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Short Communication

Effect of Sources and Levels of Sulphur on Grain and Stover Yield of Mustard

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Rapeseed and mustard are the major oil seed crops of India (Anonymous, 1992). Rajasthan stands first, both in area (2.22 m ha) and production (1.71 m t) of these crops. Global reports of sulphur deficiency and consequent crop response, particularly in oil seed crops, are quite ostensible. A number of sources supplying sulphur are available in the market. Elemental sulphur is direct source but is too costly. Gypsum and pyrites are being abundantly excavated in the state of Rajasthan, and may be relatively inexpensive as well as more effective. Response of mustard to major plant nutrients is well documented but information regarding influence of S on mustard in light soils is not adequate. The present study relates to the influence of sources and levels of sulphur on grain and stover yield of mustard.

Field experiment was conducted during *rabi* season of 1992-93 with mustard (T-59) as a test crop using different sources of S on loamy sand soil (pH 8.2, EC_e 1.1 dS m^{-1}, CEC 5.9 meq per 100 g soil, ESP 4.7, $CaCO_3$ 1.04%, organic carbon 0.22% and available N, P_2O_5, K_2O and S 140, 19.14, 158.12 and 13.80 kg ha^{-1}, respectively). Three sources (pyrites, elemental sulphur and gypsum) and three levels of S (20, 40 and 60 kg ha^{-1}) constituted nine treatment combinations having four replications in RBD. Nitrogen (30 kg ha^{-1}) and P_2O_5 (40 kg ha^{-1}) were applied at sowing. Remaining 30 kg N ha^{-1} was applied in two equal splits after 45 and 75 days of sowing (DAS) through urea. The plot size was 5x4 m. The pyrites, elemental sulphur and gypsum were mixed in soil about 21 days before sowing as per treatment so as to complete the soil reaction. At the same time irrigation was applied to maintain moisture for oxidation of sulphur. Pre-sowing irrigation was applied 2 days before sowing. Rest of the irrigation were applied at 17, 58, 91 and 125 DAS.

The effect of S sources on test weight, grain and stover yield was significant (Table 1). The maximum test weight, grain and stover yield (4.25 g, 1463 kg ha^{-1} and 3769 kg ha^{-1}, respectively), were recorded under gypsum treatment. The per cent increases in test weight were 0.19 and 0.47. Subbiah and Singh (1970) reported that gypsum was as efficient as other S sources when applied to groundnut, mustard and soybean. Bansal and Singh (1975) reported that gypsum was 82% effective in comparison to elemental S when the two sources were tried on cowpea. Chatterjee *et al.* (1985) found that application of 20 kg S ha^{-1} with 10 kg borax ha^{-1} caused 42%

Table 1. Effects of sources and levels of S on test weight, grain and stover yield of mustard

Treatments	Test weight (g)	Grain yield (kg ha^{-1})	Stover yield (kg ha^{-1})
Source of Sulphur			
Pyrite	4.20	1363	3594
Elemental sulphur	4.22	1413	3653
Gypsum	4.25	1463	3769
SEm ±	0.009	0.136	0.26
C.D. at 5%	0.026	0.398	0.77
Levels of Sulphur (kg ha^{-1})			
20	3.99	1377	3472
40	4.01	1425	3696
60	4.06	1444	3841
SEm ±	0.009	0.136	0.26
C.D. at 5%	0.026	0.398	0.77

increase in seed yield of mustard. A significant effect on test weight of grain and stover yield of mustard due to levels of S application was obtained. The maximum test weight, grain and stover yield of mustard (4.06 g, 1444 kg and 3841 kg ha^{-1}, respectively) were recorded under 60 kg S ha^{-1}, as compared to 40 and 20 kg S ha^{-1}. Akineedu *et al.* (1983) reported increase in seed yield of mustard up to 30 kg S ha^{-1} in Haryana, 20 kg in Punjab and 50 kg in Rajasthan under different locations. Increasing levels of S application (0, 75 and 150 kg ha^{-1}) significantly increased the grain and stover yield of mustard as reported by Singh and Bairathi (1980) on alluvial soils of Rajasthan.

The interaction between sources of levels of sulphur was found significant on grain yield of mustard. The treatment combination (60 kg gypsum) recorded the maximum grain yield (1494 kg ha^{-1}) as compared to other treatments and minimum (1322 kg ha^{-1}) under 20 kg pyrites. Singh *et al.* (1970) concluded that gypsum although relatively less soluble, is a good source of S fertilization to oilseed crops. Out of three sources of S, gypsum is the best source for increasing the mustard seed yield.

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