

## POSSIBILITY OF REPLACING INORGANIC FERTILIZER BY ORGANIC SOURCES IN LOWLAND RICE

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High inorganic fertilizer use is a major constrain for lowland rice production in Sri Lanka. A suitable combination of inorganic fertilizers and organic manures is necessary for sustainable rice production and reduction of harmful effects caused by inorganic fertilizers. A field experiment was conducted to evaluate the possibility of replacing inorganic fertilizers by organic manures in lowland rice during *Maha* season 2015/2016 at research unit of Faculty of Agriculture, Rajarata University of Sri Lanka, Anuradhapura. The experiment was laid out in an incomplete block design with four replicates. Plot size was 4 m × 5 m. Newly improved rice variety Bg 300 was used to evaluate fertilizer/manure combinations. The experiment consisted of five treatments viz., T<sub>1</sub> - control, T<sub>2</sub> - 5 t/ha cattle manure + 4 t/ha rice straw, T<sub>3</sub> - 100% DOA inorganic fertilizer recommendation (103.5 kg/ha N, 25.3 kg/ha P<sub>2</sub>O<sub>5</sub>, 36 kg/ha K<sub>2</sub>O, 5kg/ha ZnSO<sub>4</sub>), T<sub>4</sub> - T<sub>2</sub> + 50% DOA inorganic fertilizers recommendation, T<sub>5</sub> - T<sub>2</sub> + 75% DOA inorganic fertilizers recommendation. Urea, Triple Super Phosphate and Muriate of Potash were used as inorganic fertilizers. Plant growth parameters, yield and yield components were measured. Results revealed that the effect of integrated nutrient management (INM) on tillering, shoot biomass accumulation and leaf area index at 80% heading, number of panicles/m<sup>2</sup>, number of spikelets/panicle and yield was significant ( $p < 0.05$ ). The highest grain yield (7.10 t/ha) was found in T<sub>5</sub>, which was similar to the yield of T<sub>3</sub> (7.04 t/ha). Thousand grain weight was not significantly different among treatments ( $p > 0.05$ ). INM showed a positive effect on grain yield, however, the prominent effect was observed in the combination of 75% DOA inorganic fertilizers and organic manures. Overall results indicated that there is a possibility of replacing 25% inorganic fertilizers by organic manures (5 t/ha cattle manure + 4 t/ha rice straw) without declining the present yield level of newly improved rice variety Bg 300.

**Keywords:** Inorganic fertilizer, Cattle manure, Rice straw, Integrated nutrient management