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*Strengthening Resilience and Sustainability in
Food Systems for Environmental and Socioeconomic Development*

EFFECTS OF REGENERATIVE SOIL AMMENDMENT PRACTICES ON YIELDS OF AFRICAN LEAFY VEGETABLES IN KENYA

Authors: Koile S., Akollo S., Barasa P., Libaisi J.,

INTRODUCTION

- Consumption of African leafy vegetables (ALV) is increasing.
- ALVs fetch higher incomes smallholder farmers in Kenya.
- Has diverse nutritional and ecosystem benefits
- Very little information is available regarding ALVs best production and management techniques.
- All plants require nutrients to grow well and produce higher yields.

Problem Statement

- Animal manure provides organic acids that facilitate dissolving of soil nutrients and make them available for the plants (Husson, 2013).
- However they are not available in adequate quantities (Tittonell and Giller, 2012).
- Chemical fertilizers also increase leaf yields in vegetables (Ogweno et al., 2015)
- but they are costly, easily leached and out of reach of poor farmers..

MATERIALS AND METHODS

Site description

- Farmers field 4 counties of Kakamega, Bungoma, Uasin Gishu and Nakuru Counties during the short rains of 2022

Experimental design

- Experiments were laid out in RCBD 4 replications.
- Soil amendment practices were evaluated on various vegetables.
- The amendments were: manure 10t/ha, bokashi 6t/ha, DAP 100Kg/ha, NPK 100Kg/ha and DAP 50Kg/ha+ manure 5t/ha.
- The soil amendments were applied in the prepared furrows through placement method and mixed thoroughly with the soils before planting
- Plots measured 2m x 3m with a space of 1m left between plots

Chemical analysis of soil and manure

- A chemical analysis of the soil and manure used for the experiment was performed in order to indicate nutrient levels of the soil and manure at KALRO ALUPE soil laboratory.
- Soil samples were collected from the ploughed land of study at depths of 0-30 cm and 30-60 cm using a soil auger.
- The samples were air dried, crushed and passed through a 2 mm sieve (Jones JB, 2001).
- Analyzed for phosphorous, nitrogen, potassium, sodium, magnesium, calcium, organic carbon and pH according to the procedural methods.

Data Collection and Analysis

- Plants from every plot were used for data collection.
- Data collected included fresh leaf yield, disease incidence, head weight and plant population.
- The term yield in this research was used to include all the edible leaves used for food.
- The harvesting was done at weekly intervals starting 5 weeks after emergence till the fifth harvest was obtained for indigenous vegetables.
- Kales were equally harvested until they reached a time no more could be harvested.
- Cabbages were harvested once upon reaching maturity.
- The weights were recorded in Kg/plot and later converted to kg/ha.

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- Data obtained were subjected to ANOVA using Genstat Version (16th edition) and means separated using least significant difference (LSD) at $P \leq 0.05$.



Planting

RESULTS



Treatment	Black night shade	Cowpea	Spider plant
Biochar	15625	16,667	
Compost	18750	16875	33750
Control	9408.3	11150	6982
DAP	26250	27762	27500
DAP+ Manure	33958.3	21875	20,000
Manure	22355.6	19747	20506
Broadcasted manure			25000
P-value	<.001	<.001	<.001
LSD	4265	4265	4265

Regenerative soil ammenment practices affect the yield of leafy vegetables. Use of manure, *bokashi*, DAP+Manure can substantially increase leaf yields of leafy vegetables.

➤ Chemical characteristics of sampled field soils per county

Parameter	Critical Levels	Uasin Gishu	Kakamega	Bungoma	Nakuru
pH	5.50-7.50	5.25	5.69	5.16	5.38
Nitrogen %	0.30-0.50	0.33	0.22	1.78	0.18
P (ppm)	10.00-25.00	19.39	23.88	20.74	29.85
K cmol/kg	0.50-0.80	0.72	0.37	0.67	0.42
C %	≥3.5	0.78	0.70	0.71	0.71
Ca cmol/kg	1.00-3.00	1.83	2.23	1.70	2.15
Mg cmol/kg	0.50-1.50	1.03	1.38	0.90	1.05
Cu cmol/kg	≤2.0	1.00	1.00	1.13	1.00



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Thanks!

ANY QUESTIONS?

You can find me at

• @username

• user@mail.me

