

INTEGRATED NUTRIENT MANAGEMENT FOR SUSTAINABLE WHEAT PRODUCTION UNDER RAINFED CONDITIONS

Aumbrin Tabasam, Safdar Ali and Rifat Hayat*

ABSTRACT

Sustainable agriculture in Pakistan would not only be the management and conservation of the natural resource base, but also helpful in rehabilitating the depleted soil fertility, which can be achieved by tapping and coordinating all resources of plant nutrients judiciously and efficiently. There is no alternative to the use of optimum quantity of plant nutrients for increased production. Organic manures have been used for generations for this purpose. Use of chemical fertilizers is relatively recent. Each source has an important role to play and no single source can substitute the other. Integrated use of all sources needs urgent attention. Field trial was conducted on farmer's field in Futeh jung. The field were divided into three equal parts. During summer, the main treatments were fallow, farmyard manure (FYM) @ 20 t/ha and mungbean as N_2 fixed. In the following winter season, wheat was planted with four combinations of nitrogen (N) and recommended rates of phosphorus (P) as sub treatments on the same field. N_2 fixation in mungbean was assessed by Xylem Solute technique. The effect of integrated nutrient management (INM) on soil nitrate-N was significant. Overall; the interaction of FYM with 80-0 NP kg ha⁻¹ was the most significant in its impact on the soil nitrate-N level. The various treatments did not affect significantly on the total organic carbon (TOC) in the soil. However, TOC contents were higher with the application of Mungbean along with 80-40 NP kg ha⁻¹. The plant height was not significantly effected by any of the treatments. Wheat biomass yield was significantly affected by the sub-treatments. Highest biomass yield was obtained under Mungbean with 80-0 NP kg ha⁻¹ and lowest under Fallow with 0-0 NP kg ha⁻¹. The treatments caused a significant increase in the grain yield of wheat. The effects of FYM and Mungbean were similar whereas, among the sub-treatments 80-40 NP kg ha⁻¹ gave the highest grain yield. There was no significant effect of various treatments on grain N-content. Highest grain N-content was recorded with FYM. Among the sub-treatments 80-0 NP kg ha⁻¹ resulted in the highest N-content. Thus a treatment combination of FYM with 80-0 NP kg ha⁻¹ was the best. Application of FYM caused 8% increase in P-content when compared with that of Fallow. Among the sub-treatments 0-0 NP kg ha⁻¹ gave the highest value, but statistically they were non-significant.