

# First Season Maize Performance in a Long-Term Farming Systems Comparison Trial at KARI-Thika, Kenya

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## Abstract

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Kenya's smallholder farmers contribute 65% to total agricultural output in a predominantly mixed farming system where application of inorganic fertilizers and pesticides is minimal. By contrast, agriculture in developed temperate countries is dominated by large-scale farming and heavy reliance on fertilizers and pesticides to sustain high yields. Research conducted in temperate developed countries has shown that organic farming is superior to conventional farming in resource use efficiency, ecosystem functioning, soil fertility conservation and economic performance but results cannot be transferred directly to the tropics because of disparities in climate, soils and socio-economic environments. A long-term farming systems comparisons experiment was initiated at KARI-Thika in 2006 to assess the contribution of organic agriculture to food security, poverty alleviation and environmental conservation. Four treatments (Conventional High, Conventional Low, Organic High and Organic Low) were imposed in 8m x 8m plots using a randomized complete block design and replicated five times. The 'High' treatments received 118 kgN/ha and 66+5kgP/ha while the 'Low' treatments received 65 kgN/ha and 27 kgP/ha. Conventional treatments received the nutrients from farmyard manure, diammonium phosphate and calcium ammonium phosphate while compost, *Tithonia diversifolia*, and phosphate rock were applied in the organic treatments. Maize variety Pannar was planted at the onset of rains in April 2007 and harvested in August from a net plot area of 6m x 6m. The plots were hand weeded while stock borer was controlled using a Neem extract and ash/soil mixture in organic treatments and Bulldock® in conventional treatments. Stover dry weights were significantly higher in Conventional High than Organic Low (P=0.034) and indistinguishable from those observed in Conventional Low and Organic High. It was reasoned that availability of applied nutrients and the low poorly distributed rainfall received during the flowering and grain filling stages impacted negatively on grain yield.

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**Key words:** Organic, Conventional, Stover, Grain