TEXAS A&M PLANT BREEDING BULLETIN

April 2020

TEXAS A&M UNIVERSITY--EDUCATING AND DEVELOPING PLANT BREEDERS WORLDWIDE TO ALLEVIATE HUNGER AND POVERTY THROUGH GENETIC IMPROVEMENT OF PLANTS

Upcoming meetings that impact us as plant breeders and plant improvement scientists, entrepreneurs, seedsmen, industry representatives, etc. are stilled planned as of today.

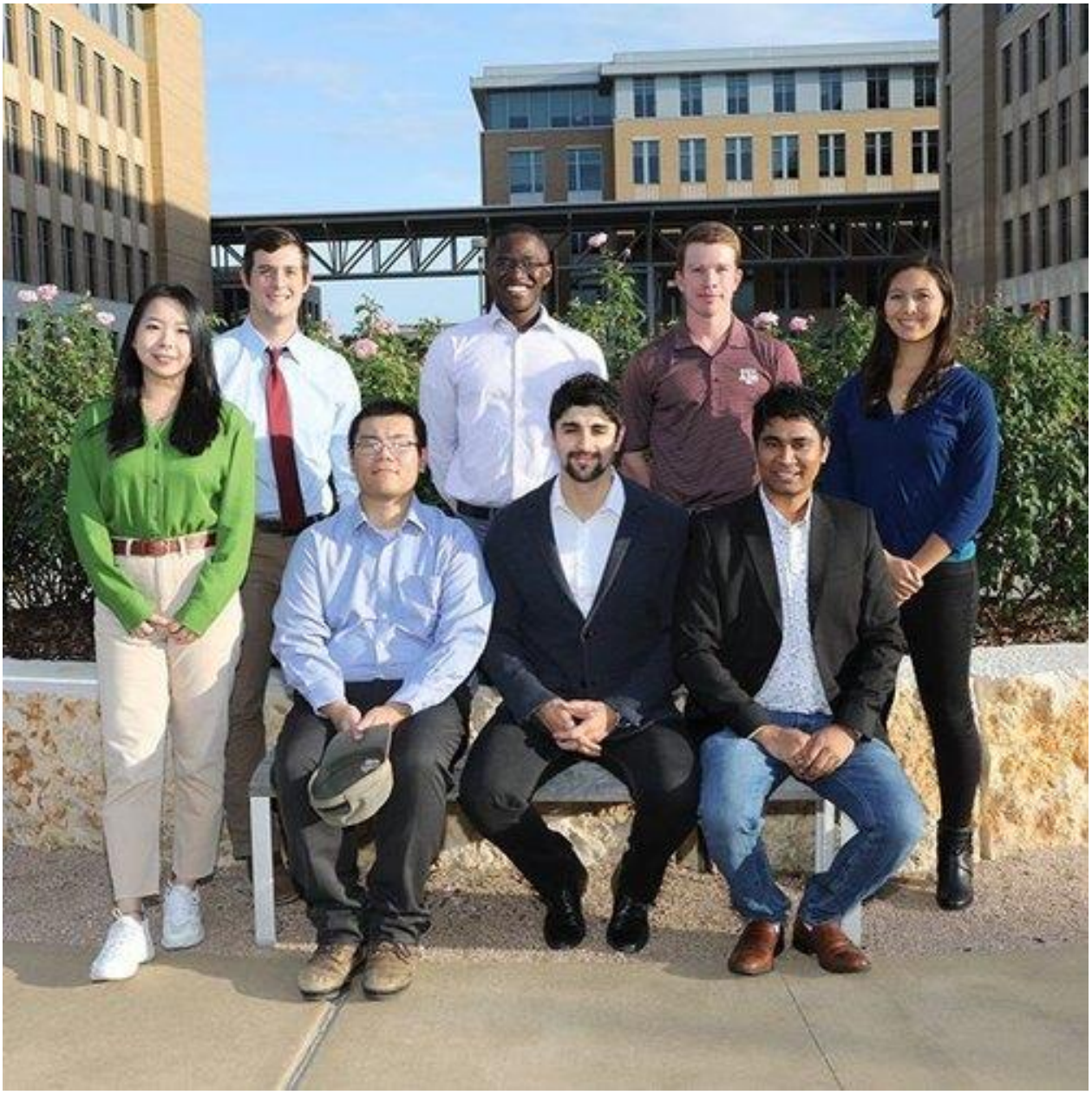
The American Society of Horticultural Science 2020 annual conference is scheduled for August 9 through 13 in Orlando, FL. Additional information at https://ashs.org/.

