

Stability of total carotenoid concentration and fresh yield of selected yellow-fleshed cassava (*Manihot esculenta* Crantz)

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Abstract

The effects of genotype (G), environment (E), and G x E interaction on carotenoid concentration and yield of 25 yellow-fleshed (YF) and three white-fleshed (WF) cassava genotypes were investigated at five locations in Nigeria for two consecutive cropping seasons. The locations represented the major cassava growing agroecologies in the country and the objective was to identify stable cassava clones for yield and carotenoid levels. Location (L) and G main effects, and year (Y) x L and G x L interactions were significant ($p > 0.001$) for fresh yield and total carotenoid concentrations; G x L was the largest component of G x E. AMMI analysis revealed that carotenoid concentration is a stable trait, while yield is relatively unstable. The most stable genotypes for total carotenoid concentration with levels above the overall mean were 01/1277, 01/1235, 01/1371, 01/1413, and 01/1442. Likewise, the most stable clones for yield with above average performance were 01/1235, 94/0006, and 01/1206. The high G and low E effects, and the relatively low GEI on total carotenoid concentration imply that evaluation and selection can be effectively done in fewer environments to distinguish clones with high and stable performance while yield requires early testing in diverse and multiple environments to identify genotypes with broad and specific adaptations. Our results suggest that it is possible to breed cassava with high and stable performance for both yield and carotenoid contents.

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