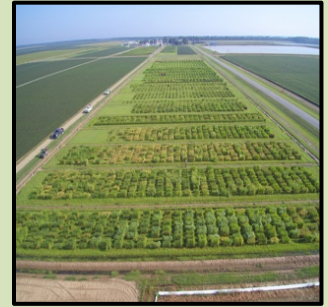**Dale Bumpers National Rice Research Center**
USDA-ARS
Stuttgart, Arkansas

FEBRUARY 2020

MONTHLY RESEARCH HIGHLIGHTS

For More Information: Dr. Anna McClung, Research Leader/Center Director
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- **Recent Scientific Publications**

  This addresses USDA-ARS Research Goal: Current crops with new traits for new uses

  John, C. Beaulieu, Shawndrika S. Reed, Javier M. Obando-Ulloa, and Anna M. McClung. 2020. Green processing protocol for germinating and wet milling brown rice for beverage formulations: Sprouting, milling and gelatinization effects. Food Science & Nutrition. DOI: 10.1002/fsn3.1534.

  Although rice is usually consumed as a milled grain, new products are being developed using rice as an ingredient. As an example, rice is used in plant-based beverages that are options for those with lactose intolerance, gluten sensitivities, and other health-related issues. With plant-based healthier nutrition in consumer's minds, dairy milk consumption is decreasing, and national and worldwide consumption of plant-based beverages has resulted in a $21 billion market. This study reports development of a safe, natural chemical process to transform brown rice into a value-added food ingredient. Brown rice was germinated under various conditions (times and temperatures) to establish a sprouting process that was then stopped before major protein, oil and carbohydrate losses occurred. In addition, the process included a novel method to soften, wet mill, sieve and gelatinize the matrix so that it could flow easily and be filtered for further processing. In addition, proteins and oils in the slurry, remained soluble which is necessary for brown rice-based beverages with enhanced nutrition.

- **Technology Transfer**

  ✓ **Interactions with the Research Community**

On Feb. 10-11 Drs. Jeremy Edwards, Trevis Huggins, and Santosh Sharma attended the Arkansas Bioinformatics Consortium (AR-BIC) annual conference in Little Rock, AR. This year's AR-BIC theme was Artificial Intelligence (AI) in Arkansas (AR). Dr.

Huggins presented a poster titled "Efficient Accession Management and Characterization of the USDA-ARS Rice Germplasm Collection through Phenotyping and Genotyping" and Dr. Sharma presented a poster titled "Genomic Prediction and Bayesian Network Analysis of Multiple Root Architecture Traits in Rice." Both posters highlighted ongoing and future applications of artificial intelligence techniques in rice research.

The 40th Rice Crop Germplasm Committee chaired by Dr. Georgia Eizenga was held on Feb. 24, with USDA-ARS committee members, Drs. Trevis Huggins, Anna McClung and Jack Okamuro, attending and Dr. Yulin Jia and Melissa Jia attending as guests. In addition to the reports by USDA/ARS and APHIS personnel, Dr. Trevis Huggins and Dr. Harold Bockelman introduced the six new trait descriptors being added for the USDA world rice collection (GRIN-Global) and discussed the addition of molecular marker descriptors for phenotypic traits.

All 10 DBNRRC scientists, two ARS post-docs and a support scientist attended the 38th Rice Technical Working Group (RTWG) Meeting that was held in Orange Beach, AL, Feb. 24-27. Together they made 14 oral presentations and four poster presentations. The meeting was attended by nearly 300 US and international rice researchers.

The "Distinguished Rice Research Team Award" at the 38th RTWG meeting was presented to Anna McClung, Melissa Jia, Yulin Jia, Bob Fjellstrom (posthumous), Jeremy Edwards, Ming-Hsuan Chen, Christine Bergman (former ARS employee) and Bill Park (Texas A&M), for "Genomic Tools for the Development and Deployment of Improved Varieties for the US Rice

Industry" developing and implementing molecular markers to validate phenotypic data for fragrance, pericarp color, blast disease resistance, leaf and hull pubescence, apparent amylose content, starch pasting properties, gelatinization temperature, and plant height. These markers are widely used by the U.S. rice breeding community and for characterizing rice accessions in the USDA-ARS National Small Grains Collection.

✓ **Rice Germplasm Distributed**

During the month of February, 454 rice accessions from the Genetics Stocks *Oryza* (GSOR) collection were distributed to researchers in the United States and India.

● **Education and Outreach**

On Feb. 11 - 13, Dr. Yulin Jia was invited to give a seminar titled "Understanding and Utilization of Plant Innate Immunity for Crop Protection" at Department of Plant Pathology & Crop Physiology, Louisiana State University (Baton Rouge), LA. During the visit Dr. Jia shared recent accomplishments with 10 faculty members and 12 graduate students in the College of Agriculture and presented a few ideas for future collaborations on rice disease research and guiding graduate students in conjunction with scientists at LSU Ag-center in Crowley, LA. Subsequently, Dr. Jia was accepted as an adjunct faculty member of LSU on February 28.

On February 21, 2020, Dale Bumpers National Rice Research Center technicians Tiffany Sookaserm, Luis Coral and Eric Grunden presented a display entitled "Genetic Discoveries in the USDA Collection of World Rice Varieties" and answered questions at the UAPB 64th Annual Rural Life Conference in Pine Bluff, AR.