

**EVALUATING THE INTEGRATION OF VERMICOMPOST WITH  
SYNTHETIC FERTILIZER ON COWPEA**

*(Vigna unguiculata L.)*



By

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**2026**

## ABSTRACT

Cowpea (*Vigna unguiculata* L.) is a major grain legume with high nutritional and economic value. Soil fertility and nutrient management are key factors for maximizing growth and yield. The main objective was to evaluate the impact of Vermicompost and Vermicompost combined with Synthetic Fertilizer on the growth, yield and quality of Cowpea in the tropical dry zone of Batticaloa, Sri Lanka. The experiment was conducted from August to November, covering the late Yala dry period to the onset of the Northwest Monsoon. Six treatments were applied. T1 (25% VC + 75% SF), T2 (50% VC + 50% SF), T3 (75% VC + 25% SF), T4 (100% SF), T5 (100% VC) and T6 (Control). Growth parameters, reproductive traits and grain yield were measured under these treatments and analyzed using ANOVA in Minitab 17. Treatments with higher proportions of Vermicompost significantly enhanced vegetative growth. The highest plant heights were observed in T2 (23.50 cm), T5 (23.43 cm) and T3 (22.50 cm) at 6 week after planting. The maximum number of leaves was observed in T2 and T5 with 15.633 leaves. The highest number of nodes was recorded in T5, with 5.933 nodes at 8 week after planting. The most branches were observed in T4 and T5 with 4.533 and 4.467 branches respectively. The trifoliolate leaf size of the fifth leaf was largest in T5 measuring 41.16 cm<sup>2</sup>. Earliest flowering occurred in T5, T2 and T4, within 36-37 days after sowing. Reproductive parameters also improved with Vermicompost-based treatments with the maximum number of pods in T5 (3.800 pods/plant). The highest pod length in T2 (13.600 cm) peak 100-grain weight in T2 (13.167 g) greatest dry pod weight in T3 (72.90 g) and the highest grains per pod in T1 (9.733 grains). Grain yield was highest in T5 with 0.5234 t ha<sup>-1</sup>, T3 with 0.4521 t ha<sup>-1</sup> and T2 with 0.4346 t ha<sup>-1</sup>. Overall, the study shows that Vermicompost alone or combined with synthetic fertilizer increases soil fertility, vegetative growth and yield in cowpea. Based on these results, T5 (100% VC) is recommended as suitable for sustainable cowpea production in tropical dry-zone conditions.

**Keywords:** Cowpea, Growth Parameter, Soil Fertility, Synthetic Fertilizer, Vermicompost

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