

Article title	Nitrogen Uptake and Utilization in Contrasting Nitrogen Efficient Tropical Maize Hybrids
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Abstract	Maize cultivars with improved grain yields under nitrogen (N) stress are desirable for sub-Saharan African maize growing environments. This study assesses N uptake, N utilization, and the genotype \times environment (G \times E) interaction of 16 tropical maize (<i>Zea mays</i> L.) hybrids differing in grain yield under low-N conditions. Hybrids were evaluated under low-N, medium-N, and high-N at Harare, Zimbabwe, in 2003 and 2004 and at Kiboko, Kenya, in 2003. At maturity, N accumulation in the aboveground biomass ranged from 47 to 278 kg N ha ⁻¹ in various experiments. Grain yields ranged from 1.5 to 4.3 Mg ha ⁻¹ and 10.6 to 14.9 Mg ha ⁻¹ for the same experiments, respectively. Significant G \times E interactions were observed which became more pronounced as the difference in N stress intensity between two environments increased. High grain yield under low-N was consistently associated with higher postanthesis N uptake, increased grain production per unit N accumulated, and an improved N harvest index. Additive main effect and multiplicative interaction analysis identified hybrids with specific adaptation to either low-N or high-N environments. Several hybrids produced high yields under both low-N and high-N conditions. More detailed studies with these hybrids are required to examine the underlying physiological mechanisms contributing to the N-use efficiency.
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