

Research note :

## Effect of varying levels of sulphur with and without Rhizobium on yield, quality and nutrient uptake of black gram

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**B**lack gram (*Vigna mungo* L. Hepper) a highly nutritious *kharif* pulse is grown in India since time immemorial. However, the productivity of this crop is very low, mainly because of its cultivation as a marginal crop under reduced rate of fertilizer application mostly without S. Since S and Rhizobium plays an important role in pulses. Therefore, the present investigation was planned to study the effect of S and Rhizobium on yield, quality and uptake of nutrients. The experiment was conducted during the *kharif* seasons of 2005 and 2006 on black gram at the research farm of T.D. P.G. College. The soil of the research farm was sandy loam, having organic carbon 2.9 g kg<sup>-1</sup>, N 122.35 kg ha<sup>-1</sup>, P 28.00 kg ha<sup>-1</sup>, K 220 kg ha<sup>-1</sup>, S 9.17 kg ha<sup>-1</sup> with pH 7.5. The experiment was laid out in randomized block design with three replications and four levels of S (0, 20, 40 and 60 Kg S ha<sup>-1</sup>) with and without rhizobium

inoculation. S was applied through gypsum. A uniform doze of N @ 20 kg ha<sup>-1</sup> was also applied at the time of sowing. Recommended dozes of P and K and agronomic practices for the crop were also followed. The protein % in seeds was determined by multiplying N content by 6.25 and carbohydrate % by Anthrone method (Sadasivam and Manicka, 1996).

The yield, quality and uptake of nutrients by black gram improved favorably with increasing levels of S as well as in combination with Rhizobium. As the level of S increased protein and carbohydrate % of seeds, yield and uptake of N, P and S increased significantly over control. Significant results in these parameters had also been obtained by inoculation. Maximum values were recorded in these parameters by applying 60 kg S ha<sup>-1</sup> in combination with Rhizobium and were protein (24.91%) carbohydrate (60.98%), grain yield (13.41 q ha<sup>-1</sup>), Straw yield (28.05 q ha<sup>-1</sup>), N uptake (68.93 kg

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**Table 1: Effect of varying levels of S with and without Rhizobium on yield, quality and nutrient uptake of black gram**

Treatments	Carbohydrate % in seeds	Protien % in seeds	N uptake kg ha <sup>-1</sup>	P Uptake kg ha <sup>-1</sup>	S Uptake kg ha <sup>-1</sup>	Grain yield q ha <sup>-1</sup>	Straw yield q ha <sup>-1</sup>
T <sub>0</sub>	58.173	21.08	44.12	5.32	4.12	10.27	21.91
T <sub>1</sub>	59.193	22.10	52.14	6.48	5.44	11.24	23.98
T <sub>2</sub>	60.180	22.91	59.81	8.01	6.12	11.98	25.49
T <sub>3</sub>	60.247	23.18	60.10	8.10	6.41	12.07	26.34
T <sub>4</sub>	59.143	22.44	52.46	6.27	5.01	10.89	23.08
T <sub>5</sub>	60.043	23.89	60.08	7.29	6.70	12.26	26.18
T <sub>6</sub>	60.877	24.85	68.81	8.48	7.72	13.23	27.70
T <sub>7</sub>	60.980	24.91	68.93	8.76	7.94	13.41	28.05
C.D. (P=0.05) R	0.045	0.039	0.096	0.033	0.031	0.140	0.225
S	0.063	0.055	0.135	0.047	0.044	0.198	0.319
S x R	0.090	0.078	0.192	0.068	0.062	0.280	0.451

T<sub>0</sub> no S no inoculation, T<sub>1</sub> 20 kg S/ ha, T<sub>2</sub> 40 kg S / ha, T<sub>3</sub> 60 kg S/ ha, T<sub>4</sub> Ry + no S, T<sub>5</sub> Ry + 20 kg S/ha, T<sub>6</sub> Ry + 40 kg S/ha, T<sub>7</sub> Ry+ 60 kg S/ha. (Ry = Rizobium)

**Key words :** Black gram, Sulphur, Rhizobium, Nutrient uptake