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Effect of nitrogen and sulphur on content and uptake of nutrient by mustard crop under the loamy sand soil of North Gujarat

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ABSTRACT

A field experiment was conducted at Agronomy Farm of C.P.College of Agriculture, Sardar Dantiwada Agricultural University, S. K. Nagar in a randomized block design (factorial) to study the response of mustard to nitrogen and sulphur application under loamy sand soil of north Gujarat. Three levels each of N (50, 75 and 100 kg N ha^{-1}) and four levels of S (control, 15, 30 and 45 kg S ha^{-1}) were tried. Total twelve treatment combinations were replicated four times. The results revealed that the application of N at the rate of 100 kg N ha^{-1} significantly increased N and P content in seed and stover; K content in seed and S content in stover; uptake of N, P, K, S by seed and stover. Application of nitrogen at the rate of 75 kg ha^{-1} significantly increased K content in stover. Further, the application of sulphur at the rate of 45 kg ha^{-1} significantly increased N, P and S content in seed and stover; uptake of N, P, K, S by seed and stover. The interaction effects showed that application of 100 kg N ha^{-1} and 45 kg S ha^{-1} significantly increased N content in seed and stover and S content in stover over other treatment combination. The treatment combination N_3S_4 also affected significantly on P content in seed and stover, K content in seed and stover, S content in seed, uptake of N, P, K, S by seed and stover. The treatment combination gave maximum values but they were not significantly different from other combinations.

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Key words : Nitrogen and sulphur Nutrient, Content, Uptake, Mustard

INTRODUCTION

Mustard is one of the most important oilseed crops of India but despite of recommended quantities of fertilizers, its average yield is low. In past few years sulphur has received increasing attention and about 90 districts of the country have been found deficient in sulphur. Sulphur deficiency and consequent crop responses have been observed in many crops especially in oilseed crops. Yield increase brought about by S application in India is wide spread, significant and economically attractive. A few years ago sulphur was considered as a nutrient of academic interest. But today it is of much importance to Indian agriculture. Sulphur is considered as a fourth nutrient after NPK because crops in general require sulphur just slightly less than they require P. In case of oilseeds, however, sulphur requirements can exceed those of phosphorus especially in rapeseed and mustard. In general response of mustard to S application is positive (Tandon, 1995). Wide spread 'S' deficiency is prevailing ranging from 15 to 56 per cent (Average 37 per cent) in different types of soils of Gujarat (Meisheri and Patel, 1996). Sadarasania (1992) also reported that 'S' deficiency is as high as 81 per cent in the light textured soil of North, North-West zones of Gujarat state. Nitrogen is also found insufficient in most of the Indian soils. In recent decades over 50 per cent increase in food production has been credited to fertilizer use in which nitrogen has played a major role. The interaction between nitrogen and sulphur is reported to be synergetic. Aulakh *et al*. (1980) obtained maximum yield of mustard when high rates of nitrogen and sulphur were applied together and reported significant positive nitrogen x sulphur interaction. Therefore, the experiment was conducted to study the effect of N and S on content and uptake of nutrients was studied on mustard crop on loamy sand soil of north Gujarat.

MATERIALS AND METHODS

The field experiment was conducted to study the response of mustard [*Brassica juncea* (L.) Czern and Coss] (var. GM-2) to nitrogen and sulphur application under North Gujarat Condition at the Agronomy Industrial Farm, C.P. College of Agriculture, Sardar Dantiwada Agricultural University, S. K. Nagar. The field experiment was tried under the FRBD design and replicated four times to test the different level of N (50, 75 and 100 kg ha^{-1}) and S (0, 15, 30 and 45 kg^{-1}).

The representative surface (0-15 cm) soil sample

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