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Impact of rice husk charcoal application on soil properties and growth and yield of rice

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Abstract

Fertilizer application in rice farming is an indispensable requirement. Most of the high yielding varieties which are extensively grown throughout the country require recommended levels of fertilizers in order to obtain their potential yields. Therefore, effective and efficient ways of fertilizer application are important. Coated fertilizers are used to improve the efficiency of fertilizer. However, the conventional coated fertilizers such as sulphur coated urea and urea super granules are not popular among the rice farmers in Sri Lanka owing to high cost of the coated fertilizers. One of the most sustainable solutions is application of paddy husk charcoal as a coating material to absorb N fertilizer which release nitrogenous compounds and making them available for plants. Objective of this study was to evaluate paddy husk charcoal coated urea as a slow releasing fertilizer and compare the total N and organic matter in soil and yield of paddy production. A pot experiment was carried out at Meewathura Research field in Yala 2010. Five treatments were used for twenty pots each replicated 4 times, chemical fertilizer only (Treatment 1), paddy husk charcoal coated urea only (Treatment 2), chemical fertilizer with paddy straw compost only (Treatment 3), rice husk charcoal urea with rice straw compost (Treatment 4) and no fertilizer as the control (Treatment 5). One third of urea from the recommended fertilizer was used for the treatment 2 and 4. The soil sampling was done once a week for three months period. The mean total dry biomass for treatment 4 was significantly higher than the means for all other treatments. Considering treatment 2 and 4, rice grain yield was significantly greater in treatments 4 (charcoal coated urea with rice straw compost). Therefore, using charcoal coated urea reduce the two third of urea usage and save 70% fertilizer cost. rice husk charcoal coated urea can potentially be used as a slow releasing nitrogen fertilizer which reduces leaching losses of urea.

Key words: Charcoal, slow releasing N fertilizer, coated fertilizers, compost