The Munson family was among those who enjoyed the opening weekend of the Fighting Texas Aggie Corn Maze. More information can be found on page 7.
Recent crisp mornings and harvested fields make it officially feel like fall. Researchers are beginning to move out of the fields and into the labs. Winter forages are being planted, and now wait for rain. It is hard to believe that while areas of the state are still digging out from the disastrous effects of hurricane Harvey, others are concerned by the lack of moisture in their soil.

As fall settles in, outdoor field days give way to the indoor conferences. October has been busy with the Turfgrass and Landscape Field Day, the Bushland Forage Field Day, Bennett Women’s Land Stewardship Conference, the fall Ranch Management University and the Surface Mine Reclamation workshop. The World Food Prize/Borlaug Dialog International Symposium is next, followed by the Tri-Society meetings in Tampa.

We invite all to join us for our Soil and Crop Sciences Mixer at ASA. It will be Tuesday, October 24, 5:30 to 7:30 at Ferg’s Live, 490 Channelside Drive. This is just a six minute walk from the Tampa convention center. We hope to see many of you there.

Congratulations to our soils judging team for their recent victory at the regional competition in San Marcos. They have earned the opportunity to compete at the national competition in Tennessee next spring. Kudos to Nicole Shigley, high scoring individual; Cooper Stence, 5th high; and Kenny Le, 7th high, for their outstanding individual efforts.

Congratulations also to the faculty and students who will be receiving awards at the Tri-Society meetings in Tampa. We will have more information and photos from that event in the November issue of the Aggie Agenda.

Our search continues to fill the Soil Carbon and Turfgrass positions here in College Station, as well as the Extension Turfgrass position in Dallas. Information on those positions may be found on our website under the Opportunities tab. We are in the process of refilling positions in our business and teaching offices, and hope to be fully staffed soon.

Harvest continues for many, with new data being collected by our researchers. Each year helps us answer some questions, while raising others. Researchers continue to look at conventional and unconventional methods to grow the food needed to feed our global neighborhood. Research into organic farming aims to make this option more profitable for producers (see article inside).

Our 3rd Annual Agronomy Corn Maze is up and running. Once again excessive rains created problems, but the students and faculty rallied to make things work. This event is fun for the community, but is also a great learning tool for the involved students. The maze is open Saturdays and Sundays (Friday and Sunday on Aggie home football weekends) through November 5. We hope you can find time to come out and join us.
Dr. Amir Ibrahim received the Dean's Outstanding Achievement Award for International Impact from Dr. Mark Hussey at the awards ceremony in September. Ibrahim’s specialty is wheat breeding and genetics. He has been instrumental in a collaboration between Texas A&M and wheat breeders in Tunisia. He was also recognized as an AgriLife Advanced Leadership Program Cohort IV.

Dr. Muthu Bagavathiannan received the Dean’s Outstanding Achievement Award for Early Career Research from Dr. Mark Hussey at the awards ceremony in September. Bagavathiannan is an assistant professor whose specialty is weed science and agronomy. His research focus is on weed ecology and management, primarily aimed at understanding the evolutionary biology and dynamics of herbicide resistance and developing integrated pest management solutions encompassing chemical and non-chemical tactics to prevent or effectively manage herbicide resistance.

Judy Young received the Dean's Outstanding Achievement Award for Staff from Dr. Mark Hussey at the awards ceremony in September. Young is the Senior Administrative Coordinator for the Department of Soil and Crop Sciences. She serves as the personal assistant to the department head.
AgriLife Extension and the USDA Natural Resource Conservation Service recently teamed up to discuss cover crops and conservation tillage practices with producers in the Blackland region of the state. The group met at the Stiles Foundation Farm, near Thrall, and Unnasch Farms, near Hart, Texas.

Robert Unnasch has been practicing conservation tillage for many years. This made the field trip to his farm an excellent way to begin the day, according to the field day organizers.

“When a farmer talks, people listen,” said Nathan Haile of the NRCS. “Robert Unnasch has been doing this successfully for some time, so he has experience worth talking about.”

Haile pointed out that, according to the NRCS, there are 5 key elements for ‘soil health’ which are met by conservation tillage/cover crop practices: maintaining ground coverage; minimizing disturbances; maximizing diversity; maintaining growth year-round; and integrating livestock to redistribute nutrients.

“Cover crops should be planted as closely together as possible to aid in weed constriction, and to provide canopy to protect the soil,” said Dr. Haly Neely, Texas A&M University Soil and Crop Sciences faculty.

“If you close the canopy you reduce sunlight on the ground and air across the soil, keeping the soil cooler and drastically reducing evaporation,” she said.

Minimizing disturbances means leaving the soil alone as much as possible. Under conservation tillage practices, equipment enters the field much less frequently.

“Every time you till the soil you set it back in terms of organic matter and soil bio-ecology. Not all the way to zero, but back to the minimum that soil will support,” said Dr. Jake Mowrer, Assistant Professor in the Department of Soil and Crop Sciences and Texas A&M AgriLife Extension Specialist for soil nutrient and water resource management. “Any time you disrupt the continuity of the soil it takes time to recover.”

