Characterization of the Uniform Regional Rice Nursery (URRN) for blast and quality using molecular markers for US Rice breeding Programs

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Rice blast disease is one of the most lethal diseases of rice globally. Quality traits determine cooking quality and harvestability. Breeding for rice blast resistance and improved quality are the two major breeding objectives of the US rice breeding programs. Major blast resistance (*R*) genes are effective to prevent infections by the fungus *Magnaporthe* oryzae that contains the corresponding avirulence genes. A major blast resistance gene marker *Pi-ta* is effective to prevent the two predominant races IB49 and IC17 both of which contain *AVR-Pita*. The gene specific marker for *Pi-ta* was developed from portions of the gene can be used for marker assisted breeding. Markers for quality were developed similarly for marker assisted breeding. The Uniform Regional Rice Nursery (URRN) prior to 2022 consisted of 200-250 elite lines in the southern US rice breeding programs that are in the final stages of selection prior to potential registration and release as new varieties. Starting in 1982 the URRN was first screened for phenotypic traits related to yield, quality and disease resistance and in later years molecular markers for rice blast disease resistance and quality traits were added. Here we present data on the prevalence of blast genes and types of quality genes in the URRN between 2009-2023 to determine what genes are most utilized in southern US breeding programs and whether there have been potential shifts in the prevalence of blast resistance or quality genes being incorporated in varieties.