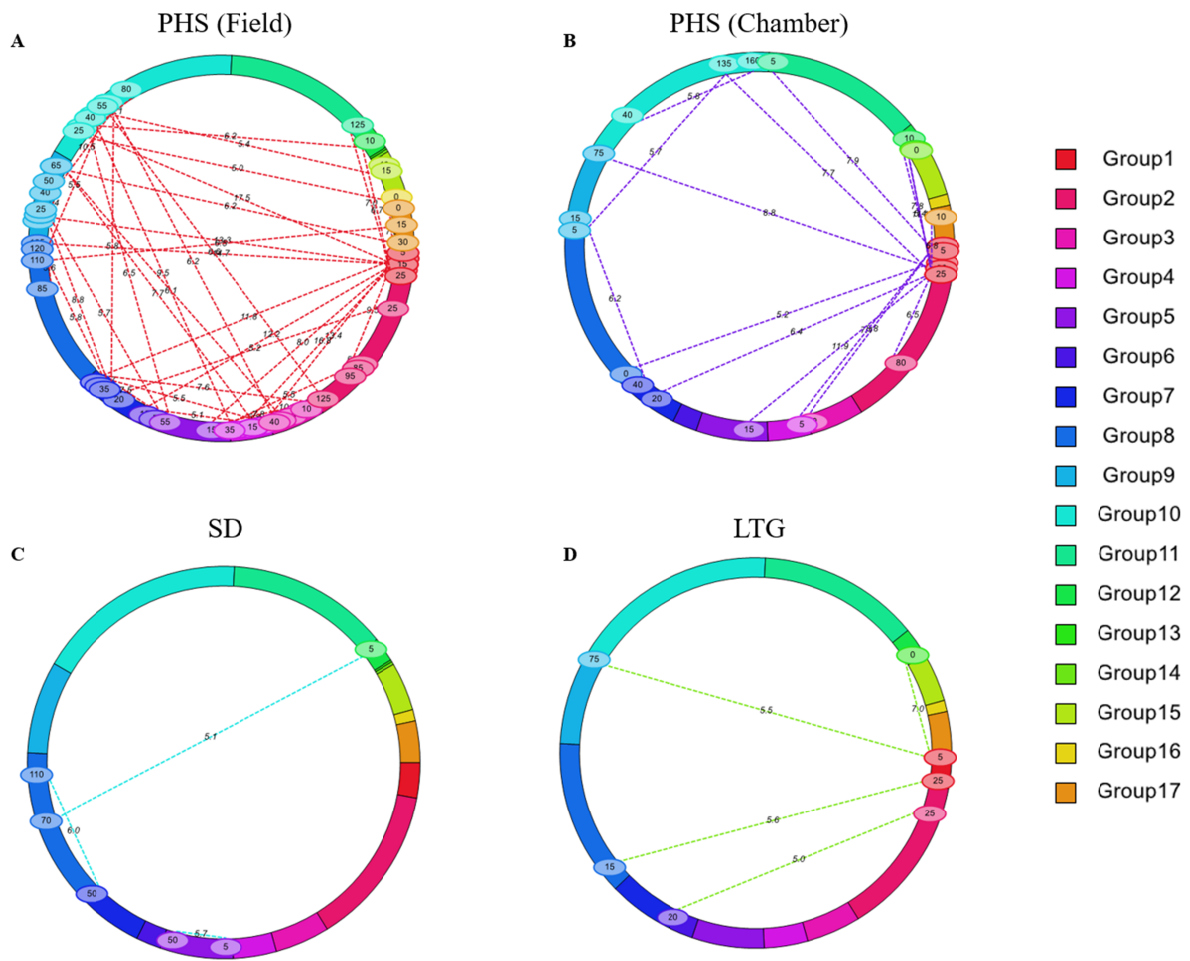


Supplementary Fig. S1. Polymorphic 20,568 SNPs distribution with PHS-T, PHS-S and 88 F<sub>2</sub> from GBS portal. Blue and red colors show each PHS-T and PHS-S's SNPs. Horizontal line represent each chromosome's SNP positions and vertical line represent count of diverse genotype in the F<sub>3</sub> population.



Supplementary Fig. S2. Cyclic illustrations of epistatic QTLs of 88 F<sub>2</sub> population for grain yield under various levels of drought stress. The dotted lines indicate marker pairs interacting significantly on same or different linkage group with their corresponding LOD value due to epistatic effect. A. Pre-harvest sprouting in the field condition; B. Pre-harvest sprouting in the chamber condition; C. Seed dormancy; D. Low temperature germination.