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Growth and yield of taramira (*Eruca sativa*) as affected by nitrogen and sulphur under dryland conditions

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ABSTRACT

A 2-year field experiment was conducted during 1997–99 at New Delhi, to study the effect of 4 levels of nitrogen (0, 20, 40 and 60 kg N/ha) and 3 levels of sulphur (0,20 and 40 kg S/ha) on the growth and yield of rocket-salad or taramira *(Eruca sativa* Mill.) under dryland conditions. An application of 60 kg N/ha resulted in the highest seed yield (22.12 q/ha), being significantly higher than that of lower levels of N. Each higher level of nitrogen appreciably improved the growth and yield characters (plant height, primary branches/plant, siliquae/plant and seed yield/plant). The seed yield and yield attributes also increased significantly with 40 kg S/ha compared with the control.

Key words : Taramira, Nitrogen, Sulphur, Dryland, Seed yield.

Taramira or rocket salad is specially suitable for dryland areas because of efficient root-system to extract moisture from lower soil horizons (Singh and Sharma, 1976). Of the major elements, nitrogen (N) is found insufficient in most of the Indian soils. Jat *et al.* (1987) reported beneficial effect of N in increasing the growth parameters and seed yield of taramira. During the past few years, sulphur (S) has received increasing attention. Global reports of S deficiency and consequent crop responses are quite ostensible (Tandon, 1989). Systematic work on the fertilizer requirement of taramira is meagre and needs immediate attention to raise the production in drylands. Since the information available on taramira regarding N and S fertilization under drylands is limited, the present investigation was undertaken to study the effect of N and S levels on the growth and yield of taramira.

MATERIALS AND METHODS

A field experiment was conducted during the winter (*rabi*) season of 1997–98 and 1998–99 at the Indian Agricultural Research Institute, New Delhi. The soil was sandy loam with pH 7.4, analysing low in organic carbon (0.4%) and available S (7.2 ppm), medium in available P (14.0 kg/ha) and available K (221 kg/ha). The treatments comprising 4 nitrogen levels (0, 20, 40 and 60 kg/ha) and 3 sulphur levels (0,20 and 40

kg S/ha) were replicated 4 times in randomized block design. As per treatment full dose of N as urea and S as gypsum along with 20 kg P_2O_5/ha were applied before sowing by drilling in furrow. The experiment was sown after fallow on conserved soil moisture. 'RTM 2' taramira was sown in rows 30 cm apart, on 28 and 31 October, and harvested on 29 March and 2 April during 1997–98 and 1998–99 respectively. Crop received well-distributed rainfall of 241.8 and 236.4 mm in the respective season.

RESULTS AND DISCUSSION

Nitrogen

Nitrogen fertilization significantly increased the plant height, primary branches/plant, siliquae/plant, 1,000-seed weight and seed yield/plant at harvest. Primary branches/plant and 1,000-seed weight significantly increased up to 40 kg N/ha, whereas plant height, siliquae/plant and seed yield/plant increased up to 60 kg N/ha. This may be attributed to better availability of N at active growth of crop, and the role of N in chlorophyll, protein and protoplast formation. Jat *et al.*, also reported similar effects of N in increasing the plant height, primary branches and siliquae/plant. Favourable effect of N on growth and yield attributes were reflected on seed yield. Pooled data indicated (Table 1) that successive increase in N levels caused significant increase in seed yield, being 7.34, 17.28 and 28.0% with 20, 40 and 60 kg N/ha over the control respectively.

Sulphur

Sulphur @ 20 kg/ha significantly increased all the growth and yield parameters compared with the control. Further increase in S level to 40 kg S/ha significantly increased plant height, 1,000-

Table 1. Growth and yield attributes and seed yield of taramira as influenced by nitrogen and sulphur (mean data of 2 years)

Treatment	Plant stand/m	Plant height (cm)	Primary branches/ plant	Siliquae/ plant	1,000-seed weight (g)	Seed yield/ plant (g)	Seed yield (q/ha)
N (kg/ha)							
0	7.36	70.1	5.44	95.6	3.40	4.07	17.28
20	7.57	75.0	6.62	121.0	3.46	5.14	18.55
40	7.64	97.3	7.79	130.0	3.53	6.22	20.37
60	7.67	98.1	7.82	141.0	3.53	6.44	22.12
CD (P = 0.05)	NS	0.6	0.26	18.5	0.05	0.11	2.99
S (kg/ha)							
0	7.40	74.0	6.58	114.2	3.44	5.35	18.21
20	7.44	93.7	6.99	124.8	3.48	5.46	19.68
40	7.47	94.0	7.15	126.0	3.52	5.62	21.60
CD (P = 0.05)	NS	0.3	0.18	9.0	0.03	0.9	2.59

seed weight and seed yield/plant only over 20 kg S/ha. The grain yield increased significantly at 40 kg S/ha compared with the control. The differences between 0 and 20 and 20 and 40 kg S/ha were, however, not marked. The increase in growth and yield parameters and finally seed yield by S application could be ascribed to the role of S as constituent of protein, coenzyme A, glutathion, vitamins and oils, synthesis of protein and oil, energy transfer similar to P and activation of enzyme. The increase in seed yield with 40 kg S/ha was 8.0 and 15.5% over 20 kg S/ha and the control respectively (Table 1). The findings confirm the results of Singh (1983).

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