



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



NOVEMBER 2020

MONTHLY RESEARCH HIGHLIGHTS

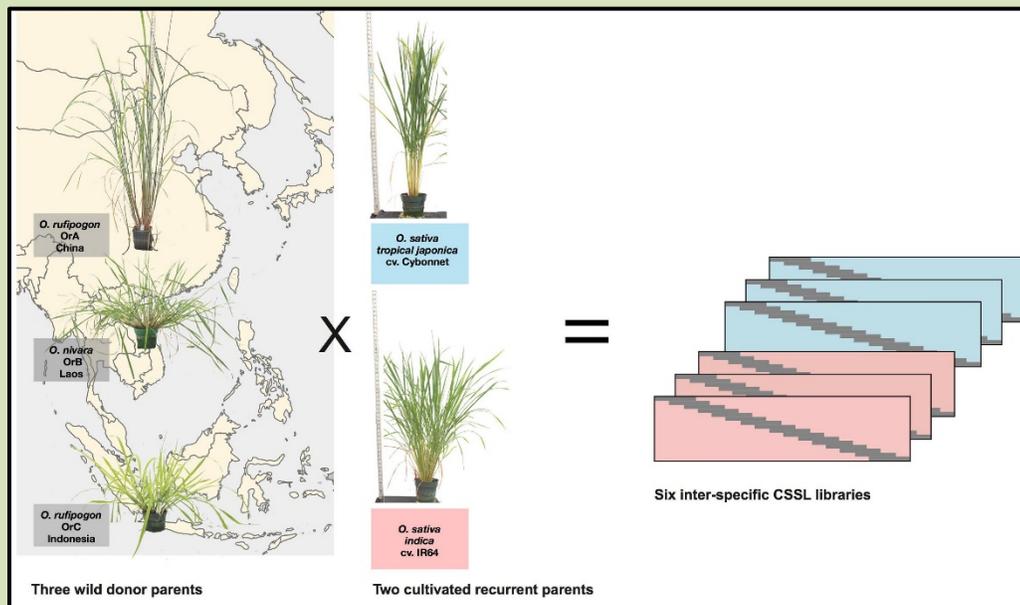
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- Recent Scientific Publications

This addresses USDA-ARS Research Goal: Well characterized genetic mapping populations designed for trait discovery, analysis, and increasing genetic diversity in crop plants

Singh, N., D.R. Wang, M.L. Ali, H.J. Kim, K.M. Akther, S.E. Harrington, J.W. Kang, E. Shakiba, Y. Shi, G. DeClerck, B. Meadows, V. Govindaraj, S.N. Ahn, **G.C. Eizenga** and S.R. McCouch (2020) A Coordinated Suite of Wild Introgression Lines in *Indica* and *Japonica* Elite Backgrounds. *Frontiers in Plant Science* 11:564824.
<https://doi.org/10.3389/fpls.2020.564824>

More than half of the world's population depends on rice for more than 20% of their daily calories, thus it is critical that we expand the diversity in the rice gene pool to develop varieties that are adapted to extreme variations in climate including heat, cold, and drought, as well as, disease and insect pressure. Rice was domesticated from the wild ancestral species, *O. rufipogon*, which harbors a wealth of genes that were lost during the domestication process. Incorporating these "lost genes" back into cultivated rice may offer new opportunities for developing new varieties that are tolerant to biotic and abiotic stresses. Cultivated rice, *O. sativa*, has diverged into the two varietal groups, *Indica* and *Japonica*. Six different populations were developed by crossing three diverse *O. rufipogon* accessions



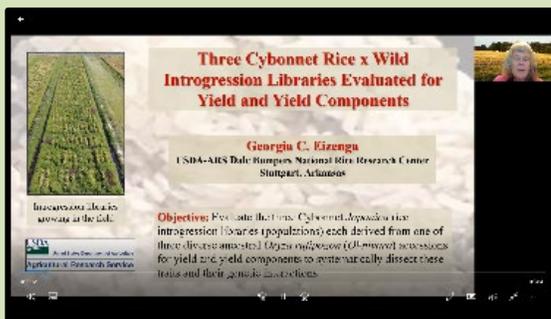
originating from China, Laos and Indonesia, with the *Japonica* variety, Cybonnet, developed in the USA and the *Indica* variety, IR64, developed in the Philippines. Each population consists of progeny that possess small chromosome segments from the *O. rufipogon* donor parents in the background of the either Cybonnet or IR64, both of which are well adapted for production in the USA. These rice lines can be used by rice breeders to identify novel genetic variation from the wild ancestral species, *O. rufipogon*, and easily incorporate the desired gene(s) or trait(s) into locally adapted, elite germplasm for the development of new high yield, resilient rice varieties.

