Seed yield stability and analysis of genotype x environment interaction of sesame genotypes in central south of Niger

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1   ABSTRACT

The experiment was conducted in the central south of Niger in 2015 and 2016 under rainfed conditions across ten environments. The objective of the study was to evaluate the adaptability and stability of ten sesame genotypes across locations and years. The experimental design was a completely randomized block design with 5 replicates in each environment. Genotypes grain yields (averaged across environments) ranged from 722 kg ha^{-1} for 38-1-7 to 1095 kg ha^{-1} for SN403 and Environment grain yields (averaged across genotypes) ranged from 473 kg ha^{-1} at Bandé 2016 (Ban16) to 1414 kg ha^{-1} at Gounaka 2015 (Gou15). The combined ANOVA for grain yield showed significant effects of the genotypes, environments and genotype x environment interaction. According to the Genotype x Environment interaction biplot (GGE bi-plot), genotypes 10 (SN403), 6 (SN-01-06) and 1 (38-1-7) were highly stable while the unstable genotype was 4 (HB168). Furthermore, the Genotype main effects and GGE bi-plot showed Gou16 as the most discriminating and representative environment. Three different mega-environments (ME) were identified, the first ME containing Gou15, Haw15, Maï15and Dad15 with DS01 as wining genotype; the second ME concern Maï16, Band16, Haw16, Band15 and Gou16 with GK01 as the best genotype and the third ME encompassing Dad16 with HB168 as wining genotype.