

Research Article

Nutrient management in direct seeded rice and its residual effect on uptake, translocation and recovery of nutrients in rainfed lentil

■ PANKAJ KUMAR PANKAJ, NINTU MANDAL, R.P. SINGH AND NIRMAL DE

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MEMBERS OF RESEARCH FORUM :**Corresponding author :**

NIRMAL DE, Department of Soil Science and Agricultural Chemistry, Institute of Agricultural Sciences, Banaras Hindu University, VARANASI (U.P.) INDIA
Email: nirmalde@gmail.com

Co-authors :

PANKAJ KUMAR PANKAJ, Department of Soil Science and Agricultural Chemistry, Institute of Agricultural Sciences, Banaras Hindu University, VARANASI (U.P.) INDIA

NINTU MANDAL, Bihar Agricultural University, Sabour, BHAGALPUR, (BIHAR) INDIA

R.P. SINGH, Department of Agronomy, Institute of Agricultural Sciences, Banaras Hindu University, VARANASI (U.P.) INDIA

Summary

On farm experimental data was recorded during *Rabi* season of 2008 to 2011 at Banaras Hindu University, Varanasi, India in a long term nutrient management experiment in a rainfed rice based system under All India Coordinated Research Project on Dry land Agriculture. The experiment was laid out with six treatments namely, control (no nutrient supplemented), 100% RDF (80-40-30 kg ha⁻¹ N: P: K), 100% N through FYM, 50% N through FYM, 50% RDF + 50% N through FYM and Farmer's Practice (only 20 kg N ha⁻¹) applied for *Kharif* direct seeded rainfed rice crop in an Inceptisol. The residual effect of these treatments on yield and nutrient uptake efficiency was studied on rainfed *Rabi* lentil crop. The experimental findings indicated that crops grown under 100% N through FYM (T₃) treatment was significantly superior in increasing grain, stubble yield as well as protein yield of lentil. The conjunctive use of organic and inorganic source of fertilizer significantly induced to release higher concentration of N, P, K and S in the soil available pool thereby increased uptake by lentil plant at harvest. A significantly higher yield and economic return (B: C=0.72) was noted when the crop was grown under 100% N through FYM followed by T₅, 50% RDF + 50% N through FYM (B: C=0.62) and T₂, 100% RDF (B: C=0.54). The grain yield of lentil crop was found to be significantly and positively correlated with uptake of N (r=0.91*), P (r=0.93*), K (r=0.89*) and S (r=0.90*) by crop grains. The maximum protein content (23.7 %) and protein yield (119.5 kg ha⁻¹) was recorded in crops grown under organic nutrient sources (100 % N through FYM), significantly higher over all other treatments. The grain yield of lentil was significantly correlated to the translocation of N (r=0.87*), P (r=0.90*), K (r=0.89*) and S (r=0.97*) nutrient in grain. Application of FYM (50% or 100%) in *Kharif* rainfed rice induced significantly higher residual contribution of nutrients N, P, K and S coupled with agronomic efficiency in succeeding *Rabi* lentil crop when compared to equivalent supplementation by peer inorganic fertilizers.

Key words : Rainfed lentil, Nutrient uptake, Nutrient translocation, Agronomic efficiency

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