Evaluation of adaptability in bread wheat genotypes under dryland conditions in tropical and subtropical locations

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ABSTRACT:
Comparing stability efficiency and range of conformity is becoming significant in bread wheat (*Triticum aestivum* L.). Variable environmental conditions cause to creation of great genotype by environment (G×E) interaction. The yield stability of 18 bread wheat lines and genotypes was surveyed through genotype and genotype × environment interaction using the GGE biplot method. Field experiments were accomplished in 14 rainfed environments in Iran to specify G-×-E interactions for grain yield of wheat genotypes. The trials were executed as a randomized complete block design with four replications in three years. A combined analysis of variance across environments represented that main and interaction effects (G, E and GE, respectively) were highly significant. Principal component analysis was carry out and PC_1 and PC_2 displayed 31.69% and 26.77% of the total sum of squares, respectively. Therefore, these PCes were used to develop GGE biplot diagrams. Polygon diagram of the biplot displayed two environments, (1)-Gachsaran and Moghan and (2)- Ilam and Khoramabad, for cultivation of wheat in rainfed regions of Iran. The means and stability parameters of the genotypes in the biplot indicated that genotypes G_2, G_9 and G_8 were advisable for Ilam and Khoramabad, Also, G_{14} and G_{17} were suitable for Ghachsaran, so these genotypes are adapted to warm rainfed areas of Iran and concluded for release in these locations. The biplot displayed that Khoramabad and Ilam were associated, but had no correlation with Moghan. Furthermore, Ghachsaran and Gonbad were correlated too, but had no association with other locations.

Keywords:
AMMI analysis, Rainfed condition, Stability.