Crop diversity provides many benefits, Haile said, and can improve pest and weed management in the field.

“Having different rooting systems keep root channels open,” said Mowrer. “The plants take up different nutrients and may redistribute them to different zones in the soil where they are more accessible to the successive crops.”

But think carefully about the benefit desired from a cover crop before selecting a species, says Mowrer. For example, to add nitrogen to the soil, plant legumes; to redistribute nutrients, plant cereals; to restore soil organic matter, plant something with a high biomass, he said. In addition, a farmer must select a crop which will work well in his soil.

“Keep something growing for as much of the year as you can,” Mowrer said. “If you don’t have a living root in the system you are missing something.”

Mowrer explained that most of what is known about cover crops comes from the corn/soybean rotations in the Midwest. It is important to gain information about what works in Texas to best aid the farmers here, so AgriLife researchers have several projects underway out at the Stiles Farm Foundation.

One ongoing project was discussed by Dr. Clark Neely, Assistant Professor in Soil and Crop Sciences and AgriLife Extension Small Grains/Oilseeds Specialist. His research is studying the feasibility of double cropping/cover cropping and reduced tillage in wheat cropping systems.

“We are looking at several double cropping options including grain sorghum, sesame, and cowpea. We also have a nine-species cover crop mixture. The thought behind double-cropping is to see if we can get the same soil benefits as a multi-species crop mixture and also generate some additional farm revenue at the same time,” Neely said.

“The tillage component of the study compares conventional, strip-till and no-till systems,” he explained. “In addition to the soil health aspect of reduced tillage, we wanted to evaluate these double crops and cover crop mixture under each tillage

continued on next page
system to see if strip or no-till made double cropping more feasible or reliable by conserving more soil moisture. We’ve found that strip or no-tilling double crops following wheat harvest does improve stands and ultimately yields due to greater soil moisture in the topsoil at planting.”

Based on preliminary results, sesame appears to have the best potential for generating a viable income followed by grain sorghum, Neely said. Another important finding so far is that these double crops are not having a negative impact on wheat yields, despite using more soil moisture during the summer months. The Blacklands region generally receives enough rainfall to recharge soil moisture by the time wheat is planted later in the fall.

“We are taking soil measurements on wet aggregate stability, soil infiltration rate and soil respiration, which can serve as indicators of overall soil health, but observable differences will likely take more time,” Neely said.

He and his colleagues will determine the profitability of the system through economic analysis after more years of data are collected.

Aggie Corn Maze 2017

The Aggie Corn Maze is up and running! They will be open Fridays 5:00 - 8:00 p.m. and Sundays, 10:00 a.m. - 6:00 p.m. until November 5, with a special Halloween maze on October 31 from 5:00 - 10:00

“The Halloween maze will be kid friendly until about 7:30, but will be scary later in the evening,” said Nicole Shigley, one of the maze organizers.

The Texas A&M Agronomy Society students sponsor the maze, and are responsible for every aspect from planning to planting to cutting the paths to greeting the public.

In addition to the maze, there is a cotton patch, a pumpkin patch, pumpkin decorating, and other activities.

More information may be found on the Texas A&M Agronomy Society Facebook page.
Managing wheat streak mosaic virus across the Great Plains

By: Kay Ledbetter

Researchers estimate between $60 to $400 in yield losses per acre occur in the Texas High Plains alone due to wheat streak mosaic virus or WSMV infection. But the losses go far beyond the borders of Texas. In the Great Plains, one of the largest wheat regions in the nation, and other parts of the world, WSMV is one of the most important biotic stresses affecting wheat (Triticum aestivum L.) productivity. The virus has been found in all major wheat-growing regions of the world.

Cultural control is not very effective because the wind can spread the wheat curl mites, which vector the devastating disease, said Dr. Shuyu Liu, Texas A&M AgriLife Research small grains geneticist in Amarillo. And there is no effective chemical treatment available for the disease. The most cost-effective and environmentally safe approach for combating this disease is host resistance.

 BREEDING FOR A CURE

Breeding for wheat cultivars with resistance provides a socioeconomic and environmentally sustainable approach for combating WSMV. The use of markers as a proxy for quantitative and qualitative traits is widely applied in crop improvement programs. Among the available markers, single nucleotide polymorphisms (SNPs) are routinely used in plant breeding programs to distinguish potentially superior genotypes with genetic merit for traits of interest.

The wheat genetics research team at Amarillo led by Liu outlined how the better control will come through genetics in three papers published in Crop Science – “Wheat Curl Mite Resistance in Hard Winter Wheat in the U.S. Great Plains,” “Saturated Genetic Mapping of Wheat Streak Mosaic Virus Resistance Gene Wsm2 in Wheat” and “Development and Validation of KASP Markers for Wheat Streak Mosaic Virus Resistance Gene Wsm2.”

Three closely linked kompetitive allele specific PCR (KASP) SNPs were identified as being effective in differentiating resistant and susceptible genotypes. Comparative mapping was performed using sequences of SNPs flanking Wsm2 and identified candidate genes and regions in Brachypodium and rice. The KASP SNPs developed in this study should be useful for marker-assisted selection of Wsm2 in wheat breeding programs, and the newly constructed map will also facilitate map-based cloning of Wsm2.

