January
February
March
2015

The Department of Plant and Soil Science

NEWSLETTER

this issue

New Faculty Highlight: Brendan Kelly

Brendan Kelly has been named a research assistant professor in Texas Tech's Department of Plant and Soil Science, according to officials within the College of Agricultural Sciences and Natural Resources. He officially stepped into his new research post on Jan. 1.

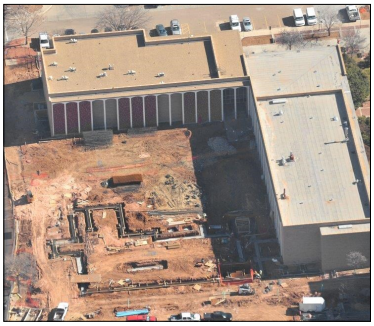
The Midland, TX native indicated that he is particularly interested in the measurement of cotton fiber properties and investigating their impact on yarn quality and processing performance. His research utilizes big data generated by modern fiber quality evaluation instruments.

One of his primary goals here at Tech is to work with the research community and industry partners to develop varieties with improved fiber quality. He is also interested in evaluating new fiber quality assessment protocols and instruments in order to meet industry needs.

Prior to joining the Tech faculty, Kelly worked as a research associate and research assistant at Tech's Fiber and Biopolymer Research Institute. He also served as a research assistant and teaching assistant in Tech's Department of Plant and Soil Science. He received his bachelor's degree in mathematics and his doctorate degree in plant and soil science from Texas Tech University.

New PSS Wing Construction Update

Construction for the New Bayer Plant Science Building is currently under way. The project has an estimated completion time of the end of August 2015. Here are some pictures from the last few months!



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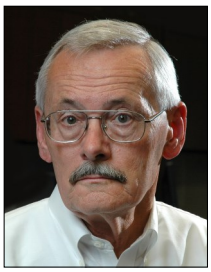
Grants & Research Update

In the last quarter, the Department of Plant and Soil Science faculty members have been awarded over $1 million in external grant funding. Here are three grant highlights from all of these awards.

Dr. Chuck West received $100,000 from the USDA (United States Department of Agriculture) Southern Sustainable Agriculture Research and Education (SARE) Large Systems Research Grant Program for a project titled "Long Term AgroEcosystems Research and Adoption in the Southern High Plains." The project supports the management and maintenance of the pasture research facility at New Deal. The research conducted at the New Deal station covers the use of grazing systems with beef cattle that, when integrated into farming systems involving annual crops, can reduce inputs of irrigation water, fertilizers, and pesticides, while building up soil organic matter and microbial diversity. The impetus for this research is the declining supply of groundwater from the Ogallala aquifer used in large scale, row-crop farming, and therefore the need for systems that use less water while building soil quality and maintaining profitability.

The proposed work will support infrastructure for conducting research on overall water use of forage systems. Results will feed directly into a current outreach program (Texas Alliance for Water Conservation, http://tawc.us) and offer answers on how to reallocate diminishing irrigation water to annual row crops and forage systems to maximize economic returns. The premise is that there are novel methods of managing forages which are as climate-resilient as native grasslands but more economically productive, and which entail user-friendly technologies for monitoring use of water and making economic decisions. Maintenance of a top quality forage research facility serves as a glue for research and education collaborators to conduct short-term and long-term studies and outreach to stakeholders.



Dr. Terry McLendon has been developing EDYS ecological models of the San Antonio River Watershed for use by The San Antonio River Authority (SARA) in their management of water resources. Dr. McLendon has been assisted in this work by his doctoral student Cindy Pappas, by PSS research scientist Dr. JD Booker, and by Dr. Cade Coldren of the US Army Corps of Engineers. SARA recently entered into a multi-year research agreement with TTU to continue the work by Dr. McLendon and this team, and a grant to conduct the first phase of this research was recently received by TTU in the amount of $167,126.

