

**EFFECT OF SMALL ONION PEEL EXTRACT ON THE
GROWTH AND YIELD OF COWPEA**



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ABSTRACT

Cowpea (*Vigna unguiculata* L. Walp.) is a significant food and grain legume in the semi-arid tropic. It holds significant agronomic importance due to its adaptability to various environmental conditions, resilience to pests and diseases, and nutritional value. Small onion peels are utilized to produce organic potassium-rich fertilizer for the cultivation of crops. Hence, this experiment was carried out to study the effect of a small onion (*Allium cepa* L.) peel extract as a soil application on the growth and yield of cowpeas. It was designed in a completely randomized design with six treatments applied with six replications each, including a control (T1) with no extract and treatments with 20 % (T2), 40 % (T3), 60 % (T4), 80 % (T5), and 100 % (T6) onion peel extract. The soil application of a small onion peel solution had a significant ($P < 0.05$) effect on the growth and yield of cowpeas when compared to the control treatments. The results indicated that cowpea plants treated with 60 % onion peel extract (T4) exhibited superior growth parameters and yield compared to other treatments. Specifically, plants in T4 showed significant increases in plant height, number of leaves, number of branches, number of pods, pod length, seed yield, and overall biomass production. Conversely, higher concentrations (T5 and T6) did not significantly enhance growth and yield, suggesting a possible negative impact at excessive concentrations. T4 has a high amount of potassium organic fertilizer; that's why these findings underscore the potential of 60% onion peel extract as an effective bio stimulant for enhancing cowpea productivity. I discuss the implications of these results for sustainable agriculture and natural resource management. Additionally, the use of onion peel extract as an organic soil amendment offers an eco-friendly and cost-effective alternative to synthetic fertilizers. Based on the results, it is recommended that a small onion peel solution at a 60% concentration (60 ml of extract and 40 ml of distilled water) be applied to cowpea crops at two-week intervals, and 0.247 g of urea and 0.7071 g of triple superphosphate were applied as basal fertilizer for all treatments.

Keywords: Compost, cowpea, small onion peel solution, soil application, yield

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