Crop productivity and contributing factors in organic and conventional farming systems in Kenya
Evidence from a long-term experiment

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Introduction

- Knowledge gap of comparative performance between organic and conventional farming systems in tropics
- Several long-term experiments in temperate regions show organic farming as suitable alternative to conventional
- Research Institute of Organic Agriculture (FiBL) starts long-term experiments in three tropical countries (Kenya, India and Bolivia) in 2007/2008
- Two long-term experiments in Kenya (Chuka and Thika) with different soil fertility and weather conditions

Results

- Yields were higher at Chuka compared to Thika; especially in low input system
  - Maize crops
  - Grain maize sole and inter crop as well as babycorn show generally similar yields in organic and conventional system within each input level
  - Leafy vegetables
  - Cabbage and kale yields were generally higher in conventional systems (+50 resp. 75 %) compared to organic; Swiss chard showed higher yields in organic (+25 %)
  - Leguminous crops
  - French bean yields were mostly higher in conventional systems compared to organic; (+50 %) common beans yielded similar when planted as sole crop; common bean as inter crop yielded higher in organic (+25 %)
  - Potato
  - Potato tuber yields were higher in conventional system compared to organic system within each input level (+50-75 %)

Discussion

- Yield differences can mostly be explained by nutrient, pest and disease and water management of systems
  - High input system perform better than low because of sufficient nitrogen and phosphorous availability and supplementary irrigation
  - Pest and disease incidence in cabbage, kale and potato are main reasons for lower yields in organic systems (- non-effective of bio-pesticides)
  - However, besides the lower vegetable and potato yields in organic system we found positive effects on environmental and human health

Conclusions/Recommendations

- The amount of nutrient applied, the type of water management, and the effectiveness of pest and disease control were the major factors driving crop productivity.
- Similar yields were obtained between organic and conventional farming systems as a result of effective pests and disease, water and nutrient management. This indicate that if the appropriate and adopted best management practices are used, similar productivity is possible.
- The authors recommend the need i) to investigate into the efficacy bio-pesticides/botanicals recommended for organic production, and ii) to explore and integrate other best practices known to reduce pests incidence (e.g. push-pull technology).