In the second paper, Liu said they were able to locate the Wsm2 gene onto the chromosome 3BS with 90K SNPs and validate the gene in two populations derived from RonL and Snowmass and validate the KASP markers in six F2 breeding populations for marker-assisted selection for this gene. However, breeders have to be careful when they apply these markers as they will not work in some genetic backgrounds.

 TAM SOLUTIONS

TAM 112 is a popular cultivar for its drought tolerance and has been identified by the Texas A&M wheat breeding program as having resistance to wheat curl mite and wheat streak mosaic virus under field conditions.

The researchers identified two Texas collections of wheat curl mite. All wheat lines with 1AL.1RS translocation are resistant to the collection 1 but susceptible to Texas collection 2. However, the resistance gene from Aegelops tauschii PI268210 that was transferred into TAM 112 and TAM 204 is resistant to the Texas collection 2, which exists in Kansas and Nebraska and is correlated to Australian type 1 of mite. This gene in a cultivar can provide very good protection when the mites are epidemic.

Through the newly developed protocol, Liu’s team determined that TAM 112 and its derived lines, including TAM 204, Byrd and Avery, have the resistance gene from Aegelops tauschii, an annual goatgrass that is an ancestor of bread wheat.
Organic wheat and beef may not be for everyone, but one Texas A&M AgriLife team is going to make sure producers in Texas know more about the possibilities than they currently do.

Dr. Curtis Adams, Texas A&M AgriLife Research crop physiologist at Vernon, will lead a new project funded by the U.S. Department of Agriculture’s National Institute of Food and Agriculture in the Organic Transition Program.

“Introducing Organic to Producers of Grain-Only and Dual-Purpose Wheat Cropping Systems of Northern Texas” is an integrated grant project that includes research, Extension and education components, Adams said.

“We’re very excited about this project because we expect that it will open doors to producers that haven’t been available before,” he said.

“Many producers have seen organic agriculture as a complicated process with a lot of challenges, but we hope to make the process simpler.”

“While this region is nationally recognized for its wheat production and stocker cattle wheat grazing systems, there is virtually no organic agriculture here,” Adams said, estimating there were only about 10 farms certified as organic in this area.

Collaborators include Dr. Bill Pinckah, AgriLife Research animal nutritionist in Vernon; fellow soil and crop sciences department personnel Dr. Emi Kimura and Dr. Jourdan Bell, both AgriLife Extension agronomists in Vernon and Amarillo, respectively; Dr. Seong Park, AgriLife Research economist in Vernon; and Dr. Anil Somenahally, AgriLife Research soil microbiologist in Overton.

“Organic is one of the fastest growing areas of agriculture in terms of consumption,” Adams said. “But Texas has not taken advantage of the growth in that sector like other states have.”

He said suppliers of organic wheat and organic beef are having a hard time finding adequate supplies to meet their demand. One company, Ardent Mills of Colorado, has indicated it would source organic wheat products across a large region that includes Texas, but hasn’t been able to get much supply from this state.

“Arden Mills is running a private initiative to increase organic wheat production in this region, offering some incentives to producers, and we have teamed up to help connect them with producers in Texas,” Adams said.

Adams said his cropping system research will begin with a cover crop in spring 2018 and take place on 100 acres of AgriLife Research’s Smith-Walker ranch 10 miles south of Vernon.

“In the research, transitional organic systems will be directly compared to conventional systems,” he said.

“Organic management will include application of composted manure and summer cover crops to supply fertility, crop rotation, tillage and cultural practices to control weeds. The conventional side will include summer fallow, the use of synthetic fertilizers, tillage and chemical weed control.

“Since the research has both grain-only and grazing components, we wanted the experiment to occur on a large field scale, which is the only way to provide results directly transferable to producers,” Adams said. “We will be able to tell producers how all management aspects come together to affect yield, animal gains, the soil and their bottom line.”

One of the problems, he explained, is once a producer cuts off the use of chemicals, there is a three-year transition period before the farm can be certified as organic. This has been a barrier to adoption of organic agriculture because it is risky for a producer. The lower-input organic scenario could decrease yields, but the producer can’t realize the organic price premium for three years.

“The research portion of the project has been designed to generate data that will clarify the benefits and risks to producers during and following the organic transition period,” Adams said.

“We will also look at the soil and microbiology shifts in response to organic management practices to give us some understanding of the health of the system and its environmental impact,” Adams said.

“We know organic is not for everyone,” he said. “But we want to bring information to the table and let producers make decisions themselves.”

The educational component of the project will be directed toward regional higher education. Team members Kimura and Bell will work with Michael Schoppa at Vernon College in Vernon and Dr. Brock Blaser at West Texas A&M University in Canyon to develop a curriculum section on organic agriculture.

“This will help give students in the region a more comprehensive look at agriculture to include organics,” Adams said.
During his senior year as a Plant and Soil Science student (with a minor in Horticulture) at Texas A&M University, Ryan Tomlin ’16 learned of an opportunity to help teach agriculture to youths in developing countries.

