



**Dale Bumpers National Rice Research Center
USDA-ARS
Stuttgart, Arkansas**



JUNE 2018

MONTHLY RESEARCH HIGHLIGHTS

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- **Technology Transfer**
 - ✓ **Interactions with the Research Community**

During June 20-26, Dr. Jinyoung Barnaby was invited to visit the Crop Breeding Research Division of the National Institute of Crop Science (NICS), the Genomics and Phenomics Divisions of the National Institute of Agricultural Science (NIAS), the Protected Horticulture Research Institute of the National Institute of Horticultural and Herbal Science (NIHHS), of the Rural Development Administration (RDA) in the Republic of Korea. The invited presentations included “Using high-throughput genotyping and phenotyping to dissect rice-soil microbiome interactions affecting greenhouse gas emissions and identify candidate genes affecting rice grain quality” and “Using high-throughput genotyping and phenotyping to identify candidate genes affecting rice grain quality”. Tours of the newly built Phenomics Facility of NIAS and Smart Farm System Facility of NIHHS were made. Discussions were conducted with the Director General of NICS and NIAS, the Research leaders of Genomics/Phenomics/Crop Breeding Research Division and senior scientists.



- ✓ **Rice Germplasm Distributed**

During June, 324 rice accessions from the Genetics Stocks *Oryza* (GSOR) collection were distributed to researchers in the United States.

- **Stakeholder Interactions**

Research conducted by scientists at DBNRRC (Shannon Pinson, Yulin Jia, and Melissa Jia) is featured on the cover of the July/August issue of Crop Science (published online June 21, 2018 at

<https://dl.sciencesocieties.org/publications/cs/tocs/58/4>). The cover caption reads: Rice kernels with internal fissures (right side of photo) are more likely to break during the milling process than intact kernels (left). Breakage of rice during milling reduces incomes of farmers, millers, processors, and international marketers. One common cause of kernel fissuring is the occurrence of rain or dew on mature rice in the field. Reabsorption of moisture into the dry, mature kernels creates internal pressures that can cause stress fissures in the rewetted kernels. Heavy dews occur daily through the rice harvest season in Arkansas, where about half the US rice is produced. Although fissure-resistant cultivars are desired, they have proven difficult to breed for. Two QTLs associated with resistance to kernel fissuring discovered in a new genetic source will help breeders develop rice cultivars that break less due to fissure resistance. Photo by Eric Grunden.



On June 21, 2018, Dr. Anna McClung, Research Geneticist, presented an overview of recent research accomplishments and future research goals of the DBNRRC at the annual meeting of the Mid-South Chapter of the American Society of Farm Managers and Rural Appraisers held in Stuttgart, AR.

- **Education and Outreach**

High school student, Ms. Emily Sookaserm, is being mentored by Drs. Ming-Hsuan Chen and Georgia Eizenga as she conducts her senior science project for the Arkansas School for Mathematics, Sciences and the Arts. Emily's research project focuses on identifying quantitative trait loci for the rice grain physical traits of length and width and chalkiness using a rice recombinant inbred line mapping population



On June 5, 2018 the DBNRRC hosted 10 local teachers from five different schools who participated in the “USDA Future Scientists Program”, a summer workshop for teachers directed by Dr. Craig Wilson, USDA-ARS Plains Area. As part of the training, each school received a digital microscope and teachers were trained on how to incorporate the digital imaging into classroom experiments. Dr. Anna McClung presented an overview of DBNRRC rice research activities; Dr. Georgia Eizenga discussed the rice germplasm collection, demonstrating trait variation in rice varieties, and suggested ways to use the information in classroom activities; Melissa Jia, Aaron Jackson, Dr. Trevis Huggins, and Brenda Lawrence gave a “hands-on” demonstration of DNA extraction and genetic analysis; and Dr. Jai Rohila made a presentation entitled “Growing Rice with Less Water”.



On June 26, 2018, Dr. Yulin Jia, Research Plant Pathologist, and Alan Sites, Biological Science Technician, demonstrated how to evaluate rice seedlings for blast disease reactions to graduate students at University of Arkansas at Pine Bluff (UAPB) (an 1890s institution). The blast fungus was grown at DBNRRC by Tracy Bianco and the rice seedlings were infected at UAPB. The objective of this study is to examine the resistance function of a major blast resistance gene and is a part of thesis research by Mr. Bed Prakash Bhatta.



On June 27, the DBNRRC in Stuttgart, AR hosted nine girls, ages 11 – 15, plus four adult educators who were participating in a program designed to encourage young girls to pursue science, technology, engineering and math (STEM) education and become the scientists, engineers and computer programmers of tomorrow. This program, designed to expose young girls to STEM career possibilities and introduce them to female STEM professionals, is sponsored by the Museum of Discovery in Little Rock, AR. At the DBNRRC, the girls extracted DNA, learned about cooked rice quality by conducting grain chemistry analysis and sensory tests, learned how to rate rice seedlings for disease resistance, performed photosynthesis measurements on drought stressed plants, and visited field plots where the effect of soil chemistry on grain nutritional value is being investigated. ARS employees who interacted directly with the visitors were Drs. Anna McClung, Ming-Hsuan Chen and Shannon Pinson, Ms. Melissa Jia, Tracy Bianco, Heather Box, Tiffany Sookaserm, Brenda Lawrence, and Mr. Aaron Jackson and Matthew Schuckmann.

