and far lower than Vitamin D3.

“Just about everything can be toxic in sufficient quantity – water, salt, organic pesticides, aspirin, caffeine, even sunscreen approved for babies – so it’s all relative,” he said. “Every day we weigh the risk with the benefits, whether it is driving to work or flying on an airplane.”

“You are responsible for good stewardship and following the label of all chemicals used,” he said. “So, handle it properly.”

Each chemical is required to have a signal word on it to determine its toxicity:
- “Danger, poison” indicates the product is highly toxic by any route into the body.
- “Danger” means it can cause severe eye damage or skin irritation.
- “Warning” indicates it is moderately toxic orally, dermally or through inhalation. Moderate eye or skin irritation.
- “Caution” means the product is slightly toxic orally, dermally or through inhalation. Slight eye or skin irritation.

“In this ranking system, only the word ‘caution’ is used on Roundup. You have to read and follow the label.”

**What does science tell us about Roundup?**

When IARC came out with their ruling on glyphosate in 2015, they knew about some additional data that would have been useful in making their decision. However, since it was not printed yet, they did not take it into consideration.

“It’s extremely challenging to talk in absolutes,” Nolte said. “There are too many things at play. But based on scientific evidence at this point, statistically, there is no tie between glyphosate and cancer. It’s usually never one thing that is involved in causing cancer, so that doesn’t mean in an individual situation where someone was predisposed to cancer that the chemical didn’t play a role.”

The piece of missing information was the Agricultural Health Study, funded by the National Cancer Institute and the National Institute of Environmental Health Sciences in collaboration with EPA.

Considered one of the largest human health studies done, it has been following people for 20 years who are chemical applicators using glyphosate or their spouses. The conclusion of this large, prospective cohort study was “no association was apparent between glyphosate and any solid tumors or lymphoid malignancies overall.”

“You can decide if it is right for you to use or not,” Nolte said. “Genetic probability likely has as much or more to do with someone getting cancer as the environment. And science tells us if we use these things properly, the risk is extremely low. The label is the law. Follow it.”
**March**

- 2-4 - Biannual Plant Resistance to Insect Symposium at CIMMYT, Texcoco
- 2-5 - Weed Science Annual Meeting, Maui, HI
- 2-5 - Turf Short Course, College Station
- 3 - Soil Conservation & Cover Crop Management Field Tour, Texas A&M Farm, College Station
- 11 - Extension Hemp Mini-seminar, 2:00 p.m. E. Travis Co. Service Ctr, Austin, TX  Contact: ctrostle@ag.tamu.edu
- 11 - Hemp Mini-seminar, 6:00 p.m. 100 Wilco Way, Georgetown, TX  Contact: ctrostle@ag.tamu.edu
- 12 - Hemp Mini-seminar, 2:30, 901 Williamson Rd., Buda, TX  Contact: ctrostle@ag.tamu.edu
- 11-13 - Offices closed for Spring Break (CS campus)
- 18 - Texas Turfgrass Assoc. Spring board meeting - Scotts blg. College Station, Tx
- 19 - Faculty Meeting, 1:30 p.m. Heep 440
- 23 - Texas Well Owner Network Program, 1:00 p.m. Bandera River Authority  Contact: j-pigg@tamu.edu
- 24 - Texas Well Owner Network Program, 1:00 Mammen Library, Bulverde  Contact: j-pigg@tamu.edu
- 24 - Organic Workshop - West Texas A&M Ag Sciences Complex, Canyon., TX  Contact: jourdan.bell@ag.tamu.edu
- 25 - Soil Crop Graduate Organization Poster Competition, College Station, TX  Contact: jmacmillan@tamu.edu
- 25 - Organic Workshop - AgriLife Center, Vernon, TX  Contact: jourdan.bell@ag.tamu.edu
- 28 - Soil & Crop Sciences FFA Agronomy Contest

**April**

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

**May**

- 2 - Doctoral Hooding Ceremony 10:00 a.m. Rudder Auditorium
- 7-9 - Commencement Ceremonies
- 8 - Healthy Lawns Healthy Waters workshop, Mont Belvieu  Contact: johnwsmith@tamu.edu
- 9 - Healthy Lawns Healthy Waters Workshop, The Woodlands  Contact: johnwsmith@tamu.edu
- 13 - P&T meeting - Mid Term (if needed)
- 20-21 - McFadden Symposium, Manhattan, KS
- 25 - Memorial Day Holiday (CS campus)
- 27 - Septic System Workshop, Brenham, TX  Contact: wling@tamu.edu
- 27 - Healthy Lawns Healthy Waters Workshop, Gatesville, TX  Contact: johnwsmith@tamu.edu
- 28 - Healthy Lawns Healthy Waters Workshop, Lampasas, TX  Contact: johnwsmith@tamu.edu

**June**

- June 6 - Stiles Farm Field Day, Thrall, TX
- June 30 - Annual Eagle Lake Rice Field Day
- July 9 - Annual Beaumont Rice Field Day
- July 19-21 - Texas Turfgrass Assoc. Summer Conference, Horseshoe Bay, TX