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7. Title

Development of Rice Germplasm Using Molecular and Conventional Genetic Approaches

12. Investigator Name(s) (Last Name and Initials)

Oard, J. H.; Sha, X.; Groth, D.; Linscombe, S.; Wang, J.

20. Termination Date 09/30/2013	40. Period Covered (mo/da/year): 01/01/2011 TO 12/31/2011

Outputs:

Information generated by this project was disseminated in 2011 via a total of six refereed publications, four presentations at national, regional, commodity board, and ACE meetings. Specific outputs included: Release of a new aromatic Louisiana rice variety "Jazzman" assisted by DNA marker technology; development and registration of four genetic rice lines resistant to disease in cooperation with USDA-ARS, Stuttgart, AR; identification of genes and genetic loci for resistance to rice sheath blight disease; and development and genetic characterization of a mapping population for rice grain quality. The significance of the results was discussed with regional, national, and international rice researchers, and members of the rice industry.

Outcomes/Impacts:

The new Jazzman rice variety, developed by the LSU Agcenter Rice Research Station, is an adapted aromatic, long-grain rice with high yield, good milling and grain quality characteristics. Jazzman was the first Louisiana commercial variety to be developed in part through the assistance of DNA-marker technology. Development of four germplasm lines provided critical new genetic stocks that will lead to creation of new elite varieties resistant to sheath blight and blast fungal diseases. The USDA-funded RiceCAP project generated whole genome sequences for 13 lines currently used to develop new elite U.S. varieties. Analysis and filtering of genomic sequences resulted in identification of candidate disease resistance genes that were validated in different breeding stocks and in one mapping population. Researchers from five states contributed to the RiceCAP project that resulted in development of a mapping population for studies of rice grain quality. Genetic loci and chromosomal regions were identified and associated with high grain quality in Louisiana and Arkansas derived cultivars. The mapping population will be extremely valuable to identify and map additional genetic and environmental factors that contribute to improvement in grain quality of U.S. rice.

Publications:

Sha, X.Y., S. D. Linscombe, F. Jodari, Q. R. Chu, D. E. Groth, S. B. Blanche, D. L. Harrell, L. M. White, J. H. Oard, M. H. Chen, S. J. Theunissen and B. J. Henry. 2011. Registration of Jazzman rice. J. of Plant Registrations 5(3): 304-308.

Silva, J., Groth, D.E., Moldenhauer, K.A., Oard, J.H. 2011. GGE biplot exploration of resistance to sheath blight disease in doubled-haploid lines of rice. Crop Science. 51:1028-1035.

Nelson JC, McClung AM, Fjellstrom RG, Moldenhauer KA, Boza E, Jodari F, Oard JH, Linscombe S, Scheffler BE, Yeater KM. 2011. Mapping QTL main and interaction influences on milling quality in elite US rice germplasm. Theor Appl Genet 122: 291-309.

Jia, Y., G. Liu, F. J. Correa-Victoria, A. M. McClung, J. H. Oard, R. J. Bryant, M.H. Jia, J. C. Correll. 2011. Registration of four rice germplasm lines with improved resistance to sheath blight and blast diseases. J. of Plant Registrations. 6:95-100.

Participants:

In addition to co-PIs Oard, Sha, Groth, Linscombe, and Wang, the following individuals were involved in the project: Dr. Nelson, (Kansas State University); Drs. McClung (USDA-Stuttgart), Fjellstrom (USDA-Stuttgart), Moldenhauer (Univ. AR,),Boza (Univ. AR,), Jodari (Univ. CA-Davis), Scheffler and Yeater (USDA); Drs. Jia (USDA-Stuttgart), Liu (USDA-Stuttgart), Correa-Victoria (RiceTec), Bryant (USDA-Stuttgart), and Correll (Univ. AR) Drs. Scheffler (USDA) Farmer (NCGR) Woodward (NCGR), May (NCGR); LSU PhD students Silva, Sanabria, DeGuzman, and Galam.

Target Audiences:

Target audiences for the results of this project include U.S. and international rice breeders, geneticists, and pathologists, rice commodity federations, groups, and research boards, individual U.S. rice producers, county agents, and consultants.

Project Modifications:

Nothing significant to report during this reporting period.

Approved (Signature)	Title	Date