Productivity and Growth in Organic Value Chains (ProGrOV)

ADOPTION OF ORGANIC FARMING PRACTICES ENHANCES SOIL NUTRIENT STATUS, YIELD AND MARKETABLE QUALITY OF KALES

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Introduction

Kale is the most consumed green vegetable in both urban and rural areas of East Africa. In Kenya it is grown by 90% of small holder farmers thus providing employment, mostly for women and youth. The economic production of kale is limited by several factors including poor soil fertility and weed interference. To increase kale productivity there is need for improvement in soil fertility and disease management through safe and sustainable methods, such as organic farming practices.

This approach relies on crop rotations, legume cultivation, animal and green manure and off-farm organic wastes and mineral-bearing rocks to feed the soil and supply plant nutrients, in order to maintain sustainable yield production. Practical combinations of cropping systems and organic inputs for optimal soil fertility and yield of kale have not been established.
This study addressed this gap by testing different combinations of cropping systems and organic inputs on soil fertility, kale yield and system sustainability.

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Study Approach

On station experiments were conducted at the University of Nairobi field station. Kale monocrop, kale intercropped with chickpea, with application of farm yard manure (FYM) at the rate of 10 tons/ha and rock phosphate (RP) at a rate of 480 kgha-1 were tested.

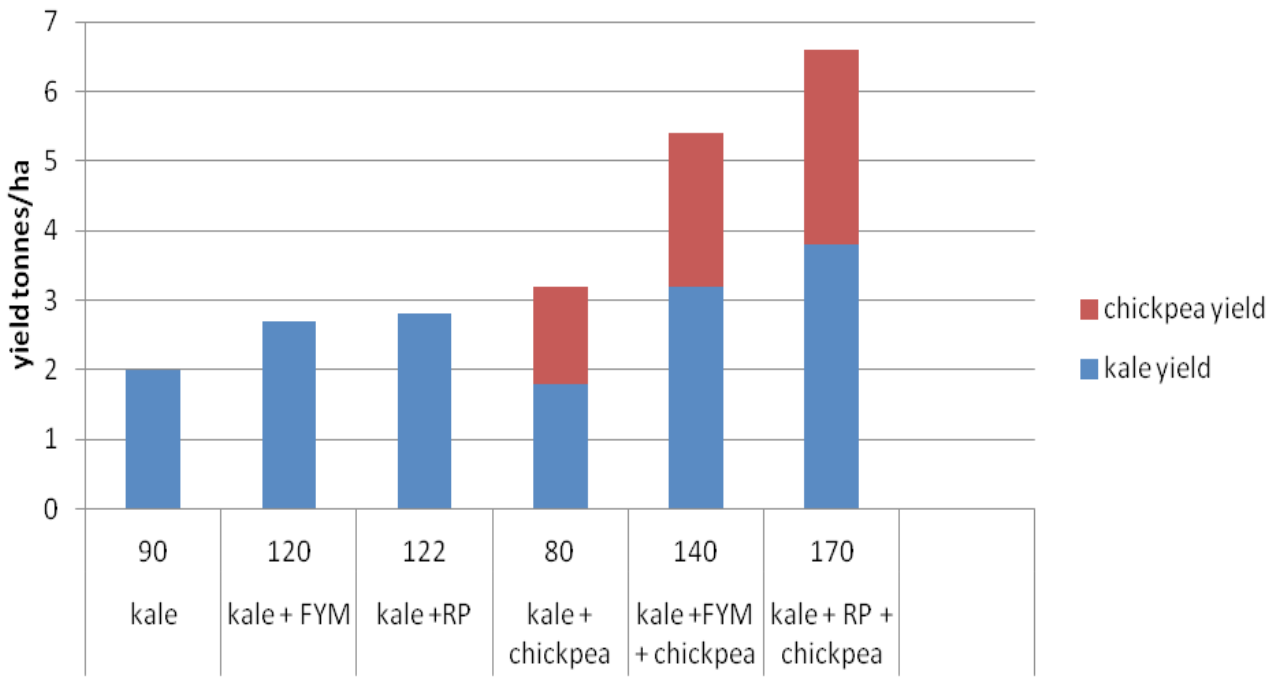

Figure 1: Effect of cropping systems and organic input application on yield of kale

Results

Kale yields and nutrient balances

- Intercropping kale with chickpea with application of FYM and RP led to a 56% and 89% increase in kale yield respectively in comparison to the kale sole crop with no inputs applied (Fig.1)

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- Intercropping kale with of chickpea with application of both RP and FYM led to significantly high nutrient loss after harvest despite them having the highest yield.

