

COMPARATIVE EVALUATION OF WATER HYACINTH, VEGETABLE WASTE AND GLIRICIDIA AS NITROGEN SOURCES FOR COMPOSTING PADDY HUSK

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Paddy husk is one of the most widely produced agricultural wastes in rice production. The co-composting of paddy husk is an effective method for addressing this waste issue. This study aimed to transform ordinary paddy husk into high-quality compost using water hyacinth (*Eichhornia crassipes*), vegetable waste, and gliricidia (*Gliricidia sepium*) as nitrogen sources. The quality of the compost was compared using pH, electrical conductivity (EC), organic carbon (C), total nitrogen (N), available phosphorus (P), and exchangeable potassium (K). The experiment followed a Completely Randomized Design (CRD) with four treatments: T1 = paddy husk only, T2 = paddy husk + water hyacinth, T3 = paddy husk + Gliricidia, and T4 = paddy husk + vegetable waste, mixed in a 1:1 ratio. The mixtures were aerobically decomposed using the compost pile method and analysed after 67 days. The results were compared with the compost standards provided by the Sri Lanka Standards Institution. A pot experiment was conducted to evaluate the effect of the prepared compost on the growth of water spinach (*Ipomea aquatica*). The pH values of all trials ranged between 6.5 and 7.9, and EC values ranged from 0.13 dS/m to 0.977 dS/m. The T2 compost mixture (paddy husk + water hyacinth) showed significantly higher ($p < 0.05$) levels of total nitrogen ($1.15\% \pm 0.03$) and potassium ($0.466\% \pm 0.01$) compared to other mixtures. The T3 compost mixture (paddy husk + gliricidia) exhibited the highest phosphorus level ($1.33\% \pm 0.08$). Low potassium levels were consistent across all compost mixtures. Considering the pH, EC, total nitrogen, and phosphorus levels obtained for the T2 mixture (pH 7.96, EC 0.977 dS/m, N 1.15%, and P 1.257%), along with the highest fresh weight ($6.836\text{g} \pm 0.373$) and dry weight ($0.6075\text{g} \pm 0.037$) of plant samples from the pot experiment, the compost mixture containing paddy husk and water hyacinth was found to be the most suitable for field application.

Keywords: Compost, Gliricidia, Paddy husk, Vegetable waste, Water hyacinth