

Residual effects of organic manures with different levels of chemical fertilizers on rice

ABSTRACT

A field experiment was conducted to evaluate the residual effects of organic manures and different level of recommended fertilizer dose (RFD) on the yield and nutrient uptake of BBRI dhan29 at the Soil Science Field Laboratory of Bangladesh Agricultural University, Mymensingh, Bangladesh. The experiment containing seven treatments were laid out in a randomized complete block design with three replications. The treatments were T0 (Control), T1 (100% RFD), T2 (75% RFD + residual effect of CD 5 t ha⁻¹), T3 (75% RFD + residual effect of PM 3 t ha⁻¹), T4 (75% RFD + residual effect of residual effect of Com. 5 t ha⁻¹), T5 (75% RFD + residual effect of CD 2.5 t ha⁻¹, PM 1.5 t ha⁻¹, and Com 2.5 t ha⁻¹) and T6 (50% RFD + residual effect of CD 2.5 t ha⁻¹, PM 1.5 t ha⁻¹, and Com. 2.5 t ha⁻¹). The manures viz. cowdung (CD), poultry manure (PD) and compost (Com.) was applied to the previous crop (T. Aman rice). The recommended doses of fertilizers were used to supply N, P, K and S @ 140, 15, 60 and 15 kg ha⁻¹, respectively to the present crop. Residual effects of organic manure with inorganic fertilizers significantly increased the yield attributes as well as grain and straw yields of rice. Treatment T6 (50% RFD + residual effect of CD 2.5 t ha⁻¹, PM 1.5 t ha⁻¹, and Com. 2.5 t ha⁻¹) produced the highest grain yield (6.87 t ha⁻¹) and straw yield (7.24 t ha⁻¹). The lowest grain yield (3.22 t ha⁻¹) and straw yield (4.55 t ha⁻¹) were found in T0 (Control) treatment. Further, it was observed that T2 (75% RFD + CD 5 t ha⁻¹) performed better compared to T3 (75% RFD + PM 3 t ha⁻¹) and T4 (75% RFD + Com 5 t ha⁻¹) in exerting residual effects. The NPKS contents and uptake were markedly influenced by residual effects of manures and fertilizers. Therefore, treatment T6 receiving 50% RFD along with the residual effect of 2.5 t ha⁻¹ cowdung, 1.5 t ha⁻¹ poultry manure and 2.5 t ha⁻¹ compost was found to be the best combination of organic and inorganic fertilizers for obtaining the maximum yield of BRRI dhan29.

Keyword: Cowdung; Poultry manure; Compost; Recommended fertilizer dose; Residual effect; Rice yield; Nutrient uptake; Marginal benefit cost ratio