After earning his Bachelor of Science in 2016, Tomlin accepted a job as an agronomist with Robinson Fresh, but continued to think about Africa. This summer he chose to join AgriCorps and spend a year encouraging youth and helping them learn to feed their growing nation through improved agricultural practices.

Founded in 2013 by Texas rancher Trent McKnight, AgriCorps is a non-profit organization focused on reducing hunger and poverty in developing countries through agriculture education. According to their website, the Corps Fellows serve ten to eleven month assignments in a developing country attached to the agriculture program at a junior or senior high school. Fellows receive a stipend equal to that of a local teacher, about $200 per month.

Tomlin's journey started in August with several weeks of training in Throckmorton, Texas, followed by several more weeks in Koforidua, Ghana. From there he headed north to Mensah Dawa, a small community in the mountains near Asesawa and Lake Volta, where he will spend the next ten to twelve months.

“I live on my own, in a house provided by the community,” Tomlin said via email. “The house sits up against the forest/bush. I occasionally have electricity in one room; however, my source of water is a quarter of a mile away. It is a humble living situation, and I have grown to love it.”

In Mensah Dawa, about 75 percent of the population is involved in farming. Tomlin has found that one of his greatest challenges will be to change the community's perception of the farmer from someone who is poor, to someone in an honorable and profitable profession.

Similar to early Extension efforts in Texas, Tomlin's primary focus is on the young people. He is teaching Agriculture Science in the junior high school three days per week, with students ranging in age from 12 to 18. Mondays and Wednesdays he visits farmers and nearby 4-H clubs.

Tomlin feels that the community elders and Dadematse (chief) are extremely supportive and excited for what will transpire during his year there.

Mr. Appiah, a community elder, gave the students an acre of land on which to farm. In early October, Tomlin and his students cleared the land by hand, built vegetable beds and planted a variety of crops. He hopes to stimulate their interest by experimenting with intercropping and crop rotation.

“I also plan to use this site as a tool and visual for extension, where local farmers can learn more about different cropping systems,” said Tomlin.

In Mensah Dawa the primary crops are cassava, corn and cocoyam (taro). Tomlin is helping the local farmers start vegetable plots and begin cocoa production.

“Typically, farmers have small plots ranging from one to ten acres in which corn follows corn,” he said. “I hope to introduce a bean (legume), corn, cassava rotation and to motivate farmers to have small vegetable plots where they can grow higher value crops.”

Tomlin has also begun collaborating with Ed Sawodgi, the Ministry of Food and Agriculture Extension Agent in Asesawa.

“At times it is overwhelming and difficult to process everything happening around me,” Tomlin said. “I have learned that a key factor in the success of my journey is to take everything one step at a time.”

The students build raised beds where they will plant vegetables. Inset - the land before clearing.
Texas A&M AgriLife officials are offering some best management practices for producers to keep in mind as harvest continues and for next year after fumonisin contamination has been found in truckloads of corn across the Texas High Plains.

Dr. Tom Isakeit, Texas A&M AgriLife Extension Service plant pathologist in College Station, said this year nothing can be done to minimize fumonisin already present in the standing crop; however, producers can make a few changes during harvest to possibly reduce the amount of contaminated grain collected.

“You can adjust the combine settings to kick out the smaller grain kernels that tend to have much higher levels of contamination of fumonisin,” Isakeit said.

Fumonisin toxin is produced when certain Fusarium fungi are present on the corn, although not all Fusarium-infected kernels will have fumonisin, he said. The only way to know if the toxin is present is to have a chemical test run.

But there are visible symptoms of the fungal infection, including a white discoloration of the kernels, and when they dry down they will be smaller or lighter than the healthy kernels, Isakeit said.

The severity can be lessened by cleaning the seed or separating the damaged kernels out, he said. Sometimes just a few kernels can cause the higher concentrations. And though it is not done much in Texas, artificially drying the corn from a high moisture of 24 percent to 15 percent in a 24-hour period can also minimize contamination. Optimum levels of fumonisin production occur between 18-20 percent moisture.

Also, producers should segregate portions of the field if there was moisture stress, keeping corn from the drought-stressed areas of the field separate from the rest of the field, Isakeit said.

He also warned that putting corn into storage won’t get rid of the fumonisin contamination, but high levels of moisture or some leakage after placement in bins can add to the problem.

“For storage, you want to have your corn dry and keep it dry,” he said. “Make sure the bins are operated properly and are well ventilated.”

Beyond this year, Isakeit and Dr. Wenwei Xu, Texas A&M AgriLife Research corn breeder in Lubbock, offered some management practices that could help possibly control the problem in the future.

Both said there is no product available that can be applied to prevent fumonisin, so minimizing the contamination in the future will require a combination of hybrid selection and cultural practices.

Xu said there is a clear difference in terms of Fusarium fungus infection among hybrids, and there is a clear difference in terms of susceptibility to common smut. Resistance to Fusarium fungus disease, common smut and earworm damage are all factors that should play into hybrid selection, he said.

“If a hybrid is susceptible to these, it doesn’t mean every field will be severe, but it can be elevated in bad years and the kernel damage under different environmental conditions can lead to more contamination,” Xu said.

