Abstract

Vitamin A deficiency is rampant in Africa. High provitamin A maize (*Zea mays* L.) inbreds have been developed by the International Maize and Wheat Improvement Center (CIMMYT) in Mexico, but the inbred lines do not have the abiotic stress tolerance levels needed for production in sub-Saharan Africa. In this study, 30 hybrids obtained from crosses of 22 provitamin A and five yellow elite inbred lines from the Drought Tolerant Maize for Africa (DTMA) project were evaluated with four local check hybrids (two white and two yellow) and a Zambian orange hybrid. Evaluation was done under drought, a combination of drought and heat, low N, low P, random drought stress, and optimum conditions for two seasons. Yield was reduced by 43.27, 79.55, 68.42, and 44.27% under random drought stress, managed drought stress, a combination of drought and heat stress, and low N stress, respectively. Sixteen hybrids performed better than four checks under managed drought stress. One hybrid ranked in the top 10 hybrids in all the test environments. The β-carotene concentration of hybrids was in the expected range (4.29–12.55 μg g^{-1}) for the first-generation medium to high provitamin A maize genotypes, but on average, drought and low N stress reduced β-carotene by >60%. However, some hybrids retained a high percentage of β-carotene under stress conditions. Sufficient variability for yield and β-carotene content was demonstrated in the hybrids to allow for effective selection.