

Effect of land configuration, inorganic fertilizers and levels of FYM on quality and nutrient status of *Rabi* greengram

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ABSTRACT

An experiment was conducted at Navsari Agricultural University, Navsari during 2007-08 on clayey soil to find out the effect of *Rabi* greengram to land configuration (*viz.*, flat bed and raised bed), inorganic fertilizers (75 per cent RDF and 100 per cent RDF) and FYM levels (No FYM and FYM @ 5 t ha⁻¹). The study revealed that quality in terms of protein content and protein yield (204.56 kg ha⁻¹) as well as nutrient in relation to nitrogen and phosphorus content in seed and stover and total uptake by seed and stover were significantly highest under raised bed sowing over flat bed sowing. Among the fertilizer levels the significantly highest protein content and protein yield (208.92 kg ha⁻¹) as well as nitrogen and phosphorus content and total uptake by seed and stover were observed under application of 100 per cent RDF. Similarly protein content and protein yield (200.70 kg ha⁻¹) also nitrogen and phosphorus content in seed and stover as well as uptake by seed and stover were found significantly maximum under application of FYM @ 5 t ha⁻¹ over no FYM.

Key words : Greengram, Land configuration, Inorganic fertilizer, FYM

INTRODUCTION

Greengram is an important pulse crop grown throughout the state. It is grown in *Kharif* and summer seasons, but also cultivated in *Rabi* season in Valsad, Navsari, Surat, Bharuch and Vadodara districts as a post rainy season crop. Poor soil management is one of the major factors responsible for low productivity of crops. Therefore, land configuration can play an important role for easy and uniform germination as well as growth and development of plant. Generally greengram is usually sown on flat bed by seed drill. Several research workers have indicated that manipulation of sowing method provides better environment for germination, growth, flowering and pod development which eventually increase the yield. Fertilizer is costly but important input in crop productivity. Its proper management not only improves the efficiency of applied nutrients but also reduces the gap between addition and removal of nutrients. The use of farmyard manure (FYM) along with inorganic fertilizer increases the nutrient use efficiency and also improves the physical properties of soil. Taking into consideration these facts, an experiment was conducted to study the effect of land configuration, inorganic fertilizers and FYM levels on *Rabi* greengram.

MATERIALS AND METHODS

The field experiment was conducted at the Instructional Farm, N.M. College of Agriculture, Navsari Agricultural University, Navsari, during *Rabi* season of 2007-08. The soil of the experimental field was clayey in texture and alkaline in reaction. The soil was low in organic carbon, available nitrogen (212.5 kg ha⁻¹), medium in available phosphorus (32.20 kg ha⁻¹) and fairly rich in

available potassium (344.00 kg ha⁻¹) with 7.55 pH. Eight treatment combinations consisting of two levels of land configuration *viz.*, flat bed and raised bed. Two levels of inorganic fertilizers namely 75 per cent recommended dose of fertilizer-RDF and 100 per cent recommended dose of fertilizer-RDF and two levels of farmyard manure *viz.*, control and FYM @ 5 t ha⁻¹ were evaluated in factorial randomized block design with four replications. The greengram variety Co-4 was sown on 27 November 2007 keeping 30 cm inter-row spacing and intra-row spacing of 10 cm was maintained by thinning operation. Recommended cultural practices were also adopted as per need of crop.

RESULTS AND DISCUSSION

The results obtained from the present study as well as relevant discussion have been presented under following heads:

Effect of land configuration:

Data presented in Table 1 revealed that, different land configuration had significant effect on protein content and protein yield. Sowing on raised bed reported significantly highest protein content and protein yield (204.56 kg ha⁻¹) as compared to flat bed. This might be due to better availability of nitrogen to plant because of high root nodule formation under this treatment. The increase in protein yield is attributed to higher seed yield and protein content. Similar results were also reported by Jayapant *et al.* (1996) in soybean. Also significantly the highest N and P content and uptake by seed, stover and total were recorded under raised bed over flat bed sowing. This might be attributed to better root growth

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Table 1 : Protein content and protein yield of *Rabi* greengram as influenced by land configuration, inorganic fertilizers and FYM levels

Treatments	Protein content (%)	Protein yield (kg ha ⁻¹)
Land configuration (L)		
L ₁ = Flat bed	19.53	158.02
L ₂ = Raised bed	20.98	204.56
S.E. ±	0.32	7.58
C.D. (P=0.05)	0.96	22.31
Inorganic fertilizers (F)		
F ₁ = 75 % RDF	19.38	153.68
F ₂ = 100 % RDF	21.14	208.92
S.E. ±	0.32	7.58
C.D. (P=0.05)	0.96	22.31
FYM levels (M)		
M ₁ = No FYM (control)	19.34	161.87
M ₂ = FYM @ 5 t ha ⁻¹	21.18	200.70
S.E. ±	0.32	7.58
C.D. (P=0.05)	0.96	22.31

the inorganic fertilizers. The treatment receiving 100 % RDF resulted in significantly highest protein content (21.14%). This was because of higher content in seed which is an important constituent of protein. The application of 100 % RDF significantly increased protein yield (208.92 kg ha⁻¹) in greengram. This was attributed to higher protein content and seed yield recorded under this level of inorganic fertilizers. Almost similar findings were also reported by Ambhore (2004) in greengram.

