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Nutritional requirement of taramira (*Eruca sativa*)

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ABSTRACT

A field study was conducted during the winter season of 1995–96, 1996–97 and 1997–98 to study the nutritional requirement of taramira (*Eruca sativa* Mill.). A linear increase in growth and yield attributes was recorded with an increase in level of nitrogen up to 80 kg/ha and phosphorus up to 45 kg/ha. The significant increase in grain yield over the control was 61.27% with the application of 60 kg N + 30 kg P_2O_5/ha.

Key words : Taramira, N, P_2O_5, N × P

A vast area in mid-western plain zone comes under rainfed condition and for this area the crop like taramira is most suitable for cultivation in the winter (*rabi*) season to enhance the oilseed production (AICRP-RM, 2000). Taramira has very low productivity, mainly due to lack of knowledge of improved variety and non-use of fertilizer. Since little information is available on taramira for this agro-climatic zone, the present investigation was undertaken.

MATERIALS AND METHODS

A field experiment was conducted during the winter season of 1995–96, 1996–97 and 1997–98 with taramira ('T 27') at Research Station, Ujhani, Badaun, Uttar Pradesh. The Entisol (Typic Ustipsamments) of the experimental site was well-drained loamy sand, having pH (1:2.5), 7.4 to 7.6, EC 0.06 to 0.09 mmhos/cm, organic carbon 0.18 to 0.22%, available P_2O_5 13.88 to 14.78 and available K_2O 129.92 to 138.88 kg/ha. The experiment was carried out in factorial randomized block design with 3 replications. The treatments consisted 5 levels of nitrogen (0, 20, 40, 60 and 80 kg/ha) and 3 of phosphorus (0, 30 and 45 kg/ha) through urea and single superphosphate respectively. A uniform dose of K_2O @ 30 kg/ha was applied basal through muriate of potash in all treatments. Gypsum was applied to make sulphur application uniform in all treatments. The crop was sown in rows 30 cm apart and plant-to-plant spacing of 10 cm was maintained by thining 20 days after sowing. The crop was sown in second fortnight of October and harvested during the second fortnight of March every year.

RESULTS AND DISCUSSION

Growth attributes

Fertilizers application had significant effect on growth attributes of taramira. Application of N increased the plant height, primary branches/plant and secondary branches/plant with an increase in its dose up to 80 kg/ha. The pooled data showed that 80 kg N/ha significantly increased the primary and secondary branches/plant. Plant height was increased significantly up to 40 kg/ha level (Table 1).

Significantly higher plant height and primary branches/ plant were recorded at 45 kg P_2O_5 /ha. However, significant increase in secondary branches/plant was observed up to 30 kg P_2O_5 /ha (Table 1).

Yield attributes and seed yield

The yield attributes, siliquae/plant, length of siliqua, seeds/siliqua, 1,000-seed weight and seed yield, increased with increasing levels of N and reached at maximum 80 kg N/ha. The effect was significant only up to 60 kg N/ha in siliquae/plant, length of siliqua and 1,000-seed weight and 40 kg N/ha in seeds/siliqua (Table 1). Seed yield increased significantly up to 60 kg N/ha, being 37.67% higher over the control. Nitrogen fertilization increases photosynthetic activity and translocation of photosynthates which might have promoted the growth and yield attributes of the crop and ultimately higher yield. Similar findings were also reported by Jat *et al.* (1987) and Maliwal and Mundra (1989).

A linear increase in yield attributes and seed yield was recorded with an increase in level of P up to 45 kg/ha. The siliquae/ plant, 1,000-seed weight and seed yield significantly increased up to 45 kg P_2O_5 /ha and length of siliqua and seeds/siliqua up to 30 kg P_2O_5 /ha level only (Table 1). Increase growth and yield attributes owing to phosphorus application could be ascribed to the low level of available phosphorus in experimental soil and to the overall improvement in plant growth,

Table 1. Effect of levels of nitrogen and phosphorus on growth and yield attributes of taramira (pooled data of 3 years)

Treatment	Plant height (cm)	Primary branches/ plant	Secondary branches/ plant	Siliquae/ plant	Length of siliqua (cm)	Seeds/ siliqua	1,000- seed weight (g)	Seed yield (kg/ha)
Nitrogen (kg/ha)								
0	105.7	8.3	19.1	213.8	1.92	16.8	3.159	1,085.65
20	111.4	9.1	21.1	251.2	2.10	18.0	3.236	1,243.25
40	117.9	9.4	21.3	262.9	2.25	18.6	3.261	1,374.04
60	115.3	10.1	22.3	273.9	2.29	18.9	3.281	1,494.60
80	115.7	10.6	23.8	279.1	2.31	19.1	3.281	1,528.74
CD (P=0.05)	0.81	0.25	0.62	5.98	0.04	0.36	0.014	37.92
Phosphorus (kg/ha)								
0	110.6	9.1	20.7	242.3	2.13	17.9	3.188	1,250.58
30	113.1	9.5	21.8	259.9	2.19	18.3	3.262	1,362.62
45	114.2	9.8	22.1	266.3	2.20	18.5	3.281	1,422.57
CD (P=0.05)	0.63	0.19	0.48	4.63	0.03	0.28	0.011	29.37

Table 2. Effect of nitrogen and phosphorus on seed yield (kg/ha) and siliquae/plant of taramira (pooled data of 3 years)

Nitrogen (kg/ha)	Siliquae/plant at P (kg/ha)			Seed yield (kg/ha) at P (kg/ha)		
	0	30	45	0	30	45
0	184.0	224.8	232.6	936.92	1,103.59	1,216.44
20	241.0	251.4	261.2	1,155.09	1,245.37	1,329.28
40	252.2	262.7	273.9	1,291.09	1,403.36	1,427.66
60	264.4	277.4	279.8	1,423.61	1,511.00	1,549.19
80	270.0	283.4	283.9	1,446.18	1,549.77	1,590.28
CD (P=0.05)	10.35			65.68		

vigour and production of sufficient photosynthates. These results corroborate the work of Khafi *et al.* (1997) to Indian mustard and Singh and Verma (1999) in linseed.

Interaction

The interaction effect between N and P was significant on siliquae/plant and seed yield in pooled analysis. The interaction effect revealed that maximum siliquae/plant were recorded when N and P were applied at their highest level, i.e. 80 kg N and 45 kg P_2O_5. The siliquae/plant increased significantly up to 60 kg N and 30 kg P_2O_5 and values at higher levels were not significant (Table 2). A significant and linear increase in seed yield of taramira from no N and P application to 60 kg N and 30 kg P_2O_5/ha was recorded. The increase in seed yield at 60 kg N and 30 kg P_2O_5 (1,511.00 kg/ha) over the control was 61.27%. A further increase in N and P level (80 kg N and 45 kg P_2O_5) did not improve the seed yield significantly (Table 2). Application of 60 kg N and 30 kg P_2O_5/ha significantly increased the siliquae/plant and seed yield owing to enhanced growth attributes that diverted the photosynthates to reproductive organs for the formation of large-sized and more number of seeds of higher seed weight that ultimately increased the yield/ha. Singh *et al.* (1998) reported that each successive increment of N and P levels up to 80 kg N and 40 kg P_2O_5 significantly increased the sunflower seed yield.

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