February
Highlights from the Dale Bumpers National Rice Research Center
Stuttgart, AR

For more Information Contact: Dr. Anna McClung, Research Leader
anna.mcclung@ars.usda.gov

1. Recently Accepted Publications

ARS Anticipated Product: Improved efficiency in rice variety development due to identification of genes controlling economically important traits

S.R. McCouch, M.H. Wright, C.W. Tung, L.G. Maron, K.L. McNally, M. Fitzgerald, N. Singh, G. DeClerck, F. Agosto-Perez, P. Korniliev, A.J. Greenberg, M.E.B. Naredo, S.M.Q. Mercado, S.E. Harrington, Y. Shi, D.A. Branchini, P.R. Kuser-Falcao, H. Leung, K. Ebana, M. Yano, G. Eizenga, A. McClung and J. Mezey. 2016. Open access resources for genome-wide association mapping in rice. Nature Communications 7:10532 (http://DOI: 10.1038/ncomms10532)

Increasing food production is essential to meet the demands of a growing human population, with its rising income levels and nutritional expectations. Development of new crop varieties that can be grown under sustainable production systems and which are resilient to climate change will be necessary to meet this increased demand. A large collection of 1,568 rice cultivars from around the world was assembled and a set of 700,000 DNA markers, called single nucleotide polymorphisms (SNPs), was used to characterize the collection at a genetic level. This information provides a new way of evaluating genetic variability among diverse rice cultivars that will help researchers to develop better utilization strategies for breeding new cultivars. In addition, these SNP markers will help to identify genes that control of economically important traits that can be efficiently combined in new breeding lines. The power of this methodology was demonstrated using grain length which is a major factor in determining market classes for rice. In addition, other studies are underway to investigate rice blast disease, tolerance to cool temperatures at the seedling stage, mineral element concentrations, root development, and a host of other traits of agronomic importance. With a better understanding of these agronomically important traits, it should be possible to identify new genetic variation to deal with the challenges of increasing production especially on marginal land, adapting to extremes in climate, and developing more sustainable agricultural systems.

2. New Significant Research Collaborations

International

USA

3. New Awarded Grants

4. Technology Transfer

a. Formal Events:

To Non-research stakeholders

To Research Community

February 7-13, 2016. Drs. David Gealy and Dong-Hong Wu, scientists at DBNRRC and Taiwan Agricultural Research Institute, respectively, participated in the annual Weed Science Society of America/Southern Weed Science Society meeting in San Juan, Puerto Rico. Gealy presented research results on effects of intermittent irrigation on gene flow between herbicide-resistant rice and weedy red rice. Both scientists subsequently observed winter research plots at the University of Puerto Rico rice experiment station near Lajas.

b. Informal Contacts:

On 2/15/2016 Dr. Anna McClung provided information on laboratory milling equipment to a rice breeding program in Ghana.

On 2/24/2016, Dr. Shannon Pinson advised a private rice breeder through email communication on how to use marker data to identify germplasm useful for introducing blast resistance genes into his breeding populations.

During 2/24-26, 2016, Dr. Anna McClung provided information on seed supplies and agronomic characteristics of several specialty rice varieties to growers in SC, TX, CA, AR, and MS.

c. New MTAs

d. Germplasm Exchanged:

During February, 1709 rice accessions from the Genetics Stocks *Oryza* (GSOR) collection were distributed to researchers in the US, Canada and China.

5. Educational Outreach

Aaron Jackson, Geneticist, participated in the "Real Men Read" program at the Park Avenue Elementary school in Stuttgart, Arkansas on February 3, 2016. He spoke to a kindergarten class about the USDA's role in agriculture and getting rice from the field to the table. This was followed by reading a children's book to the group. He gave out USDA coloring pages and "grow your own rice" seed packets/handouts to

the class. Dr. David Gealy. Research Weed Physiologist, also participated in the program on February 23, 2016. He held a question-and-answer session with the students about science, rice and its production, and agricultural research, with 20-25 second-grade students and then read aloud three short books on adventure and black history.

Melissa Jia, Geneticist, and Jonathan Moser, Biological Science Technician, participated as judges in the Junior Academy of Sciences competition at Arkansas School for Mathematics, Sciences, and the Arts (ASMSA) in Hot Springs, Arkansas on February 25, 2016. Students presented 10-15 minute PowerPoint presentations on research experiments they conducted. Melissa was part of a three judge panel for Medicine & Health, Microbiology, and Cellular & Molecular categories, and Jonathan was part of a two judge panel for Animal Science and Plant Science categories. Many of the presentations and research projects were very impressive for high school level students, and this event was a great opportunity to provide them external feedback concerning their research and presentation.

Community Outreach:

During the annual Holiday Food Drive, DBNRRC employees collected and delivered 138 pounds of food, including 99 one-pound bags of long grain rice, to the Inter-Church Community Ministry (ICCM) Foodbank for Arkansas County, Stuttgart.

6. Awards/Honors