GGE Biplot analysis of genotype × environment interaction in chickpea genotypes

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ABSTRACT

The objective of this study was to explore the effect of genotype (G) and genotype × environment interaction (GEI) on grain yield of 20 chickpea genotypes under two different rainfed and irrigated environments for 4 consecutive growing seasons (2008-2011). Yield data were analyzed using the GGE biplot method. According to the results of combined analysis of variance, genotype × environment interaction was highly significant at 1% probability level, where G and GEI captured 68% of total variability. The first two principal components (PC1 and PC2) explained 68% of the total GGE variation, with PC1 and PC2 explaining 40.5 and 27.5 respectively. The first mega-environment contains environments E1, E3, E4 and E6, with genotype G17 (X96TH41K4) being the winner; the second mega-environment contains environments E5, E7 and E8, with genotype G12 (X96TH46) being the winner. The environment of E2 makes up another mega-environment, with G19 (FLIP-82-115) the winner. Mean performance and stability of genotypes indicated that genotypes G4, G16 and G20 were highly stable with high grain yield.