“Based on my observations and conversations with farmers, you can find the problem in both dryland and irrigated corn and short-season to full-season corn,” he said. “It varies from field to field, and the hybrid, growth management, hot temperatures and drought stress will determine the severity.

“Farmers need to be paying attention to the factors that contributed to high fumonisin contamination this year when selecting their hybrid next year,” Xu said.

Hybrids less prone to loss of kernel integrity should be planted, Isakeit said.

Insect resistance, including that in transgenic hybrids, can help reduce contamination by reducing wounds in the kernels that allow entry of the fungus.

Also, he said other factors in fumonisin contamination are the common smut disease, which can act as a sponge and retains moisture in the ear, allowing the Fusarium fungus to grow and produce toxin; and hybrids with ears that remain standing instead of falling at maturity, which retains moisture and prevents the ear from drying down.

Some other crop management strategies he outlined are:
– Control weeds to reduce moisture stress.
– Optimize irrigation to avoid stress between flowering and grain fill.
– Maintain optimal nitrogen fertility, especially with high plant populations.

For more information, go to http://aflatoxin.tamu.edu/ or http://www.cornmycotoxins.com.
Topics ranging from management of sand-capping systems on golf courses to turfgrass cultivars of the future attracted more than 150 people to the Texas A&M Turfgrass and Landscape Field Day on Oct. 11 in College Station.

The event was hosted by the Texas A&M AgriLife Research and Texas A&M AgriLife Extension Service programs within Texas A&M University’s soil and crop sciences department.

Attendees were lawn care operators, golf course superintendents, landscapers, sod producers and professional grounds managers from as far away as Dallas and San Angelo, said Dr. Ben Wherley, associate professor of turfgrass ecology with AgriLife Research and coordinator of the program.

"Attendees gained new information that they will be able to take back and directly apply to improve their turf and landscape management practices," Wherley said.

“What a great job on a field day that helped showcase new technology to the Texas green industry,” said Dr. Mark Hussey, Texas A&M University System vice chancellor and dean of agriculture. “I’m extremely excited to be here in the new home for the turfgrass science program, the Scott’s Miracle-Gro Center for Lawn and Garden Research. This facility highlights our strong partnership with industry, plus provides an excellent location for us to conduct research, extension and education here at the institution.”

Hussey said all the research, teaching and extension work at the facility is having a great impact on the green industry, not only in Texas but nationally and internationally through the reach of Texas A&M programs.

“These are really exciting times in the green industry and the urban-types of programs within the Texas A&M University System,” he said during the field day luncheon. “We have this great facility where you are able to see some of the research showcased here today. And, at our Dallas location on Coit Road, we are in the process of constructing a new urban research and extension facility that, even by Texas standards, will be best in class.”

“Here’s what we’ve also developed a new AgriLife Turf Pest Management Guide, which is a comprehensive resource for understanding and selecting herbicides, insecticides and fungicides for use on Texas turf,” Hussey said.

Additionally, he talked about the redeveloped Aggie Turf website, http://aggieturf.tamu.edu, which is intended as a comprehensive site for turfgrass selection and management, as well as providing links to other resources.

“The bottom line is you can see these are exciting times and we have a tremendous amount of momentum here within the Texas A&M University System, all focused on doing a better job of discovering and educating, delivering the latest technology to our state and being a resource to help each of you as you go through your professions,” Hussey said.

Hussey also recognized Kent Potts and his family for their philanthropy in establishing the R.C. Potts Endowment to help support Texas A&M’s research, teaching and extension student opportunities.

“These endowments provide us with that margin of excellence we need in our programs,” he said. “I know the family will appreciate if others step forward and contribute to this endowment going forward. As we think about the Texas turf industry and urban agriculture, it is something that will continue to make a tremendous impact going forward.

“Hundreds, maybe even thousands, of students will tell you the reason they came and the reason they were able to stay at this institution is because of R.C. Potts,” Hussey said.
Scattered bones found outside the Heep Center this month, were quickly surrounded with crime scene tape to prevent disturbance of the evidence. The “crime scene” was part of an ongoing investigation in the Forensic Soil Science class taught by Dr. Jacqui Aitkenhead-Peterson.

Forensic Soil Science (FIVS/SCSC 401) teaches soil science applicable to forensic science. Students learn to assess soil color, particle size analyses, particle shapes and size, the natural assemblages of soil (physical, biological and chemical) and unusual anthropogenic assemblages that might be found in a soil sample.

A major part of the course is the “Muddy Boots” case,” a fictitious scenario in which a graduate student is reported missing. Each student provides a soil sample from their “alibi location” during the summer, collected to a depth of 2.54 - 5.00 cm. 3 sets of footwear are also “retrieved”, each containing either alibi soil, reference soil or crime scene soil.

“One objective is for the students to see how soils from across the nation differ, and the discriminatory power of soil chemistry to match one of the pairs of boots to the crime scene,” Peterson said.

When the scattered remains appear outside the Heep Center, the students process the scene in the same manner as taught to Law Enforcement at the Sam Houston State University Donor facility. They first create a grid over the area, and then collect and record evidence in each grid, including soil samples taken to a depth of 2.54 cm for comparison to the “muddy boots”.

