

Response of Sulphur to Some *Kharif* Crops Grown in Coarse Textured Soils of Haryana

S P Gupta, V K Gupta and Ram Kala

Department of Soil Science, Haryana Agricultural University, Hisar — 125 004 India

Crop species vary markedly in their magnitude of responses to S application. A soil having high S status may meet the requirement of one crop while the same soil may fail to support the other crop. Gupta *et al.* (1989) reported mustard to be more responsive crop to S application than wheat crop. Even pulses differ in their response to S application (Ali 1991). In view of the limited information, the present investigation was undertaken to study the magnitude of response of some *Kharif* crops to S application.

A screen house experiment was conducted to evaluate the response of S to five *kharif* crops viz. pigeon pea, green gram, cluster bean, pearl millet and groundnut, grown in 25 cm earthen pot containing 4kg soil (pH 8.0, EC 0.15 dSm⁻¹, O.C., 0.22%, DTPA extractable Zn 0.4 mg kg⁻¹ soil and available S 7.5 mg kg⁻¹ soil). Sulphur was added @ 0, 20 and 40 mg S kg⁻¹ soil through calcium sulphate. A basal dose of N, P, K and Zn was applied @ 25, 50, 62.5 and 5 mg kg⁻¹ soil each in each treatment through urea, potassium dihydrogen phosphate

Table 1 Effect of S on yield and S concentration of *kharif* crops.

Crop	S rates (mg kg ⁻¹ soil)			Mean	Per cent response at 20 mg S kg ⁻¹ soil
	0	20	40		
Dry matter yield (g pot⁻¹)					
Pigeon pea	3.75	5.45	5.08	4.76	45
Green gram	5.40	6.90	6.85	6.38	28
Cluster bean	5.38	6.98	7.58	6.64	30
Pearl millet	16.13	23.25	24.40	21.26	44
Groundnut	18.00	25.63	25.33	22.99	42
Mean	9.37	13.64	13.84	—	—
S concentration (%)					
Pigeon pea	0.30	0.34	0.45	0.36	
Green gram	0.31	0.43	0.54	0.43	
Cluster bean	0.28	0.45	0.59	0.44	
Pearl millet	0.19	0.22	0.27	0.23	
Groundnut	0.25	0.32	0.43	0.33	
Mean	0.27	0.35	0.46	—	
Yields S concentration					
CD (P = 0.05)					
S level mean		0.73		0.02	
Crop mean		0.94		0.03	
Crop x S level		1.63		0.05	

and $ZnCl_2$ at the time of sowing in solution form. Pots were irrigated with deionized water. Each treatment was replicated thrice in a completely randomised design. The crops were harvested at pre-flowering stage and the dry matter yields were recorded. The per cent response was calculated as follows :

$$\frac{\text{Yield at } 20 \text{ mg S kg}^{-1} - \text{Yield of control}}{\text{Yield of control}} \times 100$$

The physico-chemical properties were determined according to standard procedures. Zinc was determined according to Lindsay and Norvell (1978). Available S was extracted with 0.15% $CaCl_2$ (Williams & Steinbergs 1959) solution.

Data (Table 1) revealed that S application markedly increased the dry matter yield irrespective of crops. Application of 40 mg S kg^{-1} soil was not found superior over 20 mg S kg^{-1} soil. Response of 20 mg S kg^{-1} soil to crops ranged from 28 to 45% and was the highest in pigeon pea crop followed by pearl millet and groundnut. This indicated that pigeon pea was more responsive to S as compared to cluster bean and green gram. Ali (1991) also reported that pigeon pea is more responsive to S application than green gram. Pearl millet and groundnut could be rated as equally responsive, which is attributed to high yield potential of pearl millet and lower S requirement, whereas oilseeds have lower yield potential but higher S require-

ment. The response of S to crops depends on the nature of the crop and its yield potential (Tandon 1991). The order of response was : pigeon pea/pearl millet/groundnut/clusterbean/green gram.

Application of S significantly increased the S concentration in all the crops (Table 1). Sulphur concentration also varied with the crop. The highest mean concentration was found in cluster bean and green gram crops, which were less responsive to S application as compared to other crops. This may be due to differential S absorption capacity of different crops.

References

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