The National Association of Plant Breeders and the Plant Breeding Coordinating Committee will hold their meetings at the University of Nebraska in Lincoln from August 16 through August 19. More information at https://www.plantbreeding.org.

The Agronomy Society of America / Crop Science Society of America / Soil Science Society of America will hold their annual trisocieties meeting November 8 - 11 in Phoenix, AZ and information can be found at https://www.acsmeetings.org/.

The format of these meetings are under constant review given the seriousness of the coronavirus pandemic that we are experiencing.

In this season of coronavirus driven social distancing and mask wearing, I want to revisit and highlight the eight graduate students at Texas A&M University who planned and executed our 2020 Texas A&M Plant Breeding Symposium. This group of young folks are an encouragement to all of us as we contemplate near-future uncertainty but have complete confidence in our long-term future and success.



Left to right: Xiaoqing Shen, Mitchell Kent, Ze Fang, Roy Davis, Jales Fonseca, Daniel Crozier, Jeewan Pandey, and Tia Dunbar.

Daniel Crozier is a MS student in the sorghum breeding and genetics program under Dr. William Rooney. He came to Texas A&M after completing a BS in plant biology from North Carolina State University. His research focuses on analyzing sorghum grain structural characteristics and predicting heterosis using genetic similarity derived from genome wide SNP Data. After finishing his MS, he plans on continuing his education to receive a PhD and pursue a career in plant breeding.

Daniel enjoys multiple hobbies with most of them driven by his passion for the outdoors or athletics.

Roy Davis is a third-year PhD student in Plant Pathology and Microbiology with Dr. Thomas Chappell. He obtained his BS in Biology from Campbell University in North Carolina in 2015. His research focuses on examining inoculum dynamics in two pathosystems: Fusarium wilt of cotton (*Fusarium oxysporum* f. sp. *vasinfectum*) and citrus Huanglongbing (*Candidatus Liberibacter asiaticus*). Specifically, his research goals are to quantify inoculum density and empirically determine the modes of pathogen movement in order to develop models of in-field disease dynamics.

In addition to his research, Roy has served as the president of the Plant Pathology Graduate Student Club, as a senator to the Graduate Student Government, and as a co-sessions coordinator for the 2019 Texas A&M Student Research Week. Roy is a television enthusiast who, in his spare time, enjoys kickball.

Tia Dunbar is a first-year MS student studying plant breeding under Dr. Michael Thomson in the Department of Soil and Crop Sciences. Originally from California, she graduated with a BS in Biological Sciences from the University of California-Davis in 2019. Her current research involves optimization of *in planta* transformation of rice. She is also collaborating on a joint project seeking to increase rates of recombination in cotton through gene editing. She aims to pursue her interest in plant breeding and genetics with a future career in crop improvement.

Tia is an active participant in on-campus extracurricular activities. She is the Soil and Crop Sciences Departmental officer in TAMU's Women in Science and Engineering (WiSE) and a member of the Texas A&M Minorities in Agriculture-Natural Resources-and Related Sciences (MANNRS). In her spare time, Tia likes to cook and bake, especially dishes to share with lab mates.

Ze Fang is a first year PhD student in the Molecular and Environmental Plant Science (MEPS) interdisciplinary program. He graduated from Iowa State University with a BS in agronomy and MS in plant breeding under Drs. Allen Knapp and Jessica Barb, with a focus on sunflower seed and seedling root phenotyping and GWAS. He is currently in his first year rotation, working with Dr. Koiwa on characterizing LOX6 transgenic Arabidopsis plants. He will be joining Dr. Okumoto's Lab once his rotation is completed.

