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Screening and Selection of some Bread Wheat (*Triticum aestivum* L.) Genotypes Adapted to High-temperature Areas of Sudan

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Abstract

Expanding wheat production into the warmer areas of Sudan becomes one of the major urgent strategic agricultural national policies. This goal, however, necessitates development of early maturing and heat tolerant cultivars. To meet this objective, twelve different selected bread wheat genotypes were field tested for performance under terminal heat stress. The genotypes were grown at two sowing dates, optimum (normal) and late (terminal heat stress) during winter season of 2008–09, at Shambat (Khartoum, Sudan). The experimental design used was split plot design with three replications. Different agronomical characters were measured and used for evaluation. These included grain yield/area, grain yield/plant, 100-grains weight, number of spikes/plant, number of grains/spike, days to booting, days to anthesis and days to maturity. The results revealed that the adverse effect of terminal heat (late sowing) was more significant and pronounced on yield and yield components. Significant effect due to the interaction between the sowing dates and genotypes was observed for grain yield/area, grain yield/plant, 100-grain weight, days to booting, days to anthesis and days to maturity. The screened genotypes exhibited differential response to the different environments, sowing dates (normal and terminal heat stress) for yield traits. Under optimum sowing date, the genotypes Teve and Hudiba2 gave the highest yield, followed by Henne, Hudiba1, and Kauz, respectively. While the genotype Samr-Pastor gave the highest yield under late sowing date (terminal heat stress) and therefore out-yielded all other genotypes including the check variety Imam. However, this genotype (Samr-Pastor) showed the similar yield performance across both sowing dates. Other genotypes that exhibited tolerance to terminal heat stress were Henne, Hudiba1 and kar, respectively. Therefore, among the twelve screened genotypes, the genotype Samr-Pastor could be selected as the most potential high yielding, heat-tolerant and stable one, which could be adapted to the non-traditional warmer areas of wheat production in Sudan.

Keywords: Bread wheat, cultivars, high temperature, screening, selection, Sudan