- **Technology Transfer**

- ✓ **Interactions with the Research Community**

On November 5th, Dr. Anna McClung provided seed of several rice varieties for evaluation for salinity tolerance to researchers at Clemson University.

Drs. Shannon Pinson and Georgia Eizenga attended the virtual Crop Science Society of America meeting held November 9 to 13. Dr. Pinson presented a poster entitled “Increasing Resistant Starch in Rice through Genetics and Breeding” which was co-authored with Dr. Ming-Hsuan Chen. Dr. Georgia Eizenga presented a poster with an oral introduction entitled “Three Cybonnet Rice x Wild Introgression Libraries Evaluated for Yield and Yield Components”. The theme of the meeting was “Translating Visionary Science to Practice” and it was jointly supported by the American Society of Agronomy and the Soil Science Society of America with over 3,000 scientists, professionals, educators, and students participating.



November 20th, Dr. Yulin Jia presented a strategy to validate the effect of major rice blast resistance genes to two US rice breeders and one university professor in the USA through a virtual meeting.

- ✓ **Rice Germplasm Distributed**

During the month of November, 21 rice genetic stocks were shipped to researchers in the United States and the United Kingdom.

- **Stakeholder Interactions**

On November 20th, Dr. Anna McClung provided rice growing information and seed of four cultivars to a small farmer for potential production in NY state.

On November 30th, Dr. Anna McClung sent samples of a basmati like variety to a businessman in Texas and samples of a new pending ARS rice variety release to a miller in South Carolina for culinary acceptability tests.

- **Education and Outreach**

The Museum of Discovery, located in Little Rock, presented Dr. Anna McClung, with a Spark Star 2020 award on November 2nd. Following a keynote address from Arkansas Governor Asa Hutchinson, the award was presented to eight individuals that have demonstrated innovation in developing outreach events to encourage young students in the areas of science, technology, engineering, and math (STEM) in Arkansas.



On November 6th, Dr. Anna McClung was interviewed for a podcast by “Meat and Three” Heritage Radio Network on research related to abiotic stress tolerance in *Oryza glaberrima*.

Dr. Georgia Eizenga, Research Geneticist, became a Fellow with Crop Science Society of America at the November 9-13, 2020 virtual meeting. This is the highest recognition bestowed by the CSSA. Dr. Eizenga acknowledges the research contributions of the DBNRRC technical staff, especially Mrs. Quynh Grunden, that made this award possible. Dr. Eizenga has been with USDA-ARS since 1981 conducting genetic research on wheat wild species, tall fescue, forage grasses, and rice. She is nationally and internationally recognized for exploring wild species and unadapted, diverse cultivars for crop improvement and developing novel genetic resources for understanding



the structure of the rice genome. She has authored 54 journal articles, served in leadership positions in the Crop Science Society of America and American Society of Agronomy and as an associate editor for Crop Science, Agricultural and Environmental Letters and Rice.

On November 13th, Dr. Yulin Jia attended 2020 Virtual Graduation Ceremony of Career Development Program of Federal Asian Pacific American Council (FAPAC). A total of 14 mentees received the graduation certificates from FAPAC. Dr. Jia was selected to be the winner of Mentor of Year at the virtual graduation ceremony. This award was given to Dr. Jia who inspired a positive mentoring experience for two mentees and helped their personal, professional and career development goals. One of his mentees was recognized as the Mentee of Year.



See the web version of all DBNRRC research highlights at:

<https://www.ars.usda.gov/southeast-area/stuttgart-ar/dale-bumpers-national-rice-research-center/docs/monthly-research-highlights/>