Ze enjoys tasting different foods and fancy philosophical discussions on random subjects.

Jales Fonseca is a third-year PhD student in plant breeding and genetics under the supervision of Dr. William Rooney in the Department of Soil and Crop Sciences. Born in Brazil, he graduated with a BS in Agronomy from Sao Paulo State University and obtained his MS in Plant Breeding and Genetics from Federal University of Lavras. His research focuses on evaluating grain sorghum hybrids developed by the United States public sorghum breeding programs. Additionally, he is assessing the power of genomic prediction in sorghum breeding programs to predict hybrid combinations based on inbred line genomic information. His project is a collaborative effort between Texas A&M and Kansas State University.

In the future, he aspires to become the CEO of a major seed company. Jales invest at least one hour a day - six days a week – to working out at the gym. When he is not in the field, lab, classes, or gym, Jales plays the acoustic guitar, watches series/movies, reads the news (especially about politics) and cooks food for the week (meal prep). He added that coffee is "absolutely his favorite drink," and believes that coffee makes life easier (many of us would agree).

Mitchell Kent is a MS student in plant breeding with the Sorghum Breeding and Genetics Lab under Dr. William Rooney. He is a native of Illinois and received a BS in Crop Sciences from the University of Illinois in 2018. He has three research projects: [1] assessment of the grain yield and functionality of sorghum hybrids with increased protein digestibility and waxy endosperm; [2] evaluation of threshing methods and harvest maturity for popping attributes in sorghum genotypes; and [3] evaluating genotype by environment interactions of sorghum silage in Texas.

Mitchell's hobbies encompass many activities that involve the outdoors, such as cycling.

Jeewan Pandey is a PhD student in the potato breeding and genetics program of Dr. Isabel Vales. He is originally from Nepal and received his BS in Agriculture Science (Plant breeding) at Tribhuvan University, Nepal. He was awarded his MS by the University of Arkansas at Pine Bluff in 2015 where he conducted research on sweet potato breeding and genetics. His PhD research project includes screening potato clones for disease resistance using molecular markers. He aspires to graduate and advance his career as a plant breeder, reducing global hunger by improving crop yield and nutrition.

Jeewan enjoys traveling, and photography. He notes that traveling allows him to adapt to new situations and use his organizational and planning skills to ensure successful travels. He combines his joy of traveling with photography dealing with landscapes, flowers, architecture, and cultures. He refers to himself as "the confused amateur photographer." He noted that he has a little understanding of how exposure works but is still learning how to "read" lights.

Xiaoqing Shen is a first year PhD student from Sichuan, China under Dr. Jamie Foster and Dr. Russell Jessup in the Department of Soil and Crop Science. Currently, Xiaoqing is focusing on collecting data and developing algorithms to identify functional plant groups or species in grasslands as well as documenting biomass accumulation utilizing UAS based remote sensors. Xiaoqing received her BS in Turfgrass Management at Michigan State University and Sichuan Agricultural University. She graduated in August 2019 with her MS in Plant

Breeding with her thesis research dealing with the quantification of biochar amended soil carbon content assessed by Ground Penetrating Radar.

The opportunity to observe and learn from our graduate students such as these always confirms my optimism for the future. I hope that this review of the 2020 TAMU Plant Breeding Symposium Leadership lightens your day and encourages each of you as well.

Stay Safe!
Wayne

Publications by Soil & Crop Sciences Plant Breeding Faculty

First Quarter, 2020

Chandra: Ambika Chandra, Anthony D. Genovesi, Meghyn Meeks, Ying Wu, Milt C. Engelke, Kevin Kenworthy, Brian Schwartz. 2020. Registration of 'DALZ 1308' zoysiagrass. *Journal of Plant Registrations* https://doi.org/10.1002/plr2.20016

da Silva: Kennedy M. Fernandes, Roberto A. Tenenbaum, Edwin B. M. Meza, João Batista L. da Silva, Diego N. Brandão. 2020. Use of the Luus-Jaakola optimization method to minimize water and energy consumption in scheduling irrigation with center pivot systems. *Irrigation Science* https://doi.org/10.1007/s00271-020-00663-6.

