

Stability Analysis of Seed Germination and Field Emergence Performance of Tropical Rain-fed Sesame Genotypes

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Abstract :

Abstract: The work was carried out to determine the stability of two seed quality traits (seed germination and field emergence) in 14 sesame genotypes that were grown in three plant population environments in Abeokuta, southwest Nigeria in each of two seasons. Seeds harvested from each environment were tested for these quality traits. Data obtained were subjected to analysis of variance of Finlay-Wilkinson regressions and stability analysis. Each genotype was defined by three stability parameters: (1) mean seed germination and field emergence over all environments, (2) the linear regression (b values) of genotype mean seed germination and field emergence in each environment, (3) the mean square deviation from the regression for each genotype (S²d value). The genotypes varied considerably in the two seed quality traits and genotype x environment (GxE) interactions were significant. Regression coefficients ranged from 0.19 to 1.70 for seed germination and 0.14 to 3.01 for field emergence. Genotype 530-6-1 with a regression coefficient close to unit (b=1.03), smaller S²d value and a relatively high seed germination of 79% had general adaptability and somehow averagely stable. The highest field emerging genotypes proved less stable and selection solely for high emergence could result in discarding many genotypes that were relatively better adapted to environmental changes. Genotypes 530-6-1, 73A-11 and C-K-2 were identified as desirable for seed production in all the three plant population environments. Genotypes 69B-88Z, Domu and 73A-97 were identified as desirable genotypes for cultivation in 133,333 plants ha⁻¹ environment, C-K-2 in 166,667 plants ha⁻¹ environment and 93A-97, 73A-11, 69B-88Z and C-K-2 in 266,667 plants ha⁻¹ environment to obtain seed of high and stable germination and emergence. These genotypes were superior in seed quality and therefore deserve a place in commercial seed production and future seed improvement strategies. [Nature and Science 2010;8(2):7-14]. (ISSN: 1545-0740).

Key Word :

environment, interaction, plant population, seed quality

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