

[P4] Crop Genetics and Physiology

Thu. Sep 9, 2021 12:15 PM - 2:00 PM Room 4 (Poster) (Crop Genetics and Physiology)

1:15 PM - 2:00 PM

[P4-18] Global Analysis of a Rice Panel to Identify QTLs and Genotypes Useful for Rice Breeding

*Nominated for Presentation Awards

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Rice as a major staple plays an important role in global food and nutritional security. Hence, its sustainable production is essential to meet the food and nutritional demands of rapidly increasing human population. But climate change induced risks pose a major challenge to food production; so there is an urgent need to provide solutions that can improve the resilience of rice food systems. The Global Rice Array Project helps to address climate change through characterization of diverse germplasm, identification of donor lines, genetic dissection of major traits and by better understanding of genotype, environment and crop management interactions. We successfully evaluated a subset of MAGIC *indica* population at 12 locations across Asia, Africa and Latin America during 2018 to 2020. MAGIC *indica* population was created using 8 Founders with desirable traits for biotic and abiotic stress tolerance, yield, and grain quality. A total of 21 data sets have been generated on yield and yield related traits. The population has been genotyped by sequencing. Preliminary analysis showed that IR13V902, IR13V924, IR13V1268 and IR13V1357 genotypes are stable and high yielding. Moreover, GGE Biplots showed that Uruguay is an environment good for selecting specifically adapted genotypes. Genome wide association study using 27041 markers showed consistent marker-trait association for flowering and plant height on chromosomes 6 and 1 respectively. Further analysis using weather, soil and crop management parameters is in progress. The results will help in understanding the complexity of interactions between genotype, environment and crop management and will lead to identification of traits, QTLs/genes and genotypes useful for breeding climate resilient rice varieties.