Dever & Smith: Linghe Zeng, Deborah L. Boykin, Jinfa Zhang, Efrem Bechere, Jane K. Dever, B. Todd Campbell, Tyson B. Raper, Calvin Meeks, Wayne Smith, Gerald O. Myers, and Fred M. Bourland. 2019. Analysis of Testing Locations in Regional High-Quality Tests for Cotton Fiber Quality Traits. *The Journal of Cotton Science* 23:284-291.

Dever: Ruvini W. Mathangaderra, Eric F. Hequet, Brendan Kelly, Jane K. Dever, Carol M. Kelly. 2020. Importance of cotton fiber elongation in fiber processing. *Industrial Crops and Products* https://doi.org/10.1016/j.indcrop.2020.112217

Dever: Jane Dever, Carol Kelly, Addissu Ayele, John Zwonitzer, Paxton Payton, Don Jones. 2020. Registration of CA 4007 cotton germplasm line for water-limited production. *Journal of Plant Registrations* https://doi.org/10.1002/plr2.20034

Dever: Abdelraheem Abdelraheem, David D. Fang, Jane Dever, Jinfa Zhang. QTL analysis of agronomic, fiber quality, and abiotic stress tolerance traits in a recombinant inbred population of pima cotton (*Gossypium barbadence* L.). *Crop Science* https://doi.org/10.1002/csc2.20153.

Ibrahim: Sat Pal Sharma, Daniel I. Leskovar, Kevin M. Crosby, A. M. H. Ibrahim. 2020 GGE Biplot Analysis of Genotype-by-environment Interactions for Melon Fruit Yield and Quality Traits. *HortScience* https://doi.org/10.21273/HORTSCI14760-19

Murray: Bridget A. McFarland, Naser AlKhalifah, Martin Bohn, Jessica Bubert, Edward S. Bucklet, Ignacio Ciampitti, Jode Edwards, David Ertl, Joseph L. Gage, Celeste M. Falcon, Sherry Flint-Garcia, Michael A. Gore, Christopher Graham, Candice N. Hirsch, James B. Holland, Elizabeth Hood, David Hooker, Diego Jarquin, Shawn M. Kaeppler, Joseph Knoll, Greg Kruger, Nick Lauter, Elizabeth C. Lee, Dayane C. Lima, Aaron Lorenz, Jonathan P. Lynch, John McKay, Nathan D. Miller, Stephen P. Moose, Seth C. Murray, Rebecca Nelson, Christina Poudyal, Torbert Rocheford, Oscar Rodriguez, Maria Cinta Romay, James C. Schnable, Patrick S. Schnable, Brian Scully, Rajandeep Sekhon, Kevin Silberstein, Maninder Singh, Margaret Smith, Edgar P. Spalding, Nathan Springer, Kurt Thelen, Peter Thomison, Mitchell Tuinstra, Jason

Wallace, Ramona Walls, David Wlls, Randall J. Wisser, Wenwei Ex, Cheng-Ting Yeh, & Natalia de Leon. 2020. Maize genomes to fields (G2F) 2014-2017 field seasons: genotype, phenotype, climatic, soil, and inbred ear image datasets. *BMC Research Notes* 13:71.

