THE INTEGRATED EFFECT OF MINERAL AND ORGANIC NITROGEN, AND AZOTOBACTERIZATION ON THE YIELD AND NITROGEN NUTRITION OF WHEAT

*Mohammad Idris, Mohsin Iqbal, S. Mahmood Shah and W. Mohammad**

ABSTRACT

The effect of mineral N (40 mg kg^{-1} soil) as commercial urea (46.0% N), organic N (40 mg kg^{-1} soil) as Sesbania aculeate, L (3.0% N) alone and in various combination (3:1; 1:1; 1:3 ratios) with and without Azotobacterization was investigated on the yield and N uptake by wheat cv. Fakhar-e-Sarhad in a pot culture study. The results by and large revealed that application of mineral and organic N with Azotobacterization in various combinations improved ($P \leq 0.05$) the grain, shoot, biomass yield and N uptake by wheat compared to 40 mg mineral N kg^{-1} soil. The effect of combination doses, mineral N at 40 mg kg^{-1} soil + Azotobacterization, mineral N at 30 mg kg^{-1} soil + organic N at 10 mg kg^{-1} soil + Azotobacterization, mineral N at 20 mg kg ha^{-1} soil + organic N at 20 mg ha^{-1} soil + Azotobacterization and mineral N at 10 mg kg^{-1} soil + organic N at 30 mg kg^{-1} soil + Azotobacterization in improving the yield and N uptake by wheat were at par and were better ($P \leq 0.05$) than other treatments. The effect of organic N + Azotobacterization of wheat in improving the grain, shoot and biomass yield of wheat was at par with that of 40 mg mineral N kg^{-1} soil applied alone and was the dose of second significant order. Organic N at 40 mg kg^{-1} soil and Azotobacterization of wheat alone did not improve rather decreased ($P \leq 0.05$) the grain, shoot and biomass yield and N uptake by wheat as compared to mineral N applied at 40 mg kg^{-1} soil alone. The integration of mineral N and organic N in various proportions with Azotobacterization have substantially reduced the mineral N requirement of wheat. The densities of Azotobacter population in the wheat rhizosphere due to Azotobacterization were relatively higher ($4x10^2$ to $3x10^5$ g^{-1} soil) than those observed in the non-rhizospheric soil of wheat ($3x10^2$ to $4x10^3$ g^{-1} soils).