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The Department of Plant and Soil Science

NEWSLETTER



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New Faculty Hire: Dr. J.D. Booker

Dr. J.D. Booker has been named an assistant professor in urban soils in the Department of Plant and Soil Science. He officially stepped into his new post on Jan. 1.

Dr. Booker indicated that he is interested in studying the cycling and interactions among water, sediments, nutrients, and contaminants in urban, disturbed, specialty food production, horticultural, recreational, and industrial soils and their associated ecosystems. The research program will implement a combination of field research and eco-hydrological modeling, designed to evaluate these areas of interest at the system level. Data resulting from his research will provide relevant data sets, methodologies, and tools to support decisions made by urban designers, land managers, the regulatory community, urban and specialty food production organizations, and additional urban, municipal, and industrial stakeholder groups.

One of his primary goals is to integrate the urban soils program with the collaborative research, teaching, and outreach necessary to develop the department's new area of focus in local food and wine production. Understanding soil hydrology, nutrient, and potential pollutant balances in intensively managed viticulture and specialty food production will increase the environmental and economic sustainability of these unique agricultural production systems.

Participating in this new focus area will facilitate development of new curriculum and research opportunities for students interested in agriculture and environmental quality management in urban, industrial, and intensively managed settings, he said.

Prior to joining the Tech faculty, Dr. Booker worked as a research scientist and graduate research assistant/instructor in the department. He served as an environmental compliance specialist with the City of Lubbock, assistant research scientist with Texas AgriLife Research's Soil Fertility Research Group, and project scientist with the Environmental Protection Department at the Battelle Memorial Institute's Pantex plant.

Recent honors for Dr. Booker include Tech's Plant and Soil Science Outstanding Dissertation (2013); Helen De Vitt Jones Excellence in Graduate Teaching Award (2012); James A. "Buddy" Davidson Water Conservation Endowed Scholarship (2012); Noble and Kay Koepp Graduate Fellowship Scholarship (2011); and A.W. Young Graduate Student Endowed Support Scholarship (2011).

Dr. Booker received his bachelor's degree in soil science from New Mexico State University-Las Cruces, and his master's degree from Auburn University. His doctorate degree is from Texas Tech. He is a member of the Soil Science Society of America, Agronomy Society of America, Crop Science Society of America, and Soil and Water Conservation Society.

Narrative written by Norman Martin with the CASNR Dean's Office.



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Grant & Research Update

The U.S. textile industry has traditionally been focused on the production of medium and coarse rotor spun yarns. After a period of rapid expansion from 1980 to 1997, the U.S. textile industry began a phase of rapid decline. At its peak (1997), the U.S. textile manufacturing industry consumed 2,471,000 metric tons of cotton (about 10.8 million bales). At its lowest point, in 2011, the consumption of cotton in the U.S. shrunk to 718,490 metric tons (about 3.3 million bales). Since 2008, the consumption has oscillated between 3.3 and 3.8 million bales per year. This resulted in about 80% of the U.S. cotton production being exported. This shift to international markets dominated by the production of higher quality ring-spun yarns has transformed the requirements on cotton fiber properties. Textile mills interested in sourcing cotton from the global cotton marketplace emphasize fibers that are long, uniform, mature, fine, strong, and with low contamination levels. This, in turn, places increasing demand on local cotton producers. Drs. Eric Hequet, Brendan Kelly, and Noureddine Abidi of the Fiber and Biopolymer Research Institute (FBRI) were awarded by Cotton



Incorporated for a series of four grants addressing the challenges involved with producing cotton fiber competitive on international markets.

The high throughput of international spinning mills increases demands for yarns with improved tensile properties. Historically, improvements in yarn and fiber tensile properties have been achieved through improving cotton fiber strength. While this has led to large improvements in the fiber quality profile of the most commonly grown cultivars, fiber strength is not the only important fiber tensile property. The total energy required to break a cotton yarn is determined by both the fiber strength and elongation of the fibers.

A combination of factors has led to the exclusion of fiber elongation in most germplasm improvement efforts. These factors include a belief that improving fiber strength will necessarily result in a reduced fiber elongation, and the lack of elongation reference material for instrument calibration. However, research at the FBRI revealed that cotton fiber elongation and strength can be simultaneously improved. In addition, improving fiber elongation can result in drastic improvements in the total energy required to break cotton yarns. These results led to the first set of industry wide cotton fiber elongation reference bales, developed by the team at the FBRI.

Increasing industry demands on yarn tensile properties, along with the new availability of elongation standards, has increased interest in understanding the relationships between fiber elongation, other fiber qualities, and their importance in spinning performance. The FBRI research team will be investigating these physical properties and their multivariate structure through processing in their projects, "Elucidating the impact of processing on fiber elongation," and "Elucidating the impact of fiber maturity on fiber length distribution and fiber breakage."

Ring spinning markets also place demands on cotton producers in terms of fiber maturity, fineness, and length. Breeders need tools in order to develop cultivars that produce cotton fiber with a profile competitive on these international markets. The projects "Improving the utility of fiber quality parameters as a screening tool in breeding programs" and "Maturity and Standard Fineness: determination, calibration, and use" will address these issues and contribute to ensuring that High Plains cotton producers remain competitive on international spinning markets for years to come.

Important Dates

January:

20: First day of Spring classes

24: Last day to add a course

February:

3: Last day to drop a course without academic penalty

March:

13-17: Spring Break

17: University offices closed

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

Grant & Research Update Cont.