The current grant is to continue the work on the ecological model for the San Antonio Bay ecosystems. The 2015 project will concentrate on continuing the field work of measuring the productivity of marshes around the Bay, refining the Ecological Dynamics Simulation (EDYS) models of the responses of these marshes to changes in water and salinity levels, and integrating models of shrimp and clam populations with marsh and open bay dynamics. Work will also continue on collecting vegetation data in the five-county watershed through which the San Antonio River flows and modeling the impacts of climate fluctuations, brush control, shifts in cultivation practices, urban growth, and mineral development activities on the vegetation dynamics, water balance, and sediment loadings of the region.

Drs. Eric Hequet, Brendan Kelly, and Noureddine Abidi were awarded $426,658 from Cotton Inc. Cotton fiber is an industrial raw material primarily used in the production of spun yarns. Ring-spinning mills, a high-value target market for cotton producers, require bales of cotton exhibiting predictable spinning performance and consistent yarn quality. Cotton bolls are set throughout the season within the plant structure and are subjected to varying developmental conditions. These developmental differences contribute to within-plant variation in fiber quality. In addition, cotton fiber is subjected to mechanical processes such as harvesting, ginning, and cleaning. Aggressive mechanical processes degrade fiber quality by breaking fibers. Natural within plant variability and fiber breakage during processing have the potential to negatively impact processing performance and yarn quality. This collaborative research effort will investigate the impact within plant variability has on yarn quality. It will also elucidate the impact fiber maturity has on the fiber length distribution and fiber breakage during processing, and the impact of processing on fiber elongation. Improved fiber testing methods will lead to the development of germplasm exhibiting improved spinning performance, increasing demand for cotton on international spinning markets.

Faculty News

Dr. Pete Dotray was selected as one the recipients of the Texas Tech RaiderReady First-Year Advocate and Faculty Fellowship Award.

Dr. Pete Dotray is one of 11 TTU Faculty members selected as an Integrated Scholar for 2014-2015. An Integrated Scholar is a faculty member who not only demonstrates outstanding teaching, research and service, but also is able to generate synergy among the three functions.

Dr. David Weindorf traveled to Akola, India in December to sign a Letter of Intent between TTU and Dr. Panjabrao Deshmukh Krishi Vidyapeeth (PDKV) University. The agreement will facilitate greater exchange of faculty and students and help with collaborative research/ grantsmanship opportunities.

Dr. Noureddine Abidi and his lab at FBRI have been instrumental in creating a new biodegradable bandage with a cotton base. The product was recently featured in the Lubbock Avalanche-Journal: http://bit.ly/1ynZKvy

Using project funds from the 2012 South Central Sun Grant Award through the USDA, Dr. Dick Auld has been successfully investigating the use of the seeded safflower crop in sustainable biodiesel production. Dr. Auld's research has been featured on the Sun Grant's Website: http://sungrant.okstate.edu/?page_id=3642

Kirk Williams, Viticulture Certificate Instructor, made two presentations at the Texas Wine Grape Growers Association Grape Camp on November 2nd and 3rd in Fredericksburg. The presentation titles were Planting a Vineyard and Micronutrients.

Dr. Cynthia McKenney was inducted as a Fellow in the American Society for Horticultural Science. In addition, she is serving as the Vice President-elect for the Education Division for the Society.

Recent publications and presentations include:

