

EVALUATION OF RICE MILL FURNACE APPLICATOR FOR INCORPORATION OF RICE HUSK ASH AS AN ORGANIC SOIL AMENDMENT IN RICE FARMING

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Rice husk ash (RHA) is a silica-rich byproduct generated from burning rice husks, as a fuel for boilers. Many countries use RHA as a soil amendment in rice cultivation due to its positive effect on nutrient uptake, reducing biotic and abiotic stresses, and improving photosynthetic efficiency in rice plants. Presently, there are no any applicators available for incorporating RHA into the rice soil in Sri Lanka. Therefore, a Rice Mill Furnace Applicator (RMFA) was designed with major components such as a hopper, metering mechanism, delivering mechanism, and frame. A riding-type two-wheel tractor was used as the power source for the RMFA. A comparative performance evaluation was conducted in Low Humic Gley (LHG) soils at the research unit of the Faculty of Agriculture, Rajarata University of Sri Lanka. In the comparative evaluation, the treatments used were control, manual application of RHA and RHA was applied to the rice fields using RMFA with three replicates. The tractor was operated at a speed of 0.833 ms⁻¹ by a skilled operator. The same conditions were supplied to the research fields except RHA applying methods. Data indicated that the RMFA achieved a field efficiency of 77.12% when compared to the manual broadcasting efficiency of 49.97%. The RHA application time using RMFA was 11 minutes while the manual method was taken 25 minutes for the same application. Significant differences were observed in rice plant growth height with RHA applying RMFA compared to manual broadcasting and control. These comparative results show applying of RHA from using RMFA was better than other methods. This indicates incorporation of RHA into the soil is more effective using RMFA compared to manual application in paddy cultivation. The longer time application of RHA in this method with other usual fertilizers can increase more benefits.

Keywords: Rice cultivation, Rice husk ash, Soil amendment