Increased electrical conductivity is an indication of decomposition. Where this is noted, the students collect a 15 cm soil core as evidence. Peterson explained that 15 cm is the depth most useful for estimating post-mortem interval.

“All soils collected will be used for further chemical analyses along with statistical analyses to determine which pair of muddy boots was at the crime scene,” said Peterson.

Students collect evidence from vehicles during a subsequent lab which is also used to solve this case.
When producers showed up to the annual Texas A&M AgriLife Extension Service forage sorghum silage tour near Bushland, little did they know they would be getting a muffin and a nutrition education.

Dr. Jourdan Bell, AgriLife Extension agronomist in Amarillo, added Lizabeth Gresham, AgriLife Extension family and consumer sciences agent for Potter County, to her annual tour lineup this year in an effort to link agriculture and human health and diet.

The 2017 AgriLife Bushland Forage Sorghum Silage trial includes 78 forage sorghums, sorghum-sudangrasses and grain sorghum hybrids grown for livestock production. However, Bell said, it also provided the opportunity to discuss the value of food-grade sorghum hybrids in the human diet.

“We wanted to look at sorghum use from both sides; while this field trial is targeting the livestock industry and silage production for both beef cattle and dairies, we also recognize there is a human component,” she said.

“We need to look at sorghum for the human diet as well as the animal diet. And, if farmers know there are additional marketing opportunities, maybe they can tap into something that offers a premium.”

With many producers and seed industry representatives present, Bell said the tour was an opportunity to address the human aspect, provide education and emphasize that AgriLife Extension realizes sorghum is a part of a healthy diet and there is an opportunity to direct it into alternative markets.

“This is part of the Path to the Plate program, which is a new statewide research-based educational program to improve agriculture literacy with consumers,” she said. “It is important for consumers to understand how food is produced as well as how to prepare healthy foods in order to lead healthier lives.”

Select AgriLife Extension county agents across the state were trained as Path to the Plate Champions, and will be training other county agent.

“Lizabeth is one of the Champions,” Bell said. “When you look at how important nutrition is to health and minimizing chronic diseases, it is important for us to educate consumers about healthy food choices. Lizabeth is focusing on sorghum in the diet, and promoting it as a healthy grain to consumers.

“It was wonderful for Lizabeth to participate in our plot tour. While the program objective is not to target producers, we recognize agricultural producers are also consumers,” Bell said. “At the tour, it was interesting to see how many people directly involved in agriculture and grain sorghum production had not even tasted sorghum.”

Gresham said she wants to emphasize the importance of nutrition and whole grains in the diet, including sorghum. She developed a sorghum banana muffin recipe for the producers to taste. As producers of sorghum, she said, it’s important for them to not only know how to grow it but also how it tastes as well as about its nutritional benefits.

“It only makes sense for us to work as a team and be educated on the nutritional benefits and taste of sorghum,” she said. “I am able to offer cooking and tasting opportunities and emphasize sorghum’s exceptional whole grain nutrition. Sorghum is an excellent choice in whole grains because it is packed full of healthy nutrients. It’s extremely high in protein and fiber.”

“Sorghum is a naturally gluten-free whole grain, which is important right now in the food industry,” she said. “It is a great product for those with celiac disease or gluten sensitivity.”

Ultimately, education is the key to help market and use the grain, she said, including the use of sorghum in recipes.

“It can be a little tricky at first to bake with sorghum due to the lack of gluten but only a few tips are needed,” Gresham said. “I can add support, helping to educate on baking techniques and cooking methods to add taste, flavor and texture that consumers are accustomed to.”

She said sorghum provides a mild nutty flavor that pairs well with all spices and can be used in both savory and sweet dishes. Sorghum grain has a similar consistency to rice and can be used to prepare many meals and side dishes. She added sorghum is versatile and can be served in many ways. It can be used in soups, salads, stews and even popped like popcorn. When cooked, sorghum will double to triple in size and becomes tender.

Sorghum takes slightly longer to cook than other grains but it can be cooked in a pressure cooker to reduce cooking time or prepared ahead and refrigerated or frozen for later use, she said.

“Just add it to your stews, beans and salads. It can be eaten warm or cold,” Gresham said. “Sorghum provides health benefits that make it a worthy addition to any diet. Fuel your body with sorghum and add an important plant-based protein, a great source of dietary fiber as well as minerals like phosphorus, potassium and iron.”

Visit Texas Sorghum Association on 10 reasons to try sorghum, which can be found at http://www.simplysorghum.com/nutrition/.
Watershed partnership to hold Low-Impact Development Workshop

By: Paul Schattenberg

The Geronimo and Alligator Creeks Watershed Partnership will hold a Low-Impact Development Workshop from 8:30 a.m.-4 p.m. Nov. 1 at the Irma Lewis Seguin Outdoor Learning Center, 1865 U.S. Highway 90 E. in Seguin.

The workshop is free and lunch is included. It is hosted by the Texas A&M AgriLife Extension Service and Guadalupe-Blanco River Authority. Registration begins at 8 a.m.

