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

NOVEMBER 2023

MONTHLY RESEARCH HIGHLIGHTS

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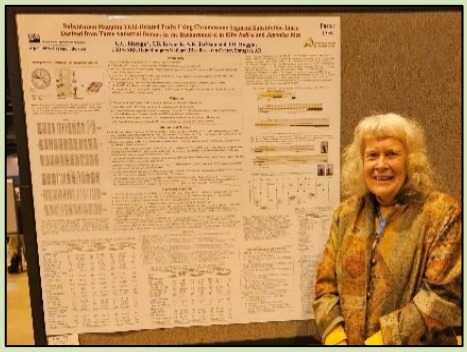
- **Technology Transfer**

  - ✓ **Interactions with the Research Community**

Drs. Georgia Eizenga, Shannon Pinson, and Anna McClung (retired) from the DBNRRC attended the annual Crop Science Society of America (CSSA) meeting held in St. Louis, MO, Oct. 29 – Nov. 1, 2023. Dr. Eizenga presented a short talk on her poster "Phenotypic Characterization of Six Wild Introgression Line Libraries in Elite *Indica* and *Japonica* Rice Backgrounds" which introduced to the research community six new rice populations useful for discovering novel genes and alleles from wild species that are not otherwise available to rice breeders. Dr. Pinson presented the talk "Genetically Enhancing Rice Resistant Starch, a Dietary Fiber, to Combat Chronic Diseases" summarizing results from collaborative research between ARS and the University of Arkansas that identified the combination of alleles at three genes affecting starch biosynthesis that breeders can use to maximize resistant starch content in milled rice grains. As the recipient of the Frank N. Meyer Medal for Plant Genetic Resources, Dr. McClung received a medal and presented the talk "Rice Genetic Resources – a World of Opportunities" summarizing the growth in and importance of germplasm in the USDA rice world collection maintained by the National Small Grains Collection in Aberdeen, ID, and in the Genetic Stocks – *Oryza* (GSOR) collection, maintained by the DBNRRC in Stuttgart, AR.



Georgia Eizenga explaining the value of six wild introgression line rice populations.

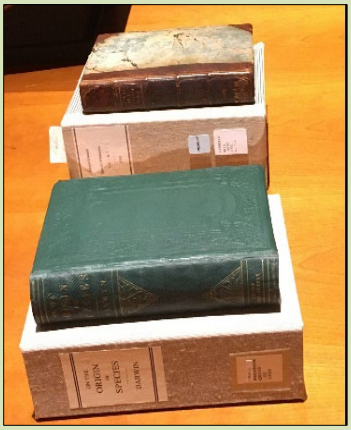
Shannon Pinson elucidating the value of rice resistant starch.

Anna McClung receiving the Frank N. Meyer Medal

As the 2023 Chair of the CSSA Plant Genetic Resources (C08) Division, Dr. Eizenga worked with moderators to organize 12 guest speakers for two scientific symposia, participated in selecting the Calvin Sperling lecturer and best C08 papers published in *Crop Science* in 2022, judged the student poster/5 min rapid oral competition, and chaired the C08 business meeting.

Georgia Eizenga receiving a certificate of appreciation for serving as 2023 C08 Chair.

Dr. Pinson organized a group tour of the Missouri Botanical Gardens in downtown St. Louis. The tour took 42 attendees "behind-the-scenes" in the herbarium where they had opportunity to see preserved collections of rare ancestral maize, teosinte, a plant specimen collected and signed by Audubon, rare books including authors Carl Linnaeus and Charles Darwin, as well as the herbarium stacks holding more than 100,000 plant specimens.



Left - Charlie Miksicek showing preserved samples of teosinte at the herbarium at the Missouri Botanical Gardens. Center –Jordan Teisher showing how their more than 100,000 preserved plant samples are stored and organized per the Linnaeus system of identifying and cataloguing plants by the Phylogenetic Tree (family, genus, species, cultivar). Right – Rare books: Charles Darwin, *Origin of the Species* (1859) and Carl Linnaeus, S*pecies Plantarum* (1753).

Two ARS Research Geneticists at the DBNRRC received awards at the annual Tri-Society meeting held in St. Louis, MO. October 29-November 2, 2023. Dr. Shannon Pinson was presented with the Crop Science Society of America Fellow award, which is the highest recognition bestowed by the Society. Members of the Society nominate worthy colleagues based on their professional achievements and meritorious service with only up to 0.3 % of the Society's active and emeritus members being elected. Dr. Anna McClung (retired) was presented with the Frank N. Meyer Medal for Plant Genetic Resources, which recognizes persons for outstanding achievements in the exploration, evaluation, maintenance, administrative support and/or research on preservation of plant genetic resources. Dr. McClung's research and administrative leadership of the Genetic Stocks-*Oryza* (GSOR) program and efforts to improve the management efficiency of the USDA Rice Germplasm Collection have significantly increased the availability and utility of rice germplasm for research and breeding purposes.

