

Reduction of Chemical Fertilizer in Rice-Rice Cropping Pattern Using Different Vermicompost

Authors : Azizul Haque, Kamrun Nahar

Abstract : Field experiments were conducted to reduce the chemical fertilizers with the integrated use of straight and phospho- vermicompost with chemical fertilizers in T. aman-Boro rice cropping pattern at the BINA farm, Mymensingh during 2019-20. Six treatments were used in the experiment for both the crops. The treatments used for T. aman rice (Binadhan 17) with straight vermicompost were as follows: T1: Native soil fertility, T2: 100% N from Chemical Fertilizer (CF), T3:70%N from CF, T4: 30% N from vermicompost-3 + 70% N from CF and T5:30% N from vermicompost-4 + 70% N from CF and T6: 100% PKS only. The treatments of Boro rice (var. Binadhan -10) with phospho-vermicompost were: T1: Native soil fertility, T2: 100% NPKS from chemical fertilizer (CF), T3:75% NKS from CF (Non IPNS) with 1 t ha-1 Phospho-vermicompost (P-Vermicom), T4: 100% NKS (IPNS) with 2 t ha-1 P-Vermicom, T5: 100% NKS from CF (Non IPNS) with 2 t ha-1 P-Vermicom and T6: 100% NKS. The experiments were conducted in a Randomized Complete Block Design with three replications. The treatment T5 (5.5 t ha-1) gave maximum grain yield of T.aman rice followed by the treatment T4 (5.4 t ha-1). But the treatments T5, T4, and T2 gave identical grain yields of T. aman rice. Similar results were observed in case of straw yields of T. Aman rice. The result indicated that 70% N from CF with 30% N from either straight vermicompost-3 or straight vermicompost-4 gave comparable yield to the sole application of 100% N from CF alone. Therefore, 30% chemical fertilizers (N, P, K and S) could be saved with the integrated (IPNS) use of vermicompost-3 or vermicompost-4 in the cultivation of T. aman rice. Application of Phospho-vermicompost significantly influenced the yield and yield contributing characters of Boro rice (Binadhan-10). The treatment T4 (7.23.0 t ha-1) gave maximum grain yield of Boro rice followed by the treatments T2 and T5. But the treatments T2 and T5 produced statistically similar grain yields. The results from the treatment T4 (100% NKS (IPNS) with 2.0 t ha-1P-Vermicom) indicated that full demand of P could be met up from 2 t ha-1 Phospho-vermicompost with IPNS chemical fertilizers (NKS) which was sufficient for attaining the highest grain yield of Boro rice than that of the treatment T2 (100% NPKS from CF) and the treatment T5 (100% NKS from CF (Non IPNS) + 2 t ha-1 Phospho-vermicompost). The results revealed that 100% P and substantial amount of N (21%), K (44.6%) and S (53.7%) fertilizers could be saved with the integrated use of Phospho-vermicompost in the cultivation of Boro rice. In case of Boro rice partial cost benefit analysis showed that the application of Phospho-vermicompost (@2 tha--1) with IPNS chemical fertilizes (NKS) gave higher return of Tk. 18,213 / - than that of only 100% chemical fertilizer. Therefore, use of Phospho-vermicompost was beneficial for the cultivation of Boro rice in combination with suitable dose of chemical fertilizers.

Keywords : phosphovermicompost, cropping pattern, rice yield, chemical fertilizer

Conference Title : ICSQBP 2022 : International Conference on Soil Quality, Biodiversity and Productivity

Conference Location : Vienna, Austria

Conference Dates : December 29-30, 2022