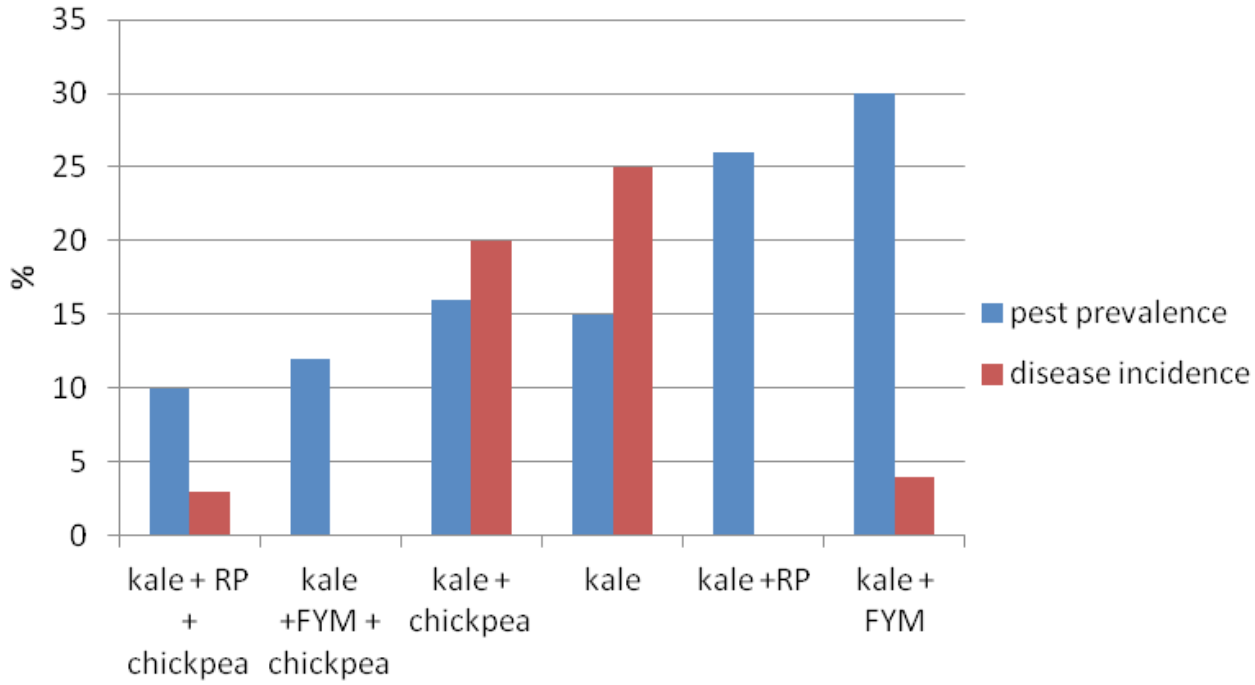

Figure 2: Effect of cropping systems and organic input application on disease incidence and pest prevalence in kale

Disease incidence and pest prevalence

- Integration of chickpea with application of both FYM and RP was able to reduce disease incidences (i.e. downy mildew) significantly, as compared to mono cropping with application of both inputs (Fig. 2).

- Signs and presence pests such as cutworms and aphids were relatively reduced where chickpea was integrated with application of both FYM and RP as compared to monocropping (Fig.2).

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Recommendation

A combination of FYM and Rock P with incorporation of legumes as intercrops, while ploughing the legume residue back into the soil as green manure after harvest will help in improving not only yield and quality, but also sustaining the soil nutrient balances.

Partners
Makerere University, Uganda
University of Nairobi, Kenya
Sokoine University of Agriculture, Tanzania
Aarhus University, Denmark
University of Copenhagen,
Denmark
International Centre for Research in Organic Food Systems (ICROFS), Denmark

Associated partners
National Organic Movement of Uganda (NOGAMU)
Kenya Organic Agriculture Network (KOAN)
Tanzania Organic Agriculture Movement (TOAM)Project

Duration
January 2011-December 2016

Further reading:
The project 'Productivity and Growth in Organic Value Chains (ProGrOV) is funded by the Danish Ministry of Foreign Affairs.

For more information visit:
http://icrofs.dk/en/research/international-research/progrov/

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