- Sharma, A., D.C. Weindorf, D.D. Wang, and S. Chakraborty. 2014. Characterizing soils via portable x-ray fluorescence spectrometer: 4. Cation exchange capacity (CEC). Geoderma 239-240:130-134 doi: http://dx.doi.org/10.1016/j.geoderma.2014.10.001.
- Fowler, D.N., S.L. King, and D.C. Weindorf. 2014. Evaluating abiotic influences on soil salinity of inland managed wetlands and agricultural croplands in a semi-arid environment. Wetlands 34(6):1229-1239.
- Weindorf, D.C., N. Bakr, and Y. Zhu. 2014. Advances in portable x-Ray fluorescence (PXRF) for environmental, pedological, and agronomic applications. Advances in Agronomy, doi: http://dx.doi.org/10.1016/B978-0-12-802139-2.00001-9.http://dx.doi.org/10.1016/B978-0-12-802139-2.00001-9.
- Hannachi, N., S. Cocco, F. Fornasier, A. Agnelli, G. Brecciaroli, L. Massaccesi, D.C. Weindorf, and G. Corti. 2014. Effects of cultivation on chemical and biochemical properties of dryland soils from Southern Tunisia. Agriculture, Ecosystems and Environment 199:249-260. doi: http://dx.doi.org/10.1016/j.agee.2014.09.009.
- Paulette, T. Man, D.C. Weindorf, and T. Person. 2015. Rapid assessment of soil and contaminant variability via portable x-ray fluorescence spectroscopy: Copşa Mică, Romania. Geoderma 243-244:130-140. doi:10.1016/j.geoderma.2014.12.025.
- S.S. Spearman, I.V. Rivero, N. Abidi. 2014. Influence of Polycaprolactone /Polyglycolide Blended Electrospun Fibers on the Morphology and Mechanical Properties of Polycaprolactone. *J. Applied Polymer Science, 131(9) 40224*.
- A. Mittal, R. Balasubramanian, J. Cao, P. Singh, S. Subramanian, G. Hicks, E. A. Nothnagel, N. Abidi, J. Janda, D.W. Galbraith, C.D. Rock 2014. "*TOPOISOMERASE 6B* is involved in chromatin remodeling associated with hormone and environmental control of carbon partitioning, secondary metabolite and cell wall synthesis, and epidermal morphogenesis in Arabidopsis". *J. Experimental Botany*, 65(15) 4217-4239.
- S. Sanjit, N. Abidi, R. Rajbhandari, F. Mewlewaeter. 2014. Chemical cationization of cotton fabric for improved dye uptake. *Cellulose*, 21, 4693-4706.
- L. Cabrales, N. Abidi, F. Manciu. 2014. Characterization of developing cotton fibers by confocal Raman spectroscopy. *Fibers*, 2, 286-294.
- Y. Hu, J.M. Catchmark, Y. Zhu, N. Abidi, X. Zhou, J. Wang, N. Liang. 2014. Engineering of porous bacterial cellulose towards human fibroblasts in-growth of tissue engineering. *J. Materials Research*. 29(22)2682-2693.
- S. Sumedha, N. Abidi, D. Auld. Galactomanna extracted from guar seeds: Chemistry and thermal stability. Fracturing Impacts and Technologies, September 4-5, 2014, Lubbock, TX.
- Leasure, D., D.D. Magoulick and S.D. Longing. 2014. Natural flow regimes of the Ozark-Ouachita Interior Highlands region. River Research and Applications, DOI: 10.1002/rra.2838.
- Discua, S., S. Longing, and J. Cokendolpher. Adult emergence phenologies of nine endemic insects at the Monahans sandhills in western Texas. Entomological Society of America Annual Meeting, November 17th – 21st, Portland, OR.
- Discua, S. and S. Longing. Occupancy Modeling of nine endemic insects from the Monahans sandhills in western Texas. Entomological Society of America Annual Meeting, November 17th – 21st, Portland OR.
- Longing, S., S. Discua and J. Cokendolpher. First comprehensive surveys of endemic insects at the Monahans sandhills in western Texas. Entomological Society of America Annual Meeting, November 17th – 21st, Portland OR.
- Cui, S., Zilverberg, C.J., Allen, V.G., Brown, C.P., Moore-Kucera, J., Wester, D.B., Mustafa, M., Chaudhuri, S., Phillips, N., 2014. Carbon and nitrogen responses of three old world bluestems to nitrogen fertilization or inclusion of a legume. Field Crops Research, 164, 45-53. http://www.sciencedirect.com/science/article/pii/S0378429014001373
- Fultz, L.M., Moore-Kucera, J., Calderon, F., Acosta-Martinez, V., 2014. Using fourier-transform mid-infrared spectroscopy to distinguish soil organic matter composition dynamics in aggregate fractions of two agroecosystems. Soil Science Society of America Journal, 78(6), 1940-1948. https://dl.sciencesocieties.org/publications/sssaj/abstracts/78/6/1940

Important Dates

January

15: First day of Spring Classes

19: University Holiday

20: Last day to add a course

30: Last day to drop a course without penalty

March

16-20: Student Spring Break Holiday

20: University Holiday

25: Last day to drop a course with penalty

If you have questions or comments regarding any information on this newsletter, or to be removed from the PSS distribution database, please contact Christi Chadwell, Communications and Recruiting Coordinator, Christi.chadwell@ttu.edu

PSS News

A team of researchers at Texas Tech University, in collaboration with Bayer CropScience and the National Center for Genome Resources (NGCR) have developed a view into the structure of the cotton A-genome. This is a significant accomplishment in the sequencing of the cotton genome, which will fuel multi-disciplinary basic and applied research to help increase cotton productivity.