“The goal of the workshop is to better equip decision makers and the public to understand and consider the impacts of nonpoint source pollution in their daily activities,” said Ward Ling, AgriLife Extension program specialist in soil and crop sciences, College Station.

Ling said Dr. Fouad Jaber, AgriLife Extension specialist in integrated water resources management based in Dallas, will be among the presenters and explain how different smart-growth techniques can help mitigate the harmful effects of urbanization on stormwater volume and water quality.

“There will be a combination of in-class presentations and outdoor demonstrations,” Ling said. “Seven hours of American Institute of Certified Planner credits will be available to those attending.”

A Clean Water Act grant was provided to AgriLife Extension by the Texas State Soil and Water Conservation Board and the U.S. Environmental Protection Agency to implement the Geronimo and Alligator Creeks Watershed Protection Plan, Ling explained.

“This workshop is part of the implementation of that plan,” he said. For more information on the plan, go to http://www.geronimocreek.org.

The workshop agenda includes the following topics and activities:

— Linkages between land use, water quality and community character.
— Reducing stormwater runoff volume and improving water quality through use of low-impact development structures and techniques, such as permeable pavement, rain gardens, vegetated swales, “curbless” streets and means to improve flood control.
— A site tour featuring a rainwater harvesting system, two types of permeable pavement, a rain garden and a vegetated swale. There also will be a tour of a turfgrass demonstration area showing St. Augustine, Bermuda, zoysia and buffalo grasses as well as an example of xeriscaping.

Attendees must register to reserve a seat. To register and for more information, contact Ling at 979-845-6980 or wling@tamu.edu.

Rain gardens are among the low-impact development features that can be used to stem runoff and nonpoint source pollution. (Texas A&M AgriLife photo)

Riparian, stream ecosystem workshop set Nov. 8 in Brenham

By: Paul Schattenberg

BRENHAM — The Texas Water Resources Institute’s Texas Riparian and Stream Ecosystem Education Program will host a free workshop from 8 a.m.-4 p.m. Nov. 8 in Brenham for area residents interested in land and water stewardship in the Mill Creek watershed.

The morning session will be at the Washington County Fairgrounds Sales Facility, 1305 E. Blue Bell Road. The afternoon session will include a walk and presentations along Mill Creek.

Clare Entwistle, research associate at the institute’s San Antonio office, said the workshop is co-hosted locally by the Mill Creek Watershed Partnership and the Texas A&M AgriLife Extension Service in Washington County.

Attendees must RSVP by Oct. 26 to Entwistle at 210-277-0292, ext.110, or clare.entwistle@ag.tamu.edu. She may also be contacted at http://bit.ly/2gvDggH.

Entwistle said, “The goal of the workshop is for participants to better understand riparian and watershed processes, the benefits of healthy riparian areas and what resources are available to prevent degradation while improving water quality.”

“Stakeholders recognize successful implementation of a watershed protection plan requires implementing a variety of management strategies,” said Jennifer Cary, AgriLife Extension specialist and Mill Creek watershed coordinator, College Station. “The riparian and stream workshop is an educational event supporting this effort.”

A riparian workshop related to Mill Creek will be held Nov. 8 in Brenham. (Photo courtesy Jennifer Cary)
Winter forages can reduce costs and boost cow/calf weight gains

Planting successful winter forage pastures can reduce supplemental feed costs and boost cow/calf weight gains, said Texas A&M AgriLife Extension Service experts.

Dr. Vanessa Corriher-Olson, AgriLife Extension forage specialist, and Dr. Jason Banta, AgriLife Extension beef cattle specialist, both in Overton, said following recommended practices regarding winter pastures can improve producers’ bottom line.

Corriher-Olson said producers have several winter forage options for grazing, including annual ryegrasses and small grains, such as oats, wheat and rye. Producers should choose the plant species and variety based on the region, annual rainfall, soil type, production needs and when the forage needs to be available for the herd.

Annual rainfall and soil type in each specific Texas region will be a major factor in deciding which forage will successfully meet grazing needs, she said. For example, annual ryegrasses are historically more popular east of Interstate 35 due to rainfall and because varieties are well adapted to a variety of soil types.

Soil tests and preparing the soil for specific varieties are critical, she said. Drainage, whether the site drains well or collects water, will also impact production success.

Corriher-Olson said producers should plant seeds at recommended depths. Annual ryegrass should not be planted deeper than half an inch. Small grains should be planted at least an inch deep.

“Seed depth is critical for germination and ultimately success,” she said.

Proper fertilization will greatly impact production, she said. Nitrogen is important for small grain and ryegrass production. Potassium and phosphorous are important for all forages.

“So be sure to follow soil test recommendations,” she said.

Timing requirements are also an important consideration for producers, she said.

“Even though we call them winter forages and there will be some growth in fall and early winter, the majority of growth will be in the spring, February to April for small grains and February to May for ryegrasses,” she said. “For example, annual ryegrasses provide some production in the fall and early winter, but the months of February through May are when there is a major boost in production.”

Banta said winter forages are a cost-effective way to provide grazing and add pounds to fall-born calves.

