



Effect of sulphur nutrition on the content and uptake of nitrogen, phosphorus and sulphur by rice (*Oryza sativa* L.) in rice-rice cropping sequence in vertisol of Karnataka

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ABSTRACT

Field experiments were conducted during *Rabi*/summer and *Kharif* seasons of 2007 at Agriculture Research Station, Gangavati (Dist. Koppal) to study the direct and residual effect of sulphur on N, P and S uptake by rice (Cv. IR-64). The results obtained in first rice crop revealed that the treatment receiving RDF + FYM (10 t/ha) + ZnSO₄ (20 kg/ha) + 50.0 kg sulphur ha⁻¹ (factomphos) registered the highest grain and straw N contents (1.33 and 0.97%), P content (0.294 and 0.144%), S content (0.235 and 0.207%) and their uptakes (65.29 and 53.08 kg ha⁻¹), (14.43 and 7.88 kg ha⁻¹) and (11.54 and 11.33 kg ha⁻¹), respectively. In succeeding rice, the same treatment recorded the highest grain and straw N contents (1.32 and 0.96%), P (0.285 and 0.130%), S contents (0.240 and 0.214%) and their uptakes (58.92 and 47.90 kg ha⁻¹), (12.72 and 6.49 kg ha⁻¹) and (10.76 and 10.22 kg ha⁻¹), respectively.

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Key words : Sulphur nutrition, Factomphos, Uptake, Straw and grain.

INTRODUCTION

Sulphur is the fourth major nutrient after nitrogen, phosphorus and potassium. At present sulphur deficiency in soils of various Indian states varies from 5 to 83% with an overall mean of 41% (Singh, 2001). Sulphur in Indian agriculture is now gaining added importance because of the recognition of its role in increasing crop production not only in oil seeds, pulses, legumes and forages but also in many cereals. The importance of sulphur nutrition is increasingly felt in enhancing the productivity of cereal crops, specially with the advent of high yielding rice varieties under intensive cropping systems and the use of high doses of high analysis fertilizers *viz*; urea, diammonium phosphate and muriate of potash. Therefore, the present study was carried out to study the direct and residual response of irrigated rice to applied sulphur, where

traditional fertilizers like single super phosphate and ammonium sulphate etc. are getting replaced by urea and diammonium phosphate.

MATERIALS AND METHODS

Field experiments were conducted at Agriculture Research Station, Gangavati, UAS, Dharwad during *Rabi*/summer and *Kharif* seasons of 2007 to investigate the direct and residual effect of applied sulphur on changes in N, P and S contents in grain and straw of rice (cv. IR-64). Composite soil sample (0-20 cm) was collected from experimental site before start of the experiment and analyzed for physical and chemical characteristics by employing standard methods. The experimental soil was medium black, had organic carbon : 4.78 g kg⁻¹, EC : 0.18 dS m⁻¹ and pH : 8.12. The available N, P, K and S

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