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COMPARATIVE STUDY OF CROP ESTABLISHMENT METHODS FOR RICE CULTIVATION IN THE BATTICALOA DISTRICT



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2026

ABSTRACT

Rice productivity in Sri Lanka's Dry Zone is strongly influenced by the choice of crop establishment method, particularly under conditions of labour scarcity, variable water availability, and increasing demand for resource-efficient production. This study evaluated the agronomic performance, efficiency, and overall sustainability of three major establishment methods: parachute planting, conventional transplanting, and seed sowing using the Bg 374 variety under field conditions in the Batticaloa District. A randomized field experiment was conducted from July to November, 2025, and key growth and yield parameters, including plant height, tiller number, panicle number, root length, and grain yield, were measured and analysed using ANOVA and Tukey's mean separation at the 5% significance level. Results showed that the parachute method consistently produced superior vegetative and reproductive performance, with significantly higher tiller numbers, root length, and plant height compared with seed sowing, and performance comparable to or better than transplanting. Importantly, the parachute method achieved the highest grain yield (6.90 t ha^{-1}), significantly outperforming both transplanting (4.97 t ha^{-1}) and seed sowing (4.64 t ha^{-1}). While traits such as panicle length and filled spikelets' count did not differ significantly among methods, yield-contributing factors clearly favoured the parachute technique. The findings indicate that parachute establishment offers the most balanced combination of productivity, labour efficiency, and adaptability to Dry Zone conditions, making it a promising alternative for enhancing rice cultivation sustainability in eastern Sri Lanka.

Keywords: Agronomic performance, Parachute planting, Seed sowing, Sustainable rice cultivation, Transplanting

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