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Abstract: In order to meet food requirement of the increasing human population, productivity of cereals and pulses has to be enhanced to match the national requirement. Lentil an important pulse crop, its successful farming is possible only with the adopt ion of suitable nutrient management strategies to mitigate the challenging situation of the region. Integrated nutrient management technology with balanced and efficient application of inorganic fertilizer, organic manure and bio-fertilizer is essential for obtaining higher yield and reducing cost of cultivation. It also integrates the objectives of production, ecology, environmental and an important part of any sustainable agricultural production system. Hence, a field experiment to study the effect of integrated nutrient management on productivity of lentil was conducted on slightly acidic (pH 5.7) sandyloam soil (31.6% silt and 14% clay) having low organic carbon (3.7 g/kg), available nitrogen (263.42 kg/ha), phosphorous (12.18 kg/ha), and sulphur (7.70 kg/ha) and medium in exchangeable potassium (155.64 kg/ha) at the University farm during winter season of 2009-10. Altogether 14 treatments, comprising control (no nutrient), recommended dose of fertilizer, RDF (20,40,20 and 20 kg NPKS/ha), 50 %RDF, farmyard manure(5 t/ha), vermicompost (2 t/ha), bio-fertilizer (rhizobium + PSB), combinations of FYM/vermicompost/bio-fertilizer each with RDF and 50 % RDF, combinations of bio-fertilizer with FYM and vermicompost were laid out in randomized block design with three replications. Results revealed that integration of recommended dose of fertilizer (20 kg N, 40 kg P₂O₅, 20 kg K₂O and 20 kg S/ha) with farmyard manure (5t/ha) produced higher dry matter (589 g/m²), taller plant (34.6 cm), pods/ plant (39.6) resulting in higher grain (18.56 q/ha) and biomass (47.78 q/ha) production, grain (43.93 kg/day/ha) and biomass (42.16 kg/day/ha) productivity, protein yield (354.99 kg/ha), gross energy output by grain (24018 MJ/ha) and biomass (58161 MJ/ha), net energy output by grain (16462 MJ/ha) and biomass (50605 MJ/ha), net return (Rs. 51049/ha) and benefit : cost ratio (4.27) than other nutrient management practices. The earlier treatment removing higher nitrogen (80.85 kg/ha), phosphorous (7.31 kg/ha), potassium (37.36 kg/ha) and sulphur (14.43 kg/ha) also maintained higher soil available nitrogen (296.87 kg/ha), phosphorus (30.24 kg/ha) and exchangeable potassium (207.74 kg/ha) after crop harvest than any other nutrient management practices. On the basis of one year experimentation, it may be concluded that application of recommended dose of fertilizer (20, 40, 20 and 20 kg NPKS/ha) along with farmyard manure (5 t/ha) is not only productive and remunerative but also maintains higher soil fertility.

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