Murray: Tyler L. Foster, Heather D. Baldi, Xiaoqing Shen, Byron L. Burson, Robert R. Klein, Seth C. Murray, and Russell W. Jessup. 2020. Development of Novel Perennial *Sorghum bicolor* x *S. propinquum* Hybrids. *Crop Science* https://doi.org/10.1002/csc2.20136

Murray: Steven L. Anderson II and Seth C. Murray. 2020. R/UAStools::plotshpcreate: Create Multi-Polygon Shapefiles for Extraction of Research Plot Scale Agriculture Remote Sensing Data. *BioRxiv* https://doi.org/10.1101/2020.02.21.960203

Muray: Simone Scalabrin, Lucile Tonuitti, Gabriele Dr Gaspero, Davide Scaglione, Gabrile Magris, Michele Vidotto, Sara Pinosio, Federica Cattonaro, Federica Magni, Irena Jurman, Mario Cerutti, Furio Siggi Liverani, Luciano Navarini, Lorenzo Del Terra, Gloria Pellegrino, Manuela Rossana Ruosi, Nicola Vitulo, Giorgio Valle, Alberto Pallavicini, Giorgino Graziosi, Patricia E. Klein, Nolan Bentley, Seth Murray, William Solano, Amil Al Hakimi, Timothy Schilling, Christophe Montagnon, Michele Morgante & Benoit Bertrand. 2020. A single polyploidization event at the origin of the tetraploid genome of *Coffea arabica* is responsible for the extremely low genetic variation in wild and cultivated germplasm. *Scientific Reports* 10:4642.

Rooney: Henrique D. R. Carvalho, James L. Heilman, Kevin J. McInnes, William L. Rooney, Katie L. Lewis. 2020. Epicuticular wax and its effect on canopy temperature and water use of Sorghum. *Agricultural and Forest Meteorology* https://doi.org/10.1016/j.agrformet.2019.107893.

Rooney: Francisco E. Gomez, John E. Mullet, Anastasia H. Muliana, Karl J. Niklas, William L. Rooney. 2020. The genetic architecture of biomechanical traits in sorghum. *Crop Science* https://doi.org/10.1002/csc2.20049.

Septiningish: Satyen Mondal, M. Iqbal R. Khan, Shalabh Dixit, Pompe C. Sta. Cruz. Endang M. Septiningsih, Abdelbagi M. Ismail. 2020. Growth, productivity and grain quality of AG1 and AG2 QTLs introgression lines under flooding in direct-seeded rice system. *Field Crop Research* https://doi.org/10.1016/j.fcr.2019.107713.

Septiningish: Shamistha Ghosal, Fergie Ann Quilloy, Carlos Casal Jr., Endang M. Septiningsih, Merlyn S. Mendioro, & Shalabh Dixit. 2020. Trait-based mapping to identify the genetic factors underlying anaerobic germination of rice: Phenotyping, GXE, and QTL mapping. *BMC Genetics* 21:6.

Smith & Hague: C. Wayne Smith, Ben Beyer, E. F. Hequet, S. Hague, D. Jones. 2020. TAM BB-2139 ELSU extra long staple upland germplasm. *Journal of Plant Registrations* https://doi.org/10.1002/plr2.20024.

Smith: Efrem Bechere, Dick L. Auld, C. Wayne Smith, Roy G. Cantrell, Eric F. Hequet, Glen L. Ritchie, Irish L. B. Pabuayon, Depika Mishra, Braile R. Hendon, Nino Brown, Branden R. Kelly. Registration of six upland cotton germplasm lines with improved fiber quality through ethyl methane sulfonate treatments and selection. 2020. *Journal of Plant Registrations* https://doi.org/10.1002/plr2.20005.

Stelly: Corrinne E. Grover, Mengqiao Pan, Daojun Yuan, Mark A. Arick II, Guanjing Hu, Logan Brase, David M. Stelly, Zefu Lu, Robert J. Schmitz, Daniel G. Peterson, Joathan D. Wendel, Joshua A. Udall. 2020. The *Gossypium longicalyx* genome as a resource for cotton breeding and evolution. *BioRxiv* https://doi.org/10.1101/2020.01.08.898908.

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Please direct comments concerning this bulletin to Wayne Smith, cwsmith@tamu.edu or 979.845.3450.

Distance Plant Breeding at Texas A&M – Continuing Education

For more information visit https://scsdistance.tamu.edu/ or contact LeAnn Hague, Distance Education Coordinator in Soil and Crop Sciences at leann.hague@tamu.edu or (979) 845-6148.