EFFECT OF DROUGHT STRESS ON GROWTH, YIELD AND YIELD COMPONENTS OF WHEAT GENOTYPES

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Extended Summary

The experiment was conducted in earthen pots under venyl house at the research field of Sher-e-Bangla Agricultural University campus during rabi season of 2013-2014. Fifteen (15) genotypes of wheat (collected from Wheat Research Center, BARI) were evaluated under well irrigated (control) and drought conditions. Fifteen (15) wheat genotypes were evaluated under drought (stress was imposed by withdrawing irrigation after emergence) and well irrigated (control) condition. Drought treatment (which was started after emergence up to maturity) was imposed by restricting irrigation, and plants were re-irrigated only when plant showed signs of wilting or leaf rolling. Control pots were irrigated as frequently as required to maintain adequate soil moisture. No rainfall occurred during experimental periods. The experiment was done in Completely Randomized Design (CRD) with five replications. Earthen pot (20 cm top dia., 15 cm bottom dia. and 35 cm in height) were used in this study. Pots were filled with soil and cowdung in 4:1 volume ratio and final weight of pot was 14 kg. Fertilizers @ 2.3-1-1-0.5 g/pot NPKS in the form of urea, triple super phosphate (TSP), muriate of potash (MoP) and gypsum were applied in the soil of each pot and incorporated properly. At sowing, 2/3 of urea and all other fertilizers were applied as basal. Remaining urea was top-dressed at 20 days after sowing. Seeds were sown in soil on 23rd November, 2013. Ten seeds were sown in each pot. One week after emergence, seedlings were thinned to three per pot. Five pots were employed per treatment for each genotype. Intercultural operations were done as and when required. At harvest, yield and yield contributing characters were recorded from 3 pots from each genotype. Data were analyzed statistically and mean separation was done by LSD test.

Exposure of plants to drought led to remarkable reduction in yield contributing characters which ultimate caused in reduced yield in all the genotypes. However, genotypes showed remarkable variability in yield reduction due to drought. The highest relative yield was observed in G14 followed by G13, G8 and G10. However, yield reduction was less in G14 (about 20%) followed by G8 (21%) and G13 (25%). Besides yield performance of the genotypes, some drought tolerance indices like Geometric Mean Productivity (GMP), Stress Tolerance Index (STI),

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Yield Stability Index (YSI) and Stress Susceptible Index (SSI) were used to select the desirable genotypes in the present study. Among the genotypes, G8, G10 and G14 gave better yield with higher STI, GMP and YSI with lower SSI indicating that these genotypes would be suitable for growing under drought prone areas.