

Short Communication

Effect of Nitrogen and Sulphur on Growth and Yield of Fennel (*Foeniculum vulgare* Mill.)

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Fennel (*Foeniculum vulgare* Mill) is an important cash crop that is extensively cultivated during winter season under irrigation on loamy sand to sandy loam area. However, its average yield (5.6 q ha⁻¹) (Anonymous 1994) is very low and thus offers a great scope for increasing its productivity. Wagner (1993) reported

Table 1. Effect of nitrogen and sulphur on plant height and yield attributes of fennel

Treatment	Plant height (cm)	Branches per plant	Umbels per plant	Umbellets per umbel	Grains per umbellet	Test weight (g)
Nitrogen (kg ha⁻¹)						
0	83.5	5.35	21.1	10.9	10.7	5.32
35	94.0	6.16	24.3	11.1	11.5	5.87
70	101.2	6.80	27.1	11.4	12.0	6.40
105	102.8	6.90	29.9	11.4	12.1	6.65
CD (P = 0.05)	6.71	0.39	1.80	NS	0.50	0.48
Sulphur (kg ha⁻¹)						
0	92.3	5.57	21.7	11.0	11.4	5.58
20	94.9	6.06	24.4	11.2	11.6	6.05
40	96.5	6.58	26.9	11.3	11.7	6.24
60	97.5	7.03	29.05	11.4	11.8	6.37
CD (P = 0.05)	NS	0.39	1.90	NS	NS	0.48

soils of Rajasthan. It has great potential among the traditional crops grown in the

beneficial effects of N in increasing the seed yield of fennel. To improve fennel yield sulphur has received increasing attention during past few years. Global reports of sulphur deficiency and consequent crop responses are quite alarming (Tandon,

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Table 2. Interaction effects of nitrogen and sulphur on grain yield and net returns from fennel

Sulphur (kg ha ⁻¹)	Nitrogen (kg ha ⁻¹)				Mean
	0	35	70	105	
Grain yield (q ha⁻¹)					
0	7.22	8.32	11.55	12.20	9.82
20	8.67	10.95	13.44	14.66	11.93
40	9.40	13.27	15.43	16.14	13.56
60	9.92	15.60	17.22	17.37	15.03
Mean	8.80	12.04	14.41	15.09	
CD (P = 0.05) for N = 0.81					
CD (P = 0.05) for S = 0.81					
CD (P = 0.05) for N x S = 1.61					
Net return (Rs. ha⁻¹)					
0	13918	16898	26332	28016	21291
20	18189	24679	31893	35277	27510
40	20292	31582	37796	39650	32330
60	21795	38575	43099	43293	36676
Mean	18549	27919	34780	36559	
CD (P = 0.05) for N = 2362					
CD (P = 0.05) for S = 2362					
CD (P = 0.05) for N x S = 4724					

1986). Since very little information is available on the effects of N and S on growth parameters and seed yield of fennel, an experiment was carried out on these aspects.

A field experiment was conducted during the winter (rabi) season of 1995-96 at SKN College of Agriculture, Jobner. Treatments comprising 4 levels of nitrogen (0, 35, 70 and 105 kg ha⁻¹) and 4 levels of sulphur (0, 20, 40 and 60 kg ha⁻¹) were tried in factorial randomized block design with three replications. A uniform basal dose of 40 kg P₂O₅ ha⁻¹ was applied to all the plots. The soil was loamy sand with pH 8.2, having N 126.5 kg, available P₂O₅ 12.4 kg and available K 145.0 kg ha⁻¹. The

variety 'UF 101' was sown on November 8, 1995 in rows 45 cm apart with a distance of 20 cm between the plants. One-third of N and whole of P₂O₅ and S were applied as basal dose and the remaining one-third N each was top dressed 45 and 90 days after sowing as per treatment. The crop received 12 uniform irrigations and was harvested on April 21, 1996.

Plant height, number of branches/plant, umbels/plant, grains/umbellet, test weight, grain and straw yield and net returns increased significantly upto 70 kg N level, beyond which the differences were not significant except umbels/plant. Umbels/plant increased significantly upto 105 kg N ha⁻¹. The increase in grain yield was

19.7 and 63.7% higher at 70 kg N ha⁻¹ level compared to that at 35 kg N and without N application (Table 2). The higher yield of fennel with application of N could be due to better supply of N. Consequently plant growth and increased yield attributes contributed to the higher seed yield with increasing dose of N.

Sulphur application significantly increased the number of branches/plant, umbels/plant, and test weight. Grain and straw yields increased significantly with increasing S levels upto 60 kg ha⁻¹. The increase in grain yield was 10.8, 26.0 and 53% higher at 60 kg S ha⁻¹ as compared to that at 40 kg, 20 kg and without S application, respectively. The increase in plant height and number of branches/plant might be attributed to better nutritional environment for plant growth. The increase in the growth parameters as a result of S application might have resulted in increased seed yield of fennel.

Interaction effect of N and S was significant on grain yield and net returns (Table 2). Maximum grain yield and net returns were recorded with 105 kg N and 60 kg S ha⁻¹. Grain yield and net returns obtained with this treatment combination were significantly higher than that obtained with other treatment combinations, except the combination of 70 kg N plus 60 kg S ha⁻¹ and 105 kg N plus 40 kg S ha⁻¹.

Thus, it may be concluded that combined application of 70 kg N and 60 kg S ha⁻¹ significantly increased grain yield and net return from fennel.

References

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