The "OAP Water Management to Sustain the Economic Activity from the Ogallala Aquifer on the Southern High Plains- TTU" grant is part of an integrated research project that combines funds from Cotton Incorporated, the United Sorghum Partners, and the Ogallala Aquifer program to conduct research on irrigation rate and timing in intercropped cotton and sorghum. Work in this project is being conducted under the direction of Drs. Glen Ritchie, Katie Lewis, and Chuck West. The project also supports two graduate students in the department, Nick Macha and Kelsey House. The purpose of the work is to determine if there are ways to plant cotton and sorghum together in a field with deficit irrigation and maximize the yield and net returns of both crops by alternating water between crops at the times of their highest demands. This, in turn, will help producers in the Texas High Plains with limited irrigation resources.



PSS Student & Staff News

The following students received diplomas at the December 2016 commencement ceremonies:

Bachelor in plant and soil science: **Andrew Tanner Cadra**, **Gregorio Elorza**, **Garrett Irwin**, **Caitlin Joyce**, **James Austin McClure**, **Aaron McCoy**, **Lindsay Northcut**, **John Jack Searway**, **Fallon Smiley**, and **Shelby Young**

Master of Science in plant and soil science: **Jennifer Chagoya** and **Jonathon Shockey**

Master of Science in Horticulture: **John Kerlin**

Ph.D. in plant and soil science: **Travis Conley** and **Deepika Mishra**

During the Annual Meeting of ASA/CSSA/SSSA in Phoenix, **Clayton White** won third place with his poster titled *Impact of Agronomic Practices on Soil Biological Properties on the Texas High Plains*.

The **Soils Judging Team** hosted the Region IV Soils Judging contest during the fall semester. Schools that participated include University of Arkansas, Oklahoma State University, Texas A&M University, Texas A&M at Kingsville, and Tarleton State University.



Christi Chadwell has been invited to serve on the Lubbock Chamber of Commerce Board of Directors to chair the Young Professionals of Lubbock organization for 2017.

Faculty News

Dr. **Peter Dotray** was invited to serve on the Agricultural Science Committee of the U.S. Environmental Protection Agency's Science Advisory Board for 2016-2018. This appointment allows Dr. Dotray to serve as a special government employee and provide independent expert advice on technical issues underlying EPA policies and decision making.

Dr. **Ashley Elle** was selected to receive the Mortar Board and Omicron Delta Kappa Faculty Recognition Award for 2017.

Dr. **Cynthia McKenney** has been awarded the 2016 Chancellor's Council Distinguished Teaching and Research Award.

Dr. **Noureddine Abidi** has been appointed as Managing Director of FBRI starting January 1, 2017. Dr. Abidi has been with Texas Tech University since 1999 and has built a strong research program.

Dr. **Abidi** has been selected as an Integrated Scholar for 2017. There are only 11 faculty university-wide selected for this honor each year.

Dr. **Peter Dotray** and his research team were awarded the Texas A&M AgriLife Extension Superior Service Award on January 10.

Texas A&M AgriLife's Vice Chancellor's Award for Excellence in Programming has been awarded to the Texas Superstar® Plant Selection Team. This team is composed of six members from Texas A&M AgriLife Research and Extension, as well as **Cynthia McKenney** and **Russ Plowman**. The Texas Superstar® plant team trials ornamental plants selections along with fruits and vegetable in four testing regions across Texas to identify cultivars that are resistant to high temperature, require minimal soil preparation and do not need pesticides. The Lubbock trials provide the most challenging location with the most drought and temperature swings. When superior plants are identified, the team selects three plant to promote during different seasons of the year. This is accomplished by partnering with the nursery industry and providing so they are able to grow these plants off for at least a year prior to the Texas AgriLife promotions. All plant write-ups are released to local newspapers as well as being promoted on radio and TV through local extension personnel. In addition, The Texas Department of Agriculture has published color brochures with all of the plant information. Over time, many nurseries have used this plant selection program to increase plant sales, especially during slow periods. It has been estimated that this partnership with the nursery industry has resulted in over \$50 million profit. For more information on this program, you may navigate to the website <http://texassuperstar.com/index.html>

Dr. **Peter Dotray** has been awarded as the holder of the Rockwell Professorship. Dr. Dotray's nationally recognized research programs, excellent teaching record, national and organizational involvement, and his service to the department have been key factors that led him to hold this professorship. His expertise is sought after in several conferences, presentations, and committee memberships.

Dr. **Noureddine Abidi** has been awarded as the holder of the Leidigh Professorship in Plant and Soil Science. Dr. Abidi's scientific intuition and creativity are significant contributors to his successful research programs. He is a leader in his field and well respected in the scientific community.

The following publications and presentation were made over the last quarter:

- Cardelli, V., **D.C. Weindorf**, S. Chakraborty, B. Li, M. DeFeudis, S. Cocco, A. Agnelli, A. Choudhury, D. Ray, and G. Corti. 2017. Non-saturated soil organic horizon characterization via advanced proximal sensors. *Geoderma* 288:130-142.
- **Pearson, D.**, S. Chakraborty, **B. Duda**, B. Li, **D.C. Weindorf**, **S. Deb**, E. Brevik, and D.P. Ray. 2017. Water analysis via portable X-ray fluorescence spectrometry. *Journal of Hydrology* 544:172-179.
- Chakraborty, S., **D.C. Weindorf**, **S. Deb**, B. Li, S. Paul, A. Choudhury, and D.P. Ray. 2017. Rapid assessment of regional soil arsenic pollution risk via diffuse reflectance spectroscopy. *Geoderma* 289:72.81.
- Mora, J.L., J. Herrero, and **D.C. Weindorf**. 2017. Multivariate analysis of soil salination-desalination in a semi-arid irrigated district of Spain. *Geoderma* 291:1-10.