

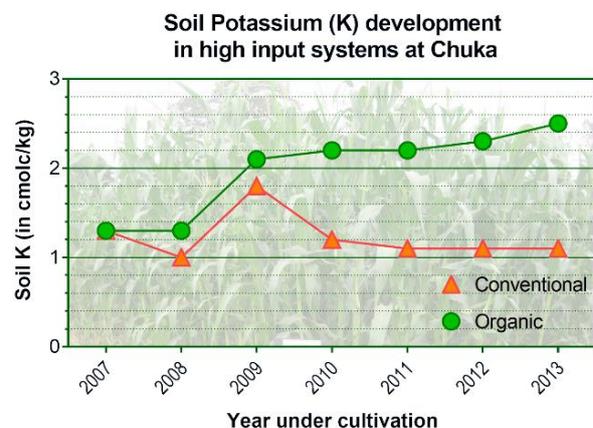
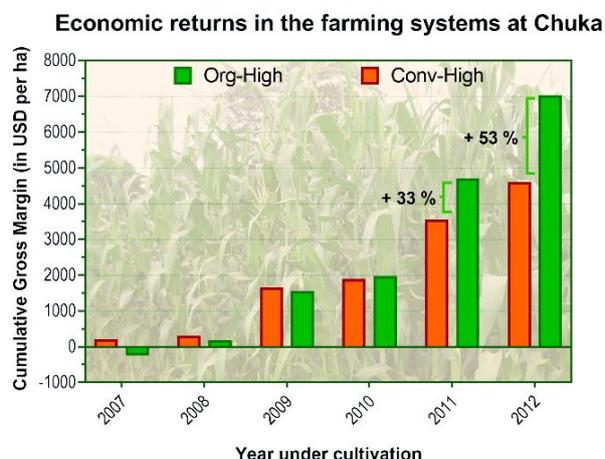
ORGANIC AGRICULTURE IMPROVES PROFITABILITY AND SOIL FERTILITY IN KENYA

First results from a long-term study in Kenya show the potential of organic farming to improve the soil fertility and economic profitability compared to the conventional approach.

The long-term study called “SysCom” compares organic and conventional farming systems under identical conditions. The study lead by the Research Institute of Organic Agriculture (FiBL) Switzerland is implemented in cooperation with local partners in Kenya (International Centre of Insect Physiology & Ecology – icipe, Kenya Agricultural & Livestock Research Organization – KALRO, Kenyatta University - KU, Kenya Organic Agriculture Network –KOAN and Kenya Institute of Organic Farming - KIOF). Permanent field sites are established at two locations in the Central Highlands of Kenya with a sub-humid environment: at Thika and at Chuka. These field trials feature a 6-season-3-year crop rotation with maize and different vegetables and are set up in a way that both organic and conventional farming systems are comparable at high and low input levels, representing commercial scale irrigated and subsistence scale rain-fed farming respectively. In principle, the level of inputs in the low-input treatments reflects the availability of farm-owned resources as a determining factor, whereas in case of the high-input treatments the crop requirements and profitability are main driving factors, necessitating the need for market purchased inputs (e.g. biopesticides for organic) and irrigation water. Thereby, both the field experiments are designed to compare four treatments: Conventional High Input (Conv-High), Organic High Input (Org-High), Conventional Low Input (Conv-Low) and Organic Low Input (Org-Low).

The positive impacts of organic agriculture on productivity and profitability, soil fertility, plant health, biodiversity, resource use efficiency and climate change mitigation have already been established under temperate environments (www.fibl.org>search:DOK). Though, these facts are yet to be proven under tropical conditions and SysCom project aims to fill this knowledge gap by evaluating the performance of different farming systems over long-term. The first results after 6 years show the strong potential of organic and emphasize the need to continue observing the performance in mid and long-term.

Project achievements and findings till date



Productivity and Profitability

- In high-input systems, yields of organic are equal to conventional: The yields of grain maize and baby corn are similar at both sites in all the years except in year one at Thika

- Low input organic systems showed that the yields of maize intercropped with beans in organic were similar to conventional one, while under maize sole cropping at Thika yields were 1.7 to 3.2 times lower in organic compared to conventional
- The high input organic system turns out to be more profitable than high input conventional system after the first four years: Considering the premium price of organic certified products, the gross margin was higher in organic beginning from fourth year.

Soil fertility

- High input organic farming benefitted soil fertility by improving soil parameters like pH, potassium, calcium and magnesium compared to high input conventional farming
- High or low input organic and conventional farming systems have similar effect on soil organic carbon content
- The organic farming systems were more efficient at using nutrients (nitrogen) than conventional for potatoes, and similar for maize and vegetables

Pest and diseases

- No significant differences were found between organic and conventional systems in regards to diseases (Maize Streak Disease, Turicum Leaf Blight and Downey Mildew)
- No significant differences were found between organic and conventional systems in regards to pests (aphids and stemborer). Except at Chuka in 2010, where the stemborers damage was higher in conventional compared to organic system and in 2011 and 2012 where the inverse was observed.
- Despite termite is constantly and significantly more abundant in organic compared to conventional systems, damage due to termite was similar. Except for Thika in 2008 where it was higher in organic compared to conventional.

Context and Significance

About 80 % of Africa's population depends on agriculture as their primary source of livelihood and it provides employment to about 70 % of the Africa's poorest people. The main form of farming in Sub-Saharan Africa (SSA) is simultaneous multispecies mixed farming. In East and Southern Africa, maize based mixed farming is the most important food production system, but the productivity is very low and is considered one of the reasons for the persistence of rural poverty in the region. The low crop productivity has been attributed to a number of factors that include low soil fertility and long-term soil degradation caused by deforestation, overgrazing, continuous and intensified cropping with inadequate replenishing of soil nutrients and a low take up of sustainable resource management strategies. There is a clear need to reverse the decline in soil fertility and the degradation of the natural resources. The first results from the SysCom project demonstrating the potential of organic agriculture make a strong case to implement policy measures necessary for supporting the adoption of organic management practices at large scale.

More information on SysCom as well as graphs and pictures are available on <http://www.systems-comparison.fibl.org/>

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