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Performance of nitrogen enriched compost pellets on growth of *Oryza sativa* L. in Sri Lanka

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Abstract

Paddy is occupying almost 34 percent of the total cultivated area in Sri Lanka where rice is the staple food. Urea is the main Nitrogen source in paddy cultivation and Nitrogen loss is one of the major problems faced by paddy farmers in Sri Lanka. Controlling the nitrogen releasing behaviour of fertiliser is an effectual way of mitigating this problem. Compost pellets rich in Nitrogen have a high potential to reduce Nitrogen depletion and enhance crop growth performance. An experiment was conducted to evaluate the performance of rice (*Oryza sativa* L.) supplied with nitrogen-enriched compost pellets. As the nitrogen source, $(NH_4)_2SO_4$ was used instead of urea to avoid practical difficulties during pelletizing. Plant growth and yield parameters were measured to assess the effect of pelletized forms of seven different organic amendments in the combinations of 70 % Compost + 30 % Fish Tonic Based Liquid Fertiliser + Biochar; 70 % Compost + 30 % Fish Tonic Based Liquid Fertiliser; 70 % Compost + 30 % $(NH_4)_2SO_4$; 70 % Compost + 30 % Biochar and 100 % Compost in comparison with the inorganic fertiliser recommendation of Department of Agriculture (DOA) in Sri Lanka as a controller for three months rice variety (BG 300). Treatments were arranged in a Latin Square Design including four replicates in 0.675 m^3 plots. According to the SAS statistical analysis, some vegetative parameters (Plant height, number of leaves) recorded in 70 % Compost + 30 % $(NH_4)_2SO_4$ pellets treatment were significantly higher than the DOA recommended inorganic fertiliser treatment. The total yield was recorded as 1.30 kg per plot and 2.29 kg per plot in DOA recommended treatment and 70 % Compost + 30 % $(NH_4)_2SO_4$ pellet treatment respectively. The number of panicles and the total yield of these treatments suggested that, 70 % Compost + 30 % $(NH_4)_2SO_4$ pellet treatment can produce a high yield than the DOA recommended inorganic fertiliser. Production of nitrogen-enriched compost pellets by incorporating $(NH_4)_2SO_4$ could address various drawbacks related to Nitrogen loss by controlling the nitrogen releasing behaviour of fertiliser effectively.

Keywords: Biochar, nitrogen enriched compost pellets, pelletisation

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