

**PERFORMANCE OF VERMICOMPOSTED WASTES FOR TOMATO
(*Lycopersicon esculentum* MILL.), PRODUCTION AT THE UNIVERSITY
OF EMBU**

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THESIS ABSTRACT

Organic waste management is vital in minimizing municipal, domestic and industrial wastes. The general objectives for this study were to vermicompost organic wastes and assess their influence on tomato performance in the University of Embu. The study was conducted for two seasons between November 2018 and June 2019. The vermicomposting experimental design was completely randomized with vermicomposted kitchen, municipal market and tea factory wastes as treatments, replicated thrice. The tomato performance experimental treatments were vermicomposted kitchen, municipal market, tea factory wastes, inorganic fertilizer (NPK) and a control, replicated thrice. Vermicompost was applied to supply an equivalent of 0.124 tonnes N ha⁻¹. Data obtained was analysed using SAS version 9.4 by subjecting to one-way Analysis of Variance (ANOVA). The vermicomposting experiment means were separated using least significant difference (LSD) at p=0.05 significance level. Biophysical crop data means were separated using Tukey's Studentized Range (HSD) test at p=0.05 significance level. T-test was used to determine the difference in soil nutrient content at the beginning and end of the study. The benefits and costs were analyzed using the benefit-cost ratio formula. Kitchen waste vermicomposts had the highest vermicomposting rate of 0.6 kg/day. Kitchen and market waste vermicomposts gave a high earthworm count of 676 and 612 earthworms per kilogram of vermicompost compared to tea waste vermicompost. Tea waste vermicompost applied at a rate of 12.22 t ha⁻¹ and kitchen waste vermicompost applied at 22.22 t ha⁻¹ gave significantly high tomato yields of 115 t ha⁻¹ and 113 t ha⁻¹ at p=0.0001, respectively. Tea waste vermicompost gave the highest benefit-cost ratio of 1.45:1. The study concluded that tea, market and kitchen wastes have a potential for use in production of high quality vermicompost that can be used as a soil amendment to enhance tomato performance. The study recommends use of tea, market and kitchen wastes vermicompost for tomato production compared to inorganic fertilizers.