The Department of Plant & Soil Science was awarded a Borlaug fellow from Malaysia through the Norman E. Borlaug International Agricultural Science and Technology Fellowship Program. Drs. Venugopal Mendu and David Weindorf of Plant & Soil Science, are the recipients of the award. The Borlaug fellowship is a 12 week research fellowship administered by USDA's Foreign Agricultural Service. The program promotes food security and economic growth by providing training and collaborative research opportunities to fellows from developing and middle-income countries. The Borlaug fellow, Hii Mei Mei will work on identification of cell wall degrading enzymes from soil bacteria. Cell wall degrading enzymes have wide variety of applications including in biofuel industry.

The TTU Turf Science program will have a booth at the Golf Course Superintendents Association of America (GCSAA) meeting in San Antonio, February 25-26, 2015. We will have a group of undergraduate students participating in the 21st Annual Collegiate Turf Bowl Competition. We invite all of our alumni to stop by booth #26007, say hello, and learn more about what is going on with our turf program.

Dr. Scott Longing and Samuel Discua (PhD student) conducted an insect pollinator workshop on November 22nd for the Growing Results for Urban Business (GRUB) youth program (http://www.spfb.org/programs-services/grub/) at the South Plains Food Bank Farm in Lubbock.

PSS Alumni Ronnie Hopper and R.N. Hooper were selected for the 2015 Cotton Foundation Farm Press High Cotton Award for the Southwest Region.

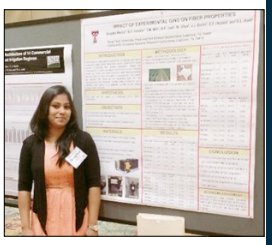
2015 is the International Year of Soils. This will bring advocacy, awareness, and education about "healthy soils for a healthy life." Various events, publications, and information is expected to be happening within the department, as well as the United Nation's General Assembly throughout the year of 2015.

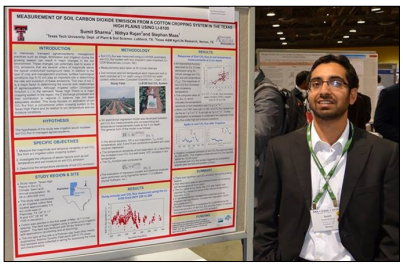
Student News

PSS undergraduate student, Jorge Penso presented a poster at the American Geophysical Union in San Francisco in December. Title was "An improved high-throughput method for p-nitrophenol based enzyme assays to aid soil ecology studies." JA Penso, J Moore-Kucera, V Acosta-Martinez.

TTU Graduate students competed in various competitions in the Beltwide Cotton Conferences in the beginning of January. Among those that presented research, the following students won awards:

- Dylan Wann placed 1st in the oral presentation with a presentation title: "Breeding Value of Host Plant Thrips Resistance for New Cultivar Development."
- Misha Manuchehri place 3rd in the oral presentation with a presentation titled : "Weed Management Considerations for Control of Southern Root-Knot Nematode in Cotton ."
- Ryan Gregory placed 1st in the poster competition with a poster titled: "Visual Field Screening Strategy for Seed Purity and Quality in Conventional Breeding Nurseries."
- Deepka Mishra placed 2nd in the poster competition with a poster titled "Impact of experimental gins on fiber quality."





Two graduate students received awards at the CSSA, ASA, and SSSA Society meetings in November:

- Alex Rocateli placed 4th in the paper competition with a paper titled: "Simulating switchgrass biomass yield and N removal using Almanac."
- Summit Sharma placed 1st in the poster competition with a poster titled "Measurement of soil carbon dioxide emission from a cotton cropping system in the Texas High Plains "