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Research Article

Critical limit of sulphur for safflower in alfisols and ultisols of Jharkhand

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Summary

In a green house experiment carried out with surface soil samples (0-15 cm) collected in bulk from twenty different sites from plateau region of Jharkhand comprising the districts of Dhanbad, Giridih, Hazaribagh and Ranchi, safflower was taken as a test crop. The dry matter yield and per cent relative yield were taken. To determine the critical limit of available S in soil for safflower using different extractants standerd statistical method was followed. The critical limit of available S for different extractants for safflower were 5.2 mg kg^{-1}(0.001 M HCl), 6.2 mg kg^{-1}(0.25 M HCl), 8.6 mg kg^{-1}(NaOAc + CH_3COOH), 10.4 mg kg^{-1}(Water soluble), 13.6 mg kg^{-1}(NH_4OAc+ CH_3COOH),16.2 mg kg^{-1}(0.15% $CaCl_2$),16.8 mg kg^{-1}(1% NaCl), 19.6 mg kg^{-1}(Heat soluble), 38.2 mg kg^{-1}(CaH_2PO_4), 47.8 mg kg^{-1}(KH_2PO_4), respectively.

Key words : Sulphur, Critical limit, Alfisols, Ultisols, Extractants, Sanfflower

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Introduction

Various forms of S are in dynamic equillibria in the soil. Sulphate S has been most extensively investigated for characterizing S supplying power of the soils, essentially because of the fact that plants absorb S as sulphate. Sulphate S fraction extracted by 0.15% $CaCl_2$ is considered to be the plant available S as it significantly correlates with S uptake by many crops (Barrow, 1969). In Jharkhand soils, on the basis of 10 mg kg^{-1} Sulphate S as the critical limit , nearly 60 per cent of the soils were found deficient in available S. More than fifty per cent of the results of researches are on the four crops, namely Rice, Groundnut, mustard and soybean. No such report exists for safflower. So the present investigation was carried out to determine the critical limit of S in safflower in the soils of Jharkhand.

Resources and Research Methods

Surface soil samples (0-15 cm) were collected in bulk from twenty different sites from plateau region of Jharkhand comprising the districts of Dhanbad, Giridih, Hazaribagh and Ranchi. The collected soil samples were air-dried after mixing them thoroughly. The air-dried samples were used for filling the pots of 5 kg capacity. Green house experiment was carried out with those soils having 3 levels of S using safflower, the detail for which is given below:

– Pot size	:	5 kg capacity glazed pots
– Soil weight	:	4 kg processed soil in each pot
– Levels of treatment	:	3 (0, 30, 60 mg kg^{-1} S)
– No. of replications	:	3
– Total no. of pots	:	80
– Test crop	:	Safflower
– Variety	:	JSF-1
– Sowing	:	January, 2003