

POTENTIAL OF USING GUINEA GRASS AS A RAW MATERIAL FOR COMPOST PRODUCTION

H.G.S Sandaruwani¹, M.G.T.S Amarasekara¹, D.M.D Dissanayake², and
J.P.H.U Jayaneththi¹

¹Department of Agricultural Engineer and Soil Science, Faculty of Agriculture,
Rajarata University of Sri Lanka, Anuradhapura, Sri Lanka.

²Department of Plant Sciences, Faculty of Agriculture, Rajarata University of Sri
Lanka, Anuradhapura, Sri Lanka.

Guinea grass (*Panicum maximum*) is a fast growing and widely distributed grass specie found in all over the country which is very difficult to control. Hence, a study was carried out to determine the potential of using guinea grass as a material for compost production as control method. Six different combinations of guinea grass and other materials were prepared as follows: fresh guinea grass, cattle manure (T₁), guinea grass, poultry manure (T₂), guinea grass, cattle manure, poultry manure (T₃), guinea grass, cattle manure, rock phosphate (T₄), guinea grass, poultry manure, rock phosphate (T₅), guinea grass and *Gliricidia sepium* (T₆). The compost heaps were prepared in the field according to Randomized Complete Block Design with three replicates. The mixtures were allowed to decompose for 12 weeks by mixing in once a month. The moisture content of all treatments was maintained at required level (40%- 60%) to facilitate microbial decomposition. After preparation of compost, the final mixtures were analysed for pH, EC, organic C, total N, P, K, and Ca. The pH values of all treatments were within the permissible range. There was a significant difference ($p < 0.05$) of organic C. The highest organic C percentage of 69% was reported in T₆, while the lowest value of 25% was shown in T₂. The total N varied from 1- 1.2% but no significant difference was observed ($p < 0.05$). The total P also significantly varied among treatments ($p < 0.05$). Three treatments, T₂, T₃ and T₅ showed significantly higher available P compared to control ($p < 0.05$). The highest C: N ratio of 58:1 was reported in T₆ and the lowest ratio of 23:1 was reported in T₂. Significantly high K content was reported in T₂, T₃ and T₆ ($p < 0.05$). No weed seed germination was observed in quality evaluation test performed for final products of all treatments. Comparing C: N ratio (23:1) and other available nutrients, T₂ was the most suitable combination to produce compost. However, further studies are needed to assess heavy metal content and cost benefit analysis of different treatments.

Keywords: Compost, C: N ratio, Guinea grass, Microbial decomposition