

Genotypes x environments interaction in cowpea by mixed models

Interação genótipos x ambientes em feijão-caupi via modelos mistos

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Several methods have been proposed to measure Genotypes x Environments (GxE) interaction influence on various traits of interest. Among these, mixed models approaches using REML/BLUP and random genotypes effects have been mentioned as advantageous, considering that allows obtaining the actual genotypes values of cultivation and use. However, in cowpea, methods based on the multiplicative model and the linear regression are still the most widely used for evaluating the stability and adaptability. The aim of this study was to evaluate the response of grain yield in cowpea to local and year variations, and the GxE interaction influence in genotypes e performance by mixed models. Twenty genotypes were evaluated at 47 locations between the years 2010 to 2012 under randomized complete blocB design. After joint analysis, genotypes adaptability patterns inside and outside years were tested by HMRPGV (Harmonic Mean Relative Performance of Genetic Values method. For inside year analysis, Genotype x Local interaction effects were highly significant for all the years considered. In general analysis, Genotype effects and triple interaction (GxLxY) were highly significant ($p \leq 0.01$ and $p \leq 0.001$, respectively) indicating strong GxE influence on genotypes performance. MHPRVG analysis was adequate to identify superior genotypes, and highlighted MNC02-676F-3, MNC03-737F-5-1, MNC03-737F-5-9, BRS Tumucumaque, and BRS Guariba as genotypes with best stability and hight performance for grain yield. The selection of the genotypes mentioned results in a new mean of 1402 kg ha^{-1} , which is higher than the average obtained by selection based in the phenotypic mean only (1230 kg ha^{-1}).

Keywords: *Vigna unguiculata*, GxE interaction, mixed models.

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