

EFFECT OF ORGANIC AND INORGANIC FERTILIZER COMBINATIONS ON GROWTH AND YIELD OF RICE (*Oryza sativa* L.)

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Soil fertility depletion is a major constraint for low productivity of rice in Sri Lanka. A suitable combination of organic and inorganic fertilizers is necessary for sustainable rice production. A field experiment was conducted during *Maha* season of 2011/2012 at the Research Farm, Faculty of Agriculture, Rajarata University of Sri Lanka to study the effect of application of organic and inorganic fertilizer combinations on growth and yield of traditional and new-improved rice varieties. The Experiment was laid out in a split-plot design with 3 replicates. Rice varieties *Bg 352* and *Kaluheenati* were used as main plot factor. Sub-plot treatments were T₀: control (without fertilizer and organic manure), T₁: Department of Agriculture (DOA) recommended inorganic fertilizer for 3½ month varieties, T₂: 50% of DOA recommended inorganic fertilizer, T₃: 4000 kg ha⁻¹ Rice straw + 6000 kg ha⁻¹ *Gliricidia* leaves + 350 kg ha⁻¹ Eppawala Rock Phosphate + 600 l ha⁻¹ *Gliricidia* leaf extract (applied fortnightly), T₄: Organic manure combination +50% of DOA recommended inorganic fertilizer. Plant growth, grain yield and biological yield were significantly influenced by different treatments. Plant height was highest in T₁ irrespective of the variety. The highest biological yield of *Kaluheenati* was recorded in T₄ while that of *Bg-352* was in T₁. In both varieties T₁ and T₄ showed identical results in terms of biological yield. In *Kaluheenati*, highest yield of 5.97 t ha⁻¹ was observed in T₂, followed by T₄ (5.45 t ha⁻¹), T₁ (5.31 t ha⁻¹), T₃ (5.09 t ha⁻¹) and T₀ (3.8 t ha⁻¹), respectively. Interestingly, the combination of ½ DOA with organic fertilizers (T₄) resulted a substantially higher yield. Application of either inorganic or organic fertilizers showed a positive effect on grain yield of variety *Kaluheenati*. The highest yield of *Bg 352* was observed in T₁ (7.86 t ha⁻¹), which was similar to the yield obtained by combining of inorganic fertilizers and organic fertilizers *i.e.* T₄ (7.68 t ha⁻¹). Yield obtained from T₄ indicated the potential of using organic fertilizer in combination with lesser amounts of inorganic fertilizer towards higher yields.

Key words: Fertilizer, Growth and yield, *Maha* season, Organic manures, Rice varieties