

## **Performance of Doubled Haploid Elite Rice (*Oryza sativa* L.) Germplasm for Grain Yield and Associated Traits in Harare, Zimbabwe**

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### **Abstract**

A field experiment was conducted in 2018/2019 growing season at the Scientific Industrial Research and Development Center under irrigated conditions using the simple alpha lattice ( $7 \times 7$ ) design, with three replications. The objective of the study was to determine the performance of 44 elite rice lines that were selected and shared from elite doubled haploid germplasm and five cultivars were used as checks. All evaluated genotypes exhibited significant variation in the traits measured except for number of grains/panicle, total tillers/plant, and effective tillers/plant. Elite line 70462 was found to be the highest yielding, with yield advantage of 66% over the high yielding local check (NERICA 7). High values for broad sense heritability were recorded for days to 50% heading, panicle length, culm length, number of filled grains/panicle, 1000-grain weight, grain length, grain shape, and grain yield and indicated lesser influence of environment in expression of these traits, hence amenable to simple selection. Correlation analysis revealed that grain yield manifested significantly positive correlation with filled grains/panicle contributing the highest correlation ( $r = 0.784$ ), followed by culm length ( $r = 0.605$ ), spikelet fertility/panicle ( $r = 0.677$ ), grain length ( $r = 0.551$ ), 1000-grain weight ( $r = 0.518$ ), panicle length ( $r = 0.449$ ), and number of grains/panicle ( $r = 0.328$ ). Based on grain yield, number of filled grains/panicle and spikelet fertility/panicle, panicle length, and earliness, lines 70462, 60143, 70383, Arica 3, Sahel 177, 6040, 70537, 60409, and 70476 had the best performance. Selection of these traits would be more effective for yield improvement in rice and these promising lines could be used in the varietal development and can be tested in multilocational trials and on-farm trials in Zimbabwe with the possibility of release and commercialization