Anna McClung (left) and Shannon Pinson (right) each received awards from the Crop Science Society of America.

Through email communications on November 28 and 29, 2023, Dr. Shannon Pinson interacted with Dr. Muhammad Asyraf Md Hatta at the University Putra Malaysia and provided to him information on the chromosomal physical locations of previously published quantitative trait loci (QTLs) that confer rice plant resistance to bacterial panicle blight.

✓ **<u>Rice Germplasm Distributed</u>**

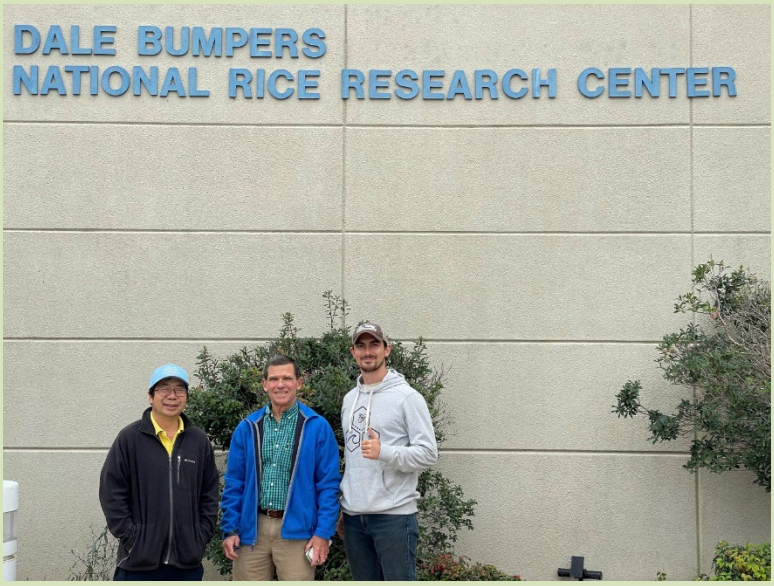
During the month of November, 398 rice genetic stocks were shipped to researchers in the United States.

- **Stakeholder Interactions**

From June to present, a rice grower expresses interest in growing perennial rice that would help rice production in sustainable agricultural system. Even since, discussions to develop a plan have been taking place among rice growers, state experimental station and ARS scientists.

On November 2, 2023, DBNRRC staff members and National Program Leader Dr. Jack Okamuro, Dr. Jai Rohila, Aaron Jackson, and Melissa Jia attended the Arkansas Rice Research & Promotion Board meeting virtually. Drs. Yulin Jia and Jeremy Edwards attended in person and presented updates of DB NRRC research activities and plans for the future at the Arkansas Department of Agriculture, the Division of Ag at the University of Arkansas, Little Rock (see more details, https://www.usarice.com/news-and-events/publications/usa-rice-daily/article/usa-rice-daily/2023/11/03/usa-rice-reports-to-arkansas-rice-research-promotion-board).

On November 14, 2023, Drs. Yulin Jia, (DB NRRC) and Bart Green (Harry K. Dupree Stuttgart National Aquaculture Research Center, SNARC) discussed the update of rice -fish production system studies with Chance Cutrano, the mayor of Fairfax, California. Chance is the Director of Programs at the forty-year-old environmental think-and-do-tank, the Resource Renewal Institute (RRI), located in Fairfax. Chance leads environmental campaigns and research projects across the United States focused on large landscape conservation and nature-based climate solutions, from the preservation of biodiversity in National Parks and wilderness areas to the restoration of wildlife habitat in agricultural ecosystems. Future collaborative studies on rice-fish with ARS (DB NRRC and SNARC) with rice farmers in Arkansas and California were discussed.



- **Education and Outreach**

On November 16, 2023, USDA-ARS ORISE Postdoctoral Research Biology Fellow Dr. Rodrigo Pedrozo joined DB NRRC. Rodrigo received his Ph.D. from Dept. of Plant Pathology, Kansas State University and did Postdoc training at Iowa State University. He will collaborate with an interdisciplinary team to help identify traits and genes that are useful for broadening genetic bases of US rice germplasm including 1) Determining location and transmission of bacterial pathogen *Pantoea ananatis* in rice seeds, sheath, leaf and panicles; 2) Identifying resistance genes to rice blast, sheath blight and bacterial blight diseases, abiotic stresses, and genes/germplasm with novel health beneficial grain traits; and 3) Identification of microbial populations impacting rice quantity and quality under different production system.

See the web version of all DBNRRC research highlights at: https://www.ars.usda.gov/southeast-area/stuttgart-ar/dale-bumpers-national-rice-research-center/docs/monthly-research-highlights/