Green and animal manure (GAM) agricultural technologies: alternative soil fertilisation technique in Kenya

Duba Golicha [1], Joan Abwao[2], Miriam Nyokabi[3]

[1] *Kenya Agricultural and Livestock Research Organization, Environment and Natural Resource Management, Kenya*

[2] *Kenya Agricultural and Livestock Research Organization, Environment and Natural Resource Management ,*

[3] *Kenya Agricultural and Livestock Research Organization, Environment and Natural Resource Management ,*

Abstract

The decline of soil fertility threatens smallholder agriculture in Kenya's Central Highlands. This study examines current soil management practices and the potential for adopting Green and Animal Manure (GAM) technologies among farmers in Nyandarua, Nakuru and Murang'a Counties of Kenya. A cross-sectional survey of 139 households were selected using Cochran's formula and stratified random sampling. Structured face-to-face interviews were conducted. The data collected was on demographics, land use, crop and livestock patterns, soil fertility strategies, GAM awareness and willingness to adopt. The results showed a male-dominated (58.3 %) and older (mean age 54 years) farming population with relatively high education levels (48.2 % secondary education and 24.5 % college/university education). The average farm size was 2.7 acres, predominantly cultivated with maize, beans, potatoes, tea and coffee as key crops and cattle and poultry as main livestock species. The possession of both crop and livestock enterprises present opportunity for manure use and composting for soil health intervention. However, soil fertility relied heavily on inorganic fertilisers (48.4 %). Animal manure use stood at 47.7 %, while green manure use remained very low (6.5 %). GAM awareness stood at 49.6 %, with significant county variation (highest in Nakuru County). Farmers strongly perceived GAM as suitable for improving soil health and crop yields. The green manure species ranked highest include desmodium, faba bean, and lucerne. The willingness to adopt GAM and reduce chemical fertilisers reached 94.2 %. The major barriers to adoption of GAM technologies include labour intensity and knowledge gaps. The study concludes that GAM technologies hold strong potential to reduce chemical fertiliser dependency and enhance sustainability. Targeted capacity building, community composting initiatives and policy support are recommended to accelerate adoption of green and animal manure technologies. The adoption of green and animal manure technologies contribute to climate-resilient agriculture in Kenya.

Keywords: Agriculture, farmers, manure, Soil

Contact Address: Duba Golicha , Kenya Agricultural and Livestock Research Organization, Environment and Natural Resource Management, Kaptagat rd, 00200 Nairobi, Kenya, e-mail: golichdub@yahoo.com