

Response of fenugreek (*Trigonella foenum-graecum*) to nitrogen, phosphorus and potassium

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A field experiment was laid out at Instructional Farm, Junagadh, during the winter season (*rabi*) of 1991–92. The soil was clayey in texture (21.3% sand, 25.4% silt and 53.4% clay) and slightly alkaline in reaction (pH 7.8). It was deficient in available nitrogen (229 kg/ha) and potassium (124 kg/ha) and medium in phosphorus (29.0 kg/ha). Eighteen treatment combinations of 3 levels each of N (0, 30 and 60 kg/ha) and

P₂O₅ (0, 60 and 120 kg/ha) and 2 levels of K₂O (0 and 30 kg/ha) were tried in factorial randomized block design with 4 replications. Fenugreek cv. 'IC 9955' was sown on 18 November with 30 cm inter-row spacing and using a seed rate of 25 kg/ha. Entire quantity of P and K and half quantity of N fertilizer was applied at sowing as per treatments. Remaining quantity of N was top-dressed at 30 days after sowing.

Table 1. Effect of nitrogen, phosphorus and potash on growth parameters, yield attributes and yield of fenugreek

Treatment	Growth parameter			Yield attribute			Yield (kg/ha)	
	Plant height (cm)	Plant spread (cm)	Primary branches/plant	Pods/plant	No. of seeds/pod	1,000-seed weight (g)	Seed	Straw
<i>N (kg/ha)</i>								
0	43.70	7.47	6.68	13.44	12.12	11.38	1,229	2,335
30	53.57	13.45	8.58	17.45	16.15	14.32	1,610	3,060
60	47.35	10.55	7.48	15.48	14.37	12.61	1,427	2,712
CD (P = 0.05)	3.47	0.74	0.45	0.78	0.27	0.22	57.14	103.81
<i>P₂O₅ (kg/ha)</i>								
0	44.02	9.28	6.48	14.51	13.38	12.42	1,300	2,472
60	52.43	11.70	8.58	16.43	14.76	13.15	1,538	2,922
120	47.97	10.48	7.68	15.43	14.60	12.73	1,728	2,713
CD (P = 0.05)	3.47	0.74	0.45	0.78	0.27	0.22	57.14	103.81
<i>K₂O (kg/ha)</i>								
0	46.84	10.43	7.48	15.06	14.13	12.64	1,385	2,632
30	49.43	10.54	7.69	15.86	14.37	12.90	1,549	2,772
CD (P = 0.05)	NS	NS	NS	0.63	0.22	0.18	46.67	84.76

NS, Non Significant

A significant increase in all growth characters, yield attributes as well as seed and straw yields was noticed up to the application of 30 kg N/ha. Further increase in N level was not found beneficial. Nitrogen application at this level stimulated the cell-division, elongation and ultimately promoted the vegetative growth and yield-attributing characters and consequently resulted in higher seed and straw yields of fenugreek. Similar results were reported by Pareek and Gupta (1981).

Crop fertilized with 60 kg P_2O_5 /ha was found significantly superior to rest of the levels in respect of all the growth parameters, yield attributes as well as seed and straw yields. A consistent increase in growth and yield attributes with increase in the levels of P_2O_5 up to 60 kg/ha might be responsible for higher yield due to promotion in extensive root development and nodulation and thereby ensuring a good yield. But higher and lower levels of phosphorus than 60 kg P_2O_5 /ha did not favour to obtain potential yield of fenugreek. The magnitude of increase in seed and straw yields under 60 kg P_2O_5 /ha was 18.3 and

18.2 % over the control respectively. The findings confirm the reports of Patel *et al.* (1991).

Application of potassium did not exert its significant effect on growth parameters, but yield-attributing characters and yields were significantly improved by the application of 30 kg K_2O /ha over the control (Table 1). Application of 30 kg K_2O /ha recorded 11.8% higher seed yield over the control. This might be due to increase in photosynthetic activities and maintenance of the proper water balance in plants. Similar results were also obtained by Jain *et al.* (1987).

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