AS> Vol.3 No.1, January 2012

OPEN ACCESS

Multienvironmental evaluation of wheat landraces by GGE Biplot Analysis for organic breeding

PDF (Size:409KB) PP. 66-74 DOI: 10.4236/as.2012.31009

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ABSTRACT

This study was conducted to determine the performance of wheat landraces cultivated under organic conditions and to analyze their stability across diverse environments. Six wheat landraces with specific characteristics (high protein content, drought tolerance, stay green) were tested under organic growing environment. The experiments were applied in three locations (Larisa (LAR), Thessaloniki (THES), Kilkis (KIL)) for three growing seasons. The role of specific agronomic traits (stay green, lodging) and their correlation with yield components were analyzed. Stability and genotypic superiority for grain yield were determined using ANOVA and genotype × environment (GGE) biplot analysis. Furthermore, the interrelationships among wheat traits and genotype-by-trait using regression analysis, coefficient of variation and (GT)-biplot technique were studied. Significant differences were found in yield among wheat landraces tested, and also in yield components, as related to specific traits expressed into organic environment. Best varieties in terms of yield were the medium statured landraces Skliropetra and M. Argolidas, characterized by lowest weight of 1000 grains, large number of spikes per m^2 meter and the highest number of grains per spike as compared to the other landraces. The statistical model GGE biplot provides useful information for experimentation of wheat landraces when grown under organic environment. It identifies clearly the ideal and representative environment for experimentation and underlines the effect of specific traits for each wheat cultivar on yield performance and stability across environments.

KEYWORDS

Wheat; Landraces; Stay Green; Lodging; GGE Biplot Analysis

Cite this paper

Koutis, K. , G. Mavromatis, A. , Baxevanos, D. and Koutsika-Sotiriou, M. (2012) Multienvironmental evaluation of wheat landraces by GGE Biplot Analysis for organic breeding. *Agricultural Sciences*, 3, 66-74. doi: 10.4236/as.2012.31009.

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