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## Site-specific Organic and Conventional Crop Yields in a Long-term Farming Systems Comparison in Sub-humid Central Kenya

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### Abstract

Organic farming is increasingly being taken up by farmers and agricultural development agencies in tropics. This is in a bid to improve world food security and rural livelihoods in a sustainable way. Long-term field trial that compares organic and conventional systems was set up in sub-humid central Kenya since 2006 to provide a scientific basis for organic agriculture in the region. The project seeks to gather data on how organic farming affects: yield and yield stability; stability of the agro-ecological system; and natural and economic resource efficiency. The experiments were set up at two sites namely Chuka and Thika. Both sites are at an altitude of 1500 m asl. While Chuka lies in a high potential area with 2000 mm of rainfall and good soil phosphorus availability, Thika has fair yield potential, 1000 mm rainfall and low phosphorus availability. Crop rotations include maize, beans and vegetables.” The trials compares organic and conventional systems at two input levels, namely subsistence and commercial levels, resulting in four treatments: Conventional high input, organic high input, conventional low input and organic low input.

In Chuka, organic yields were on average the same as conventional yields. On the low potential site of Thika, organic yields reached an average 55 % of the conventional yields. Organic yields on the low input level were on average 13 % lower than conventional yields on the low input level. On the high input level, organic yields were on average 26 % lower than conventional yields. Organic maize yields achieved on average 77 % of conventional maize yields, whereas organic brassica yields were 66 % lower than conventional brassica yields. No significant difference was observed between mean organic and conventional legume crop yields.

Our results suggest that: on high potential site of Chuka, organic crops can be grown without yield reduction; on low potential site of Thika, especially if low nutrient availability coincide with low rainfall, considerable yield reductions must be expected in organic systems in the transition phase; low input systems are less sensitive to conversion to organic agriculture than high input systems and relative yield levels in organic systems vary between crops.

**Keywords:** Conventional farming, high input systems and low input systems, organic farming, yield potential