

Effect of Integrated Nutrient Management (INM) on yield and economics of wheat

SHABIR AHMAD RATHER AND NARINDER LAL SHARMA

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See end of the article for authors' affiliations

Correspondence to :

SHABIR AHMAD RATHER
Department of Agricultural
Chemistry, A.S. (P.G.)
College, Lakhaoti,
BULANDSHAHR (U.P.)
INDIA

ABSTRACT

A field experiment was conducted at Research Farm of A. S (P.G) College, Lakhaoti, Bulandshahar (U.P) during *rabi* season of 2004 – 05 and 2005 – 06 to find out the effect of integrated nutrient management on productivity and economics of wheat (*Triticum aestivum*). Conjunctive use of Vermicompost, Phosphate solubilizing bacteria (PSB) and Zinc in collaboration with 100% recommended fertilizer dose produced significantly higher grain and straw yield of wheat as compared to its counterpart of 50% NPK, whether applied alone or in combination with FYM, PSB, Zn and Vermicompost. The yield attributes like earhead length (cm), number of grains per earhead and 1000-grain weight (grams) increased by increasing fertility levels from 50% to 100%. In economic consideration, it was found that integration of FYM/ Vermicompost, Zn and PSB with 100% recommended NPK gave higher net income per hectare (Rs 32294) and B:C ratio (2.00) as compared to 50% Recommended NPK.

Key words : Wheat, INM, Yield, Economics.

Fertilizer use especially N, P and K is considered as a corner stone in any drive for increasing the wheat yield. But the continuous use of micronutrient free high analysis NPK fertilizers in the intensive cropping system with diminishing use of organic manures has resulted in the depleting of micronutrients from the soil reserve. Integration of organics with inorganics has been found to be quite promising not only in maintaining higher productivity but also in providing greater stability in crop production (Nambiar and Abrol, 1992). Application of organic manures may also help to check the emerging deficiency of nutrients other than N,P and K. Further, it brings economy and efficiency in fertilizers. The INM affects the Physical, Chemical and Biological environment of the soil and thus preserve the soil health. As such the goal of sustainable production could be achieved without any disastrous effect on soil and environment. Considering the above facts, present investigation was carried to find out the effect of integrated nutrient management on productivity and economics of wheat.

MATERIALS AND METHODS

A field experiment was carried during the *rabi* season of 2004 – 05 and 2005 – 06 on the Research Farm of A.S (P.G) College, Lakhaoti, Bulandshahar (U.P). The soil of the experimental field was well drained, sandy loam, slightly alkaline in reaction (pH 8.0) having E.Ce-1.2 dsm⁻¹, organic Carbon -2.8g/kg soil, available N-196.00 kg ha⁻¹, available P-24.0 kg ha⁻¹, available K 285.0 kg ha⁻¹ and DTPA-Zn 1.4 mg k⁻¹. The soil was low in available N and K and medium in available P. Twenty

treatments consisted of two levels of NPK (50% and 100%) alone and in combination with FYM, PSB, Zn and Vermicompost were laid out in Randomized Block Design (R.B.D) with three replications. Nitrogen, Phosphorous, Potassium and Zn were applied in the form of Urea, Single Super Phosphate, Muriate of Potash and Zinc Sulphate (ZnSO₄) @ 120, 60, 40 and 25 kg ha⁻¹, respectively. The whole amount of phosphorous and potassium and half quantity of nitrogen as per treatment was applied at the time of sowing as basal dressing and rest half of nitrogen was applied in two splits as top dressing at the CRI and tillering stages. Vermicompost (5t ha⁻¹) and FYM (10t ha⁻¹) were applied as basal dressing. PSB (Phosphate solubilising bacteria) was applied as seed treatment @ 100ml per 500-600 ml water for 10kg seeds. Wheat variety (PBW – 373) was used as test crop.

RESULTS AND DISCUSSION

Increasing the levels of NPK caused an increment in earhead length (cm), number of grains per earhead and 1000 grain weight (g) (Table 1). These parameters were affected by and large to the same extent when subjected to INM involving FYM + PSB + Zn or Vermicompost + PSB + Zn as compared to control as well as either of the components clubbed with NPK. The highest mean earhead length (16.45cm), number of grains / earhead (61.5) and 1000 – grain weight (48.60 g) were recorded with T₂₀ in which 100% recommended NPK was clubbed with Vermicompost, PSB and Zn and was at par with T₁₇ in which 100% recommended NPK was clubbed with FYM, PSB and Zn. The lowest mean