

Yield and nutrient uptake by fenugreek (*Trigonella foenum-graecum*) as influenced by nitrogen, phosphorus and potash

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An experiment was conducted during the winter season of 1991–92 at Instructional Farm, Janagadh, to work out nitrogen, phosphorus and potassium requirement of fenugreek (*Trigonella foenum-graecum* L.). Eighteen treatment combinations comprising 3 levels each of N (0, 30 and 60 kg/ha) and P (0, 60 and 120 kg/ha) and 2 levels of K (0 and 30 kg/ha) were tried in a factorial

randomized block design with 3 replications. The soil was clayey in texture having pH 7.8, organic carbon 0.6%, total N 0.06%, available P_2O_5 28.1 kg/ha and K_2O 126.4 kg/ha. Half the dose of N and full dose of P and K were applied basal in the form of urea, single superphosphate and muriate of potash respectively. The remaining N was top-dressed 45 days after sowing.

Table 1. Influence of NPK fertilization on seed and straw yields and nutrient uptake by fenugreek crop

Treatment	Yield (kg/ha)		Nutrient uptake (kg/ha)					
	Seed	Straw	N		P_2O_5		K_2O	
			Seed	Straw	Seed	Straw	Seed	Straw
<i>N (kg/ha)</i>								
0	1,229	2,335	23.25	12.93	3.38	2.56	12.73	8.45
30	1,610	2,060	35.45	18.75	7.71	5.06	12.57	11.72
60	1,427	2,712	31.23	16.85	5.75	3.79	15.22	10.15
CD (P = 0.05)	57.14	103.81	1.38	1.38	0.68	0.68	0.69	0.69
<i>Phosphorus (kg/ha)</i>								
0	1,300	2,472	25.78	13.98	3.84	2.53	12.78	8.52
60	1,538	2,922	34.17	18.36	7.74	5.10	17.50	11.67
120	1,428	2,713	29.98	16.18	5.75	3.78	15.23	10.17
CD (P = 0.05)	57.14	103.81	1.38	1.38	0.68	0.68	0.69	0.69
<i>Potassium (kg/ha)</i>								
0	1,385	2,632	28.92	15.63	5.20	3.42	14.47	9.66
30	1,549	2,772	31.03	16.72	6.36	4.19	15.88	10.58
CD (P = 0.05)	46.67	84.76	1.13	NS	0.55	0.55	0.57	0.57

Seed and straw yields of fenugreek responded to N, P and K application significantly (Table 1). The significantly higher seed and straw yields were recorded only up to 30 kg N/ha, and further increase was not found progressive. Thus favourable influence of N on growth parameters and yield attributes as well as on increased seed and straw yields was found under this level. Increase in P_2O_5 up to 60 kg/ha significantly increased seed and straw yields compared with rest of the P levels. Increase in seed yield due to 60 and 120 kg P_2O_5 /ha was 18.3 and 9.9% respectively over the control. Increased straw yield might be due to higher synthesis of carbohydrates and protein. Application of K @ 30 kg/ha recorded higher seed and straw yields over the control. Thus favourable influence of K on growth and yield attributes contributed towards the higher seed and straw yields under this level.

Significantly higher removal of N, P and K by seed and straw was observed under 30 kg N/ha. It was due to cumulative effect of higher content of these nutrients in seed and straw as well as higher biological yield under this level. Besides this, N fertilization might increased the cation-exchange capacity of the plant roots and thus makes them

efficient in absorbing nutrient ions. The findings confirm the reports of Rathore and Manohar (1989). Fertilizing the crop with 60 kg P_2O_5 /ha recorded significantly higher removal of N, P and K by seed and straw. It might due to greater availability of P and improved root-system which resulted in greater accumulation of these nutrients in tissues and higher biological yields. The results confirm the findings of Maliwal and Gupta (1988). The application of K significantly increased the uptake of N, P and K by seed and P and K by straw. This may be due to the balanced utilization of N, P and K resulted in higher content of these nutrients in seed and straw as well as higher biological yield under this level. The finding supports the results of Patel *et al.* (1991).

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