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Effect of two Forms of Co-compost Applied at Different Soil Depths on Eleusine Coracana

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Abstract

Form and placement depth are two important factors of fertiliser application, which affect the efficiency of nutrient up take by plants. It consequently encourages maximum yields of intensively managed agronomic crops by improving soil fertility and quality. The objective of this study was to investigate how different application depths of co-compost pellets and powder affect the growth and yield of finger millet (*Eleusine coracana*) over inorganic fertiliser. Co-compost powder and pellets, made using Dewatered Fecal Sludge (DFS) and Municipal Solid Waste (MSW) were used at four different soil depths; surface application, 10 cm shallow incorporation, bottom layer application and complete soil mixture over inorganic fertiliser. Experiment was setup in Latin Square Design with nine treatments in a poly house at the Faculty of Agriculture and Plantation Management, Wayamba university of Sri Lanka. Plant vegetative and yield parameters along with soil pH were recorded. The results revealed that depth of co-compost application did not have any effect on growth and yield of finger millet or soil pH. Significantly ($p < 0.05$) higher yield could be obtained in the DFS-MSW co-compost powdered form than pellet form. A grain increment of 49 % was recorded in powder form over the pellet form. Application of DFS-MSW co-compost recorded significantly ($p < 0.05$) higher growth and yield performance (63 % higher) compared to inorganic fertiliser. Further, co-compost resulted a significant improvement of soil pH over inorganic fertiliser. Use of co-compost can be recommended based on improvement of soil pH from 6.35 to 6.99. These results preliminarily suggested that 10 cm deep fertilisation can be recommended in actual farming of finger millet considering the convenience and reduction of cost of fertiliser application at shallow depth than deep layers. Further research is suggested to identify the effect of DFS-MSW co-compost with other crops under field conditions in different climatic zones of Sri Lanka.

Keywords: Co-compost, Depths, Finger millet, Pellets, Powder