“For example, if we figure ryegrass is $15-$18 an acre in seed cost and we budget $90 per acre in fertilizer then our cost per ton of forage produced would be about $25-$55,” he said. “Costs will vary depending on forage yield and fertilizer need, but that’s considerably cheaper than hay and most other winter feeding programs.

“If done right, winter forages can eliminate the need for supplemental feeding and provide good protein and energy to cow/calf pairs during critical periods,” he said.

Banta said the decision of how many planted acres producers should provide per cow or cow/calf pair depends on timing. A good guideline to follow is to plant approximately 1 acre for every two to three spring calving cows and 1 acre for each cow/calf pair when calving in the fall, he said.

Banta said calving schedules are a critical consideration for utilizing planted forages effectively.

Fall calving pairs can graze full-time if the forage allows, he said. If cows are in the last trimester before calving, producers should limit cows’ access to winter pasture.

“You’ll want to limit grazing for those cows to two hours a day,” he said. “The reason we want to limit grazing is because there is so much protein and energy in the forages that we could see increased birth weights and potential calving problems.”
Just how much water are weeds using in a corn crop, and is it more economical to treat or not is the focus of a Texas A&M AgriLife study.

Dr. Jourdan Bell, Texas A&M AgriLife Extension Service agronomist in Amarillo, and her Texas A&M AgriLife Research graduate student Aislinn Walton have found in early results heavy weed pressure could result in a 100-bushels-per acre yield loss on a corn crop.

As groundwater becomes increasingly limited, Panhandle producers are often not able to meet the crop’s full water demands, Bell said. Timely weed management can actually save water and improve yields because weeds are using the crop’s water and nutrients.

“We sometimes see producers miss their preplant herbicide applications and not control weeds until later in the season,” she said. “But our research validates that they have lost a significant portion of their yield potential to early weed pressure. We have seen yield losses of up to 300 percent in our corn herbicide research plots with heavy weed pressure in comparison to plots with good weed control.”

Bell said as they monitored their herbicide plots, “we really began to question how resources were being allocated to weeds, specifically water, so we purposely planted weed plots with kochia, redroot pigweed, morning glory, velvet leaf and barnyardgrass to evaluate weed water use.”

Last year, Walton began monitoring crop water use in corn herbicide research plots with neutron moisture probes. The measured crop water use is actually the evapotranspiration, which is soil evaporation and crop transpiration combined.

“While we have been able to show there is significantly more evapotranspiration in plots with heavy weed pressure, we really don’t know how much water or transpiration is coming from just the weeds,” Bell said. “A farmer trying to determine whether to spray or not might not be thinking about how much water just your weeds are using.”

In this study, they are portioning evaporation and transpiration.

“This will allow us to get an idea of just how much water is going to the weeds,” Walton said.

This is the second year of the study being conducted by Walton for her thesis project.

In last year’s plots, she showed in the uncontrolled weed plots, 10 more inches per acre of water was used where there was heavy weed pressure — and her corn yield was almost 100 bushels per acre less.

Bell said one of the questions she continuously gets from producers on herbicides is about the cost – at low commodity prices, they are concerned about spending an additional $20, $30 or $40 per acre on herbicides. But when they see how much water is used as well as how much yield is lost to poor weed control, they recognize there is a return on the herbicide investment even at low commodity prices.

The study this year is concentrating on the most efficient time to apply herbicides. In her study, Walton measures leaf area and light penetration through the canopy. The data indicates the water used by weeds early in the season results in reduced leaf area and plant size.

“Plants that start behind stay behind and never catch up,” Bell said. “This is critical because in corn, early competition for resources is affecting ear development. When there is good weed control, there is canopy closure and light interception by leaves. Light is also a very valuable resource. In plots with heavy weed pressure, there is less leaf area and greater light penetration through the canopy.”

Walton’s data show the preplant application is the most critical application for herbicide. She said her leaf area measurements show how important it is early in corn development to control the small weeds and not use the resources needed by the corn.

“If there is anything a farmer can do or is going to do, they need to make that preplant application,” Bell said. “Keep the weeds down at the beginning of the season so we can put the resources toward the crop, which will choke those weeds out later.”

Herbicide treatments pre- and post-emergence show the difference in weed pressure on a treated and untreated corn plot. (Texas A&M AgriLife photo by Bronc Finch)
**October**

22-23 - Turf Producers of Texas Fishing Tournament -
22-25 - Annual Meeting ASA, CSSA, SSSA - Tampa, FL
25-27 - CAST Board Meeting - Raleigh, NC
28 - College of Agriculture and Life Sciences Tailgate, AGLS Complex

**November**

10 - Legacy and Leadership Banquet, Brazos County Expo Complex
23-24 - Thanksgiving Holiday
27-28 - Amarillo Farm and Ranch Tour
29- Dec.1 - Texas State Support Council Meeting

**December**

December 5-6 - Texas Plant Protection Conference - Bryan-College Station
December 5-7 - Texas Turfgrass Annual Conference and Show - Arlington
December 23 - Jan 2. 2018 - University closed for Holidays

**Save the Date**

January 3-6, 2018 - Beltwide Cotton Conference - San Antonio, TX
January 8 - Soil and Crop Sciences Faculty Meeting
January 24 - Small Grains Advisory Committee