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Effect of nitrogen, potassium and sulphur on their content and uptake by sesame

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ABSTRACT

A field experiment was conducted at Agricultural Research Station, Junagadh Agricultural University, Amreli to study the effect of three levels of N (0, 50 and 100 kg ha^{-1}), K (0,40 and 80 kg K_2O ha^{-1}) and S (0, 20 and 40 kg ha^{-1}) on their content and uptake by sesame during *Kharif* 2007 in factorial RBD having three replications. There was a significant effect of nitrogen, potassium and sulphur levels on its content and uptake by sesame. Significantly, the highest content and uptake of nitrogen, potassium and sulphur by seed and stover of sesame were recorded with application of nitrogen @ 100 kg ha^{-1}, potassium @ 80 kg ha^{-1} and sulphur @ 40 kg ha^{-1}, respectively. Almost, similar trend was also observed in terms of total uptake of N,P,K and S by sesame.

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Key words : Nitrogen, Potassium, Sulphur, Content, Uptake, Sesame

INTRODUCTION

Among the different states of India, Gujarat ranks first in production of sesame. The cultivated area of sesame in Gujarat is about 3.00 lakh ha and production 1.41 lakh tones with average productivity of 470 kg ha^{-1} (Anonymous., 2008). In Gujarat, a major growing area of sesame is Saurashta and Kutch region. Sesame cultivation area have been increased in Gujarat state in general and particular in Saurashtra region, because of its short duration nature, suitable in rainfed condition and intercropping system as well as high demand in the foreign market and comparatively high price. The soils of Gujarat as well as in Saurashtra are deficient in nitrogen and sulphur and medium to high in the potassium. Balanced fertilization not only improved the yield but it also sustained soil fertility. For assessment of nutrient requirement, the content and uptake of nutrients are essential parameters. Information on effect of nitrogen, potassium and sulphur on nutrient content and its uptake by sesame is not available in this region. Hence, the present study was taken to find out the effect of N, K and S on nutrients content and uptake by sesame.

MATERIALS AND METHODS

The field experiment was conducted during *Kharif* 2007 in medium black calcareous soils at Agricultural Research Station, Junagadh Agricultural University, Amreli in factorial RBD having three replications. The experimental soil was calcareous in nature ($CaCO_3$ 100 g kg^{-1}), alkaline in reaction ($pH_{2.5}$ 8.18), clayey in texture and free from salinity ($EC_{2.5}$ 0.44 dSm^{-1}).From the fertility point of view, it was low in available N (213kg ha^{-1}), available P_2O_5 (28.0 kg ha^{-1}) and medium in available K_2O (222 kg ha^{-1}).The heat soluble sulphur status of the soil was 12.9 $mgkg^{-1}$. Twenty seven treatments combinations comprised of soil application of three levels of N (0, 50 and 100 kg ha^{-1}), K_2O (0. 40 and 80 kg ha^{-1}) and S (0.20 and 40 kg ha^{-1}). Nitrogen in the form of urea and potassium in the form of KCl, while, sulphur applied in the form of elemental sulphur prior to 25 days before sowing of crop. One half of the nitrogen as per treatment

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