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

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1. Recently accepted Publications

ARS Anticipated Product: Plants with Superior Product Quality

Bryant, R.J., Yeater, K., and McClung, A.M. 2015. Effect of Nitrogen Rate and the Environment on Physicochemical Properties of Selected High Amylose Rice Cultivars. Cereal Chemistry (accepted).

Genetic markers for the *Waxy* and *alk* genes which control amylose content and gelatinization temperature have been used by breeders to develop rice cultivars that have cooking properties desired by the parboiling and canning industries. It is important to have cultivars that provide consistent processing quality across diverse production environments. This study evaluated nine rice cultivars that have high amylose content, but different markers for *Waxy* and *alk* genes, across different fertility treatments and production environments. The results of this study demonstrated that although these high amylose cultivars had consistent ranking across environments and nitrogen fertility regimes, there were differences in rice processing quality traits that are not apparent from their genetic marker fingerprints for *Waxy* and *alk* genes.

ARS Anticipated Product: Plants with resistance or tolerance to diseases

Xing, J., Jia, M.H., Correll, J., Yuan, L.-P., Deng, H. and Jia, Y. 2015.Confirming and Identifying New Loci for Resistance to Rice Blast Disease using Field Isolates of *Magnaporthe oryzae* in the US. (doi: 10.2135/cropsci2015.02.0077; Posted 23 June 2015)

Quantitative trait loci (QTLs) in rice play important roles in controlling rice blast disease. Blast resistance QTLs are commonly identified using phenotypic data from replicated field plot experiments. However, identified resistance QTLs often are not reliable due to errors contributed by uncontrolled field environments. In the present study using a controlled greenhouse evaluation method, six resistance QTLs contributing 5.37% to 39.18% of phenotypic variation were identified with a mapping population derived from a cross of two U.S. adapted rice varieties, Lemont and Jasmine 85. Among them, three resistance QTLs had been previously reported while the remaining three were not previously reported. This study demonstrated that resistance QTLs identified under a controlled environment are reliable, and DNA markers closely linked to the resistance QTLs are useful for breeding for improved blast resistance with marker assisted selection.

2. New Significant research collaborations

International

USA

3. **New awarded grants**

4. **Technology Transfer**

   a. **Formal Events:**

      To Non-research stakeholders

      To Research Community

      On Monday, June 1, 2015 Drs. Eizenga and Gealy co-hosted visitors from the Cuu Long Rice Research Institute in the Mekong Delta of Vietnam. The group included Prof. Bui Chi Buu, senior scientist, Vietnam Academy of Agricultural Sciences (former director of Cuu Long Institute), Prof. Nguyen Thi Lang, senior scientist, Cuu Long Delta Rice Research Institute, Mr. Cuong Nguyen and Mr. Duong Dao, University of Missouri students. The event included a presentation on "Rice Research & Production in Vietnam" by Dr. Bui Chi Buu, a tour and round table discussion with the research staff.

      On June 10, 2015 the Dale Bumpers National Rice Research Center hosted Dr. Hannes Dempewolf of the Global Crop Diversity Trust, Bonn, Germany. The visit included a tour of the facility along with discussion regarding curation of the GSOR and GRIN rice collections.

      On June 24, 2015 Ms. Jessica Kivett, who recently was hired by the University of Arkansas as the Harry R. Rosen Alternative Pest Control Center Facility Manager, Fayetteville, AR visited the Dale Bumpers National Rice Research Center to gain a better understanding of the research programs and role of the UAR quarantine facilities for supporting ARS rice research. Ms. Kivett also met with Dr. Yulin Jia to review quarantine procedures for rice grown in the greenhouse.

      On Monday, June 29th, 2015 plant molecular geneticist Dr. Jeremy Edwards will present a talk at the P3 annual research symposium in Fayetteville, AR on the topic of combining and visualizing multiple large data sources to facilitate genetic discovery in diverse germplasm. This is a symposium sponsored by the P3 (Plant Powered Production) consortium to promote cross-disciplinary research into the biology underlying plant-based bioproduction.

   b. **Informal Contacts:**
      On June 22 2015, a delegation of 6 Philippine trade representatives for rice along with Mr. Edilberto Deluna, Assistant Secretary of Department of Agriculture of the

Philippines, accompanied by Chuck Wilson of the USA Rice Federation toured the Dale Bumpers National Rice Research Center. Drs. David Gealy and Yulin Jia led the tour to the labs and greenhouses and answered visitor's questions about rice research and production.
http://www.stuttgartdailyleader.com/article/20150623/NEWS/150629926

c. New MTAs

d. Germplasm Exchanged:

650 rice accessions from the Genetics Stocks *Oryza* (GSOR) collection were distributed to researchers in the US, China, India and the Netherlands.

5. Educational Outreach

On June 30, 2015, Dr. Anna McClung of the Dale Bumpers National Rice Research Center, hosted a group of high school students that are participating in a summer program conducted by University of Arkansas, Pine Bluff (1890's university). The visit included a tour of the facilities and hands-on demonstrations regarding DNA extraction, wet chemistry amylose content determination, and cooked rice sensory properties.

6. Awards/Honors

After 19 years of service with USDA-ARS, Dr. Rolfe Bryant, Research Chemist, retired from the Dale Bumpers National Rice Research Center in Stuttgart, AR on June 30, 2015. Dr. Bryant has published 40 peer-reviewed journal articles and participated in the release of 35 rice cultivars and germplasm lines. He has conducted extensive research on rice functionality in response to cultural and environmental factors as well as studies on rice genetic diversity for grain cooking and processing quality, grain chalk, protein content, volatile compounds, and hull silica content. He has been an active participant in the Louis Stokes Alliance for Minority Participation (LSAMP) program and a mentor to primary school teachers and students through the Arkansas STRIVE (Science Teachers Research Involvement for Vital Education) program and the University of Arkansas at Pine Bluff NSF-Stem Scholars Academy.