

## Abstract

Okra is a vegetable belonging to *Malvaceae* family mainly grown for its pods which are used fresh, canned or dried and ground as powder. Okra farmers use inorganic fertilizers which are expensive, increasing the cost of production, they result to water pollution, increases the soil acidity, which affects soil nutrients availability and uptake as well as reducing microbial activity and making production unsustainable for small scale farmers. Organic manure improve soil physical, chemical and biological properties, and are environmental friendly. However, farmers have limited information on the utilization of these organic manure sources on growth yield, quality and net economic benefit of okra. A study was conducted to determine the effects of rate cattle, goat and poultry manure on okra growth, yield, quality and net economic benefit at KALRO-Kandara Centre in Murang'a County between 2018 and 2019. The experiment was laid out in randomized complete block design with three replications for two cultivations. There were 10 treatments, i.e., 0, 3, 6 and 7 ton ha<sup>-1</sup> for cattle and goat manure, and 0, 3, 5 and 7 tons ha<sup>-1</sup> poultry manure. The manure treatments were applied before planting and okra variety Pusa Sawani was used during the experiment. Data collected included growth characteristics (number of leaves, plant height, number of branches, total biomass and the crop stand at the end of growth season), yield characteristics (number of pods per plant, total fresh pod yield and total dry pod weight) and quality characteristics mainly total soluble solids (TSS). Data collected was subjected to analysis of variance using SAS statistical software version 9.4 and significantly different means were separated using LSD at  $\alpha = 0.05$ . The results showed that there was significant effect of treatments ( $p < 0.05$ ) on growth, yield, quality and net economic benefit of okra. Poultry manure at the rate of 5t ha<sup>-1</sup> recorded best growth characteristics and yield while control the least. Goat manure at the rate of 6 tons ha<sup>-1</sup> recorded the highest total soluble solids, hence, produced pods of the highest quality of 3.18°Brix and 3.21°Brix for Trial 1 and Trial 2, respectively, whereas the control produced pods of lowest quality of 2.31°Brix and 2.34°Brix for Trial 1 and Trial 2, respectively. Cattle manure at the rate of 6 tons ha<sup>-1</sup> recorded the best net economic benefit of Ksh. 700,267 in Trial 1 and Ksh. 694,320 in Trial 2, while the control gave minimal returns of Ksh. 69,158 in Trial 1 and Ksh. 64,320 in Trial 2. This indicates an increase of net economic benefit of Ksh. 631,109 in Trial 1 and Ksh. 630,000 in Trial 2 for cattle manure compared to the control. The results of this study clearly indicate that in okra production, application of different types of animal organic manure can improve the productivity of the okra. The study recommends application of 5 tons ha<sup>-1</sup> poultry manure, or 6 tons ha<sup>-1</sup> of goat or cattle manure for best growth, yield, quality and net economic benefit of okra.