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RESPONSE OF LENTIL TO DIFFERENT FERTILIZER LEVELS UNDER RAINFED CONDITIONS

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ABSTRACT

Response of lentil (Var. Mansehra-89) to six fertilizer levels viz. 0-0, 0-30, 0-45, 15-30, 15-45 and 15-60 kg N P_2O_5 ha^{-1} was studied under field conditions during 1990-91 and 1991-92.The experiment was carried out on sandy clay loam soil low in organic matter and available phosphorus. All the fertilizers were applied at sowing time. Various fertilizer levels significantly affected 1000-seed weight,seed and straw yields. Application of fertilizer @ 15-60 kg N P_2O_5 ha^{-1} proved to be the best which not only produced the highest seed (1114 kg ha^{-1}) and straw (3.7 t ha^{-1}) yields but also gave heaviest 1000-seed weight (37.9 g). Nitrogen and P content and uptake in seed and straw also increased with fertilizer application. Significantly highest N-uptake in seed (26.892 kg ha^{-1}) and straw (16.354 kg ha^{-1}) was noted by the application of fertilizer level 15 + 60 kg N P_2O_5 ha^{-1}. The highest P-uptake in seed (5.982 kg ha^{-1}) and straw (2.479 kg ha^{-1}) was also noted with the same fertilizer level.The most economical fertilizer level was 15 + 30 kg N P_2O_5 ha^{-1}.

INTRODUCTION

Lentil *(Lens Culinaris Medik)* is one of the most important high protein (20-24 %) pulse crop of the Punjab (Malik *et al.* 1991). The production of lentil per unit atea is very low, mainly due to non-availability of widely adopted high yielding varieties, adoption of traditional farming practices, [illegible] of marginal land and minimal inputs etc. [illegible]rious production factors, use of fertilizer is [illegible]jor factors affecting seed yield per [illegible] [illegible]of rainfed region are generally

ha^{-1} without P to 1.39 t ha^{-1} with 60 kg P ha^{-1}. Singh *et al.* (1991) reported the lowest seed yield of lentil (2.93 t ha^{-1}) without fertilizer and highest (6.59 t ha^{-1}) with 10 kg N ha^{-1} + 40 kg P_2O_5 ha^{-1}. They further noted the higher yield with P alone than N alone and application of K with N + P did not significantly increase the yield. Rai and Singh (1991) applied 20 to 80 kg P_2O_5 ha^{-1} to lentil cultivars and observed that seed yield increased with upto 60 kg P_2O_5 ha^{-1}. Rathore *et al.* (1992) reported that application of P_2O_5 upto 40 kg ha^{-1} increased protein content and N-uptake by lentil grain while P-uptake increased upto 60 kg P_2O_5 ha^{-1}. They further noted that P-uptake by straw and total uptake (grain + straw) showed a rising trend with upto 40 kg P_2O_5 ha^{-1}. Singh*et al.* (1992) reported that 0, 20 and 40 kg N ha^{-1} produced lentil seed yields of 0.85, 0.98 and 1.07 t ha,$^{-1}$ respectively while application of 0, 13, 26 and 39 kg P ha^{-1} produced lentil seed yields of 0.67, 0.97, 1.11 and 1.13 t ha,$^{-1}$ respectively. Singh and Singh (1992) applied 0, 20, 40 and 60 kg P_2O_5 ha^{-1} to lentil and noted that seed yield, P-uptake and P content in seeds and straw increased with upto 40 kg P_2O_5 ha^{-1}. Kumar and Agarwal (1993) applied 0 or 20 kg N ha^{-1} and 25 to 100 kg P_2O_5 ha^{-1} to lentil cultivar with or without rhizobium inoculation. They observed the seed yields of 1.88 to 1.92 t ha^{-1} with 0 and 20 kg N ha $^{-1}$, respectively and further noted that yield increased with upto 50 kg P_2O_5 ha^{-1}. Kumar *et al. (1993) applied 0 or 20 kg N* ha^{-1} and 25, 50, 75 or 100 kg P_2O_5 ha^{-1} to lentils with or without rhizobium inoculation. They noted that 20 kg N ha^{-1} and 50 kg P_2O_5 ha^{-1} significantly