



March 2015
Highlights from the Dale Bumpers National Rice Research Center
Stuttgart, AR

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1. Recently Accepted Publications

ARS Anticipated Product: Genomic-assisted breeding approaches for identifying and introgressing exotic alleles into adapted backgrounds.

Wang, J., Correll, J.C., and Jia, Y. 2015. Characterization of rice blast resistance genes in rice germplasm with monogenic lines and pathogenicity assays. *Crop Protection* 72: 132-138.

Resistance (R) genes have been effectively deployed in preventing rice crop losses due to rice blast disease caused by the fungus *Magnaporthe oryzae*. In the present study, we studied the interaction between 24 monogenic lines carrying at least one major R gene with 14 common races of *M. oryzae* found in the USA. Genetic diversity of all 14 races was verified by using genomic analysis. Ten out of the 14 blast races caused disease on some of the monogenic lines, and more than 50% of the races caused disease across all monogenic lines. We found that the monogenic lines carrying Pi9 and Pita2 R genes provided broad spectrum resistance to many races of the blast pathogen. Based on these findings, a useful strategy of pyramiding blast R genes in new cultivars was proposed. Eight rice cultivars were identified that carry more than two blast R genes and can serve as useful breeding resources to improve blast resistance in the US and worldwide

2. New Significant Research Collaborations

International


USA

Dr. Anna McClung is a Co-PI with Drs. Bihu Huang and Sixte Ntamatunigro, University of Arkansas, Pine Bluff (1890s Institution) on a Capacity Building grant proposal submitted to USDA NIFA regarding “Evaluation and Development of Resistant Rice Germplasm Using Native Soils Which Induce Straighthead, A Physiological Disorder that Reduces Yield”.

Dr. Shannon Pinson has initiated a research collaboration with Dr. Aaron Smith, Louisiana State University, on genetic control of grain arsenic accumulation in rice.

3. New Awarded Grants

Dr. Yulin Jia is a collaborator with Dr. Yeshe Wamishe of University of Arkansas on a one year grant that has been funded by the Arkansas Rice Research and Promotion Board for \$62,000 titled “Development of Practical Diagnostic Methods for Monitoring Rice Bacterial Panicle Blight Disease and Evaluation of Rice Germplasm for Resistance”.





4. Technology Transfer

a. Formal Events:

To Non-research stakeholder

David Gealy, Angela Baldo, Howard Black, and Bill Luebke participated in the Roy J. Smith Barnyardgrass Workshop (named for former USDA ARS Weed Scientist) at Stuttgart, AR, March 9th.

Howard Black participated in a Cover Crop Workshop at Stuttgart, AR March 12th hosted by SARE, NRCS, and University of Arkansas Extension.

To Research Community

Dr. Anna McClung presented an invited talk at the R.F. Baker Plant Breeding Symposium at Iowa State University on March 5, 2015 hosted by DuPont/Pioneer. The title of her talk was “Exploring rice germplasm for utilization in the Southern USA”.

b. Informal Contacts:

Dr. Shannon Pinson provided information to researchers at University of Illinois about germplasm for studying cold tolerance in rice.

Dr. Anna McClung met with University of Arkansas Extension and Stephen Hilsdon of Specialty Rice, Inc., Brinkley, AR on March 13th to discuss hosting a workshop on organic rice for Arkansas farmers.

A discussion with local stakeholders was held at DBNRRC on March 26th with Drs. Anna McClung and Angela Baldo regarding potential for the carbon exchange market in rice production.

Dr. Anna McClung provided information to Minnesota State Senator David Senjem on March 27th regarding wild rice production issues.


Dr. Ming-Hsuan Chen corresponded with Priscila Bassinello, EMBRAPA, Brazil, regarding genetic markers for rice cooking quality and their association with cooked rice texture.

c. New MTAs

d. Germplasm Exchanged:

369 GSOR accessions were sent to researchers in the U.S., Belgium, Italy, Pakistan, and the United Kingdom.





Rice germplasm developed by ARS was provided to researchers in Florida and California, and to private companies in South Carolina and Arkansas.

5. Educational Outreach

On March 9, Dr. Anna McClung, serving as a graduate student committee member, participated in the MS thesis proposal defense for a student at Arkansas State University, Jonesboro, AR.

Dr. Angela Baldo began discussions with Deborah King, Vice Chancellor for Instruction at Phillips Community College, University of Arkansas about designing a bioinformatics internship program at DBNRRC.

On March 16, Dr. Yulin Jia worked with two graduate students of University of Arkansas-Pine Bluff, a 1890s Institution, to demonstrate the use of DBNRRC instrumentation for molecular genetics research.

On March 18, Dr. Jia presented an overview of ARS rice research to 8 graduate students in plant breeding from University of Arkansas and from University of Tennessee. Drs. Jia and Edwards responded to questions on genomics tools for breeding and disease resistance evaluation during a group discussion.

On March 24, 2015, Shannon Pinson spoke at the Lion's Club in De Witt, AR about the importance agricultural research to the local community and helping to sustain world food supply.

6. Awards/Honors

On March 14, Dr. Yulin Jia was recognized at the Stuttgart, Arkansas Future Farmers of America awards banquet for supervising two senior high school students in the apprenticeship program.