Application of inorganic fertilizers *i.e.* 100 % RDF recorded significantly highest N and P content in seed and stover as well as highest total N and P uptake over 75 % RDF. This was due to synergistic effect of fertilization, better development of root and shoot resulted in highest N and P uptake. The present findings are inline with the findings of Ambhore (2004).

Effect of FYM level:

It is evident from Table 1 indicates that, application

Table 2 : Effect of land configuration, inorganic fertilizers and FYM levels on Nutrient content and total nutrient uptake of *Rabi* greengram

Treatments	N content (%)		P content (%)		Total N uptake (kg ha ⁻¹)	Total P uptake (kg ha ⁻¹)
	Seed	Stover	Seed	Stover		
Land configuration (L)						
L ₁ = Flat bed	3.13	0.90	0.113	0.080	43.17	159.818
L ₂ = Raised bed	3.36	1.05	0.120	0.086	57.00	194.519
S.E. ±	0.052	0.018	0.0013	0.0011	1.69	4.38
C.D. (P=0.05)	0.15	0.055	0.0038	0.0032	4.97	12.89
Inorganic fertilizers (F)						
F ₁ = 75 % RDF	3.10	0.89	0.111	0.079	42.31	158.448
F ₂ = 100 % RDF	3.38	1.06	0.122	0.087	57.87	195.889
S.E. ±	0.052	0.018	0.0013	0.0011	1.69	4.38
C.D. (P=0.05)	0.15	0.055	0.0038	0.0032	4.97	12.89
FYM levels (M)						
M ₁ = No FYM (control)	3.09	0.93	0.113	0.080	45.08	165.609
M ₂ = FYM @ 5 t ha ⁻¹	3.39	1.02	0.121	0.087	55.09	188.728
S.E. ±	0.052	0.018	0.0013	0.0011	1.69	4.38
C.D. (P=0.05)	0.15	0.055	0.0038	0.0032	4.97	12.89

due to better aeration, microbial activities and good drainage might have received optimum moisture and nutrients for its growth. Such findings are in line with the investigation of Bharambe *et al.* (2004).

Effect of inorganic fertilizers:

Quality in terms of protein content and protein yield (Table 1) of greengram were significantly influenced by

of FYM @ 5 t ha⁻¹ recorded significantly highest protein content over control. The increase in protein content was due to favorable effect of FYM on microbial activity which resulted in higher supply of nitrogen throughout the crop growth period resulted in highest protein yield (200.70). Highest protein yield is due to higher protein content. Results are in conformity with the studies of Raju *et al.* (1991). Significantly the highest N and P content in seed

and stover and total uptake were recorded by FYM @ 5 t ha⁻¹ over control. This was due to synergistic effect of FYM on nutrient uptake by plant. The results are in accordance with the findings of Reddy *et al.* (1992).

REFERENCES

Ambhore, A.P. (2004). Response of summer greengram (*Vigna radiata* L.) to biofertilizers and inorganic fertilizers under South Gujarat conditions. M.Sc. (Ag.) Thesis, Navsari Agricultural University, Navsari (Gujarat).

Bharambe, P.R., Patil, V.V., Shelke, D.K., Oza, S.R. and Sondge, V.D. (2004). Response of *Rabi* groundnut to phosphorus levels under different land layouts and moisture regimes grown on vertisols. *J. Indian Soc. Soil Sci.*, **52** (3): 262-265.

Raju, M.S., Varma, S.C. and Ramaiah, N.V. (1991). Effect of phosphorus in relation to FYM Vs. rhizobium inoculation on nutrient uptake by chickpea cultivars under rainfed condition. *Indian J. agric. Res.*, **25** (1): 43-48.

Reddy, K.M., Reddy, S.C. and Reddy, T.Y. (1992). Dry matter production, distribution and nutrient content of greengram (*Phaseolus radiatus* L.) varieties as influenced by fertility treatment. *Indian J. Agron.*, **37** (2): 268-272.

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