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Impact of Co-Compost Pellets on Growth and Yield of *Ipomoea batatas* and *Eleusine coracana*

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Abstract

Dewatered Fecal Sludge (DFS) and organic Municipal Solid Waste (MSW) co-compost pellets have a high potential as an agricultural resource in Sri Lanka while elevating deficient MSW management. Three studies had been conducted to explore the importance of formulation and placement depth of these pellets. Using *Ipomoea batatas* one field study was carried out with biochar derived from empty fruit bunches of oil palm as additive to co-compost pellets to amend sandy loam soil and to evaluate its performance on the plant growth and yield. Two studies were conducted to investigate the response of growth and yield of *Eleusine coracana* to different dosages and application depths of co-compost pellets under greenhouse conditions. The experiment of *Ipomoea batatas* tested seven pelletized treatments, namely MSW-DFS 30 % available nitrogen (N), MSW-DFS 100 % available nitrogen, MSW-DFS-biochar 30 % available nitrogen, MSW-DFS-biochar 100% available nitrogen, MSW-DFS-N enriched, MSW-FS-biochar N enriched, and a control with mineral fertiliser recommended by Department of Agriculture (DOA), Sri Lanka were used. The results revealed a significantly higher yield with MSW-DFS pellets (30 % available nitrogen) and MSW-DFS-biochar pellets (30 % available nitrogen) treatments against the recommended mineral fertiliser. It could be concluded that, harvest of 15 to 19.5 tons ha⁻¹ could be achieved by amending soil with 16.8 tons ha⁻¹ of MSW-DFS-Biochar pellets with 30% available Nitrogen. In *Eleusine coracana* trials, plots were laid according to Latin Square Design in a greenhouse. Eight different dosages of pellets based on available Nitrogen (10 %, 30 %, 50 %, 70 %, 90 %, 110 %, 130 % and 150 %) were applied as treatments with DOA recommended mineral fertiliser as the control in the dosage response trial. In the application depth trial, co-compost powder and pellets were applied at four different soil depths. Depth of application did not have any effect on growth and yield of *Eleusine coracana*. However, application of DFS-MSW co-compost recorded significantly higher growth and yield performance (63 % higher) compared to inorganic fertiliser. These results concluded that increased yield can be achieved with surface application of co-compost pellets with volumes that just cover 30 % of the mineral nitrogen demand.

Keywords: Biochar, co-compost, *Eleusine coracana*, *Ipomoea batatas*, pellets

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