

Effect Of Rhizobium Inoculation, Sulphur, And Zinc Levels On Growth, Yield, Nutrient Uptake And Quality Of Summer Greengram (*Phaseolus Radiatus L.*)

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ABSTRACT

The experiment was conducted to study the effect of Rhizobium inoculation, sulphur and zinc levels on growth, yield, nutrient uptake and quality of summer greengram. The greengram variety NDM-1 was taken as test crop. Rhizobium inoculation, 30 Kg. S and 5 Kg. Zn ha⁻¹ produced significantly higher number of pods plant⁻¹, numbers of grains pod⁻¹, test weight grain and straw of greengram yield over control. Significantly higher N, P, K, S and Zn uptake was also recorded with the same treatment. Protein content was also increased significantly with Rhizobium inoculation, sulphur and zinc application over control. Thus, the recommendation of Rhizobium inoculation 30 Kg. S ha⁻¹ and 5 Kg. Zn ha⁻¹ can be made to the farmers of eastern Uttar Pradesh for successful cultivation of summer greengram.

Key words : Rhizobium, Sulphur, Zinc, Effect on growth, yield, Uptake and Quality of greengram

INTRODUCTION

Mungbean (*Phaseolus radiatus L.* Wilezex) is one of the most important pulse crop by virtue of its short duration and higher production per unit area in per unit time. Biofertilizer inoculum has been proved as the cheapest source of nitrogenous fertilizer input for better crop yield particularly in legumes. Sulphur influences plant growth in two ways. Firstly, acting as a nutrient and secondly by improving the soil condition. Sulphur and its compound may effect the soil pH, improve plant nutrient and a constituents of amino acids which are essential in protein synthesis. Zinc is a constituent of several enzymes such as alcohol dehydrogenase, carbonic anhydrase, proteinase and acts as a cofactor for several other enzymes play vital role in the synthesis of protein and nucleic acid and helps in the utilization of nitrogen and phosphorus in plant.. It also promotes nodulation and nitrogen fixation in leguminous crops.

MATERIALS AND METHODS

The field experiment was conducted at Instructional Farm of N.D. University of Agriculture and Technology Kumarganj, Faizabad (U.P.) during summer season of 2002. The soil was sandy loam with different chemical properties given in Table1.

The treatment comprising two levels of Rhizobium (Rh⁻ and Rh⁺), three levels of sulphur (0, 30 and 60 Kg S ha⁻¹) and three levels of zinc (0, 5 and 10 Kg. Zn ha⁻¹) were

replicated thrice in randomized block design. NDM-1

Table 1: Chemical properties of experimental field

S.No.	Properties	Value
1	pH (1:2.5)	8.35
2	EC (dSm-1)	0.48
3	Organic carbon (%)	0.55
4	Available N (Kg ha ⁻¹)	205
5	Available P (Kg ha ⁻¹)	12.5
6	Available K (Kg ha ⁻¹)	215
7	Available S (Kg ha ⁻¹)	13.5
8	Available Zn (Kg ha ⁻¹)	0.59

variety of greengram was sown in row 30 cm. apart using 25 Kg. seed ha⁻¹. An uniform dose of N and P through DAP and K through MOP applied @ 18, 46 and 20 Kg. ha⁻¹, respectively. Full dose of sulphur and zinc were applied through gypsum and zinc oxide, respectively as basal. The observation viz., plant height number of nodules plant⁻¹, number of pods plant⁻¹, number of grains pod⁻¹, test Weight, grain and straw yield were recorded. At harvest, after recording the yield data, grain and straw samples were collected and dried in an oven at 65°C and ground to powder. These samples were analysed for N, P, K, S and Zn content as per standard procedures. Finally uptake and protein content was calculated.

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