

Spatial and temporal yield adaptabilities of cowpea elite lines

Adaptabilidade produtiva de linhagens-elite de feijão-caupi sob variações espaciais e temporais

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The assessment of the resilience capacity and adaptability of cultivated species is crucial for both general and specific local recommendation. Crops that are better adapted to new climatic conditions take crucial role in agriculture. In this context, Cowpea is considered a strategic crop for breeding and an important protein source for poorest people. The aim of this study was to evaluate cowpea elite genotypes, for grain yield, at a wide range of latitudinal and temporal variation. Were evaluated 20 genotypes, under randomized complete block design, in 82 local x year combinations (within a local range of 25° and 26° of latitude and longitude, respectively, between 2010 to 2012 years), through GGE Biplot methodology. The joint analysis of variance showed highly significant effects ($p \leq 0.001$) of genotypes (G), environments (E), and GxE interaction, showing a strong influence of interaction effects in genotypes behavior. The decomposition of the G and GxE interaction effects showed low efficiency with two first components explaining only 38% of the total variation. According to the GGE Biplot models the 82 environments were grouped in 7 different mega-environments, and MNC03-737F-5-1, MNC03-737F-5-4, MNC03-737F-5-9, BRS Tumucumaque, BRS Cauamé, and BRS Guariba genotypes showed the most stable behavior. MNC03-737F-5-9 and BRS Tumucumaque genotypes were considered widely adapted, and BRS Tumucumaque was highlighted with the closest performance which would be a hypothetical ideal genotype. Additional studies involving other methodologies are needed for a more accurate assessment of the yield space and time variation in cowpea.

Keywords: *Vigna unguiculata*, genotype by environment interaction, climate change.

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