Madras Agric. J., 96 (7-12): 380-382, December 2009
https://doi.org/10.29321/MAJ.10.100513

Spacing and Nitrogen on Growth and Yield of Garden Bean (*Lablab purpureus var. typicus*) var CO (GB 14)

K. Vaiyapuri*, P. Veerabadhiran and N. Nadarajan
Department of Pulses
Tamil Nadu Agricultural University, Coimbatore-641 003

Field experiments were conducted at Department of Pulses, Tamil Nadu Agricultural University, Coimbatore during summer and *kharif* 2005 to find out the optimum spacing and nitrogen levels on growth and yield of vegetable garden bean (*avarai*). The experiment was laid out in split plot design. The main plot treatments were (spacing levels) *viz.*, 30 x 10 cm, 30 x 15 cm and 30 x 20 cm. The sub plot treatments were (Nitrogen levels) *viz.,* No fertilizer, 100% recommended dose of N, 50% recommended dose of N at basal +50% top dressing at 25 DAS, 50% recommended dose of N at basal + 25% top dressing at 25 DAS + 25% top dressing at 45 DAS. The entire P & K fertilizers were applied as basal. Results revealed that 30 x 15 cm spacing recorded higher green pod yield of vegetable avarai in both seasons (8448 and 9584 kg ha^{-1}) than other two spacing levels tried. With regard to nitrogen levels, application of N @ 50% as basal and 50% top dressing at 25 DAS recorded the highest green pod yield of vegetable *avarai* (7696 and 8669 kg ha^{-1}) and followed by 50% as basal and 25% each as top dressing at 25 DAS and 25% at 45DAS

Key words*:* Garden bean, spacing, nitrogen levels, yield attributes, yield

Grain legumes play an important role in meeting the requirements of dietary proteins in India. Besides, legumes are providing a concentrated source of easily digestible and high quality protein and also a valuable supplement to the cereal based vegetarian diet. They form part of unique of our farming system as they provide protein for human consumption, green nutritious fodder and enrich the soil through biological nitrogen fixation. Hence, they are rightly termed as unique jewel of Indian Crop Husbandry (Swaminathan, 1981). *Lablab purpureus* var. *typicus* (L) is one of the important indigenous legume vegetables in India grown for its fresh tender pods and green seeds. The Crop has high variability and diversity among the pole types and bushy types. There is less research on spacing and fertilizer levels. Hence, the present investigation was carried out to study the effect of spacing and N levels on vegetable avarai.

Materials and Methods

Field experiments were carried out in two seasons' *viz.,* summer and kharif 2005. The soil of the experimental field was well drained sandy clay loam in texture with a bulk density of 1.15. The field capacity and permanent wilting point were 24 and 10 per cent respectively. The pH was 8.2 and EC remained at 0.75 dSm^{-1}. The soil was low in available nitrogen (184 kg ha^{-1}) medium in available phosphorus (15 kg ha^{-1}) and high in available potassium (385 kg ha^{-1}). The normal fertilizer schedule was 25:50:0 N, P_2O_5 and K_2O kg ha^{-1}.The experiment was laid out in split plot design. The main plot treatments were (spacing levels) *viz.*, 30 x 10 cm, 30 x 15 cm and 30 x 20 cm. The sub plot treatments were (Nitrogen levels) *viz.*, No fertilizer, 100% recommended dose of N, 50% recommended dose of N at basal + 50% top dressing at 25 DAS, and 50% recommended dose of N at basal +25% top dressing at 25 DAS +25% top dressing at 45 DAS. Phosphorus was applied in full dose at 50 kg ha^{-1} as basal during both the seasons. Avarai seeds were sown in ridges and furrows with a quantity of 75 kg ha^{-1} both summer and Kharif seasons.

Results and Discussion

Growth attributes

The effect of different spacing and nitrogen levels on growth characters in both seasons is shown in Table 1. Plant height showed a significant difference due to the treatments imposed. Among the different spacing levels 30 x 15 cm recorded higher plant height than two spacing treatments during both the season (58.05 and 60.60 cm during both the seasons respectively). Application of nitrogen @ 50% basal and 50% at 25 DAS recorded higher plant growth during summer and *Kharif*. The enhancement of growth characters might be ascribed to the influence of nitrogen, which is the chief constituent of protein and an important compound of amino acids and co-enzymes which are of considerable biological importance. The results are in conformity

*Corresponding author email: vais_2005@yahoo.com

Table 1. Growth and yield attributes of garden bean (avarai) as influenced by spacing and nitrogen levels

Treatment	Plant height (cm)		No. of pods/plant		No. of seeds/pod	
	Summer	*Kharif*	Summer	*Kharif*	Summer	*Kharif*
30 x 10 cm	50.73	53.69	30.75	37.96	3.10	3.61
30 x 15 cm	58.05	60.60	37.44	44.39	3.77	3.91
30 x 20 cm	54.16	56.47	33.12	39.03	3.29	4.26
SEd	**0.80**	**1.71**	**1.12**	**1.22**	**0.22**	**0.46**
CD(P=0.05)	**2.48**	**5.31**	**3.46**	**3.79**	**0.69**	**1.44**
No fertilizer	51.77	54.07	32.08	37.86	3.21	4.42
Recommended dose of N 100 % basal	52.88	54.41	32.32	39.53	3.26	4.63
50 % basal + 50 % at 25 DAS	56.84	60.42	35.95	42.81	3.68	5.06
50 % basal 25 % each at 25 & 45 DAS	55.77	58.77	34.73	41.64	3.40	4.44
SEd	**1.89**	**5.19**	**1.47**	**1.73**	**0.16**	**0.20**
CD (P=0.05)	**3.99**	**10.23**	**3.09**	**3.64**	**0.34**	**0.43**
Interaction	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**

with those reported by Bakly, (1974) Tripathi *et al.* (1991) in pea seed crop. The interaction effect was non significant.

Yield attributes

All the yield attributes *viz.,* pod length, pod width, 100 seed weight and green pod yield were influenced by both spacing and nitrogen levels. The highest pod length, pod width and green pod yield ha^{-1} was recorded under 30 x 15 cm spacing during both the seasons (Table 2.). This might be due to proper growth and development of individual plants due to better utilization of solar radiation and plant nutrients because of optimum spacing. Similar

Table 2. Yield attributes and green pod yield of avarai as influenced by spacing and nitrogen levels

Treatments	Pod length (cm)		Pod width (cm)		100 seed wt (g)		Green pod yield (kg ha^{-1})	
	Summer	*Kharif*	Summer	*Kharif*	Summer	*Kharif*	Summer	*Kharif*
30 x 10 cm	7.04	8.64	1.73	2.02	36.35	35.21	7517	8000
30 x 15 cm	8.56	9.78	1.92	2.24	44.89	39.56	8448	9584
30 x 20 cm	7.33	8.96	1.77	2.07	38.69	37.97	7955	8448
SEd	**0.32**	**0.36**	**0.06**	**0.07**	**1.89**	**0.85**	**300**	**205**
CD (P=0.05)	**0.98**	**1.23**	**0.17**	**0.19**	**5.89**	**2.64**	**932**	**637**
No fertilizer	7.17	8.57	1.71	2.00	37.21	35.89	7534	8283
Recommended dose of N 100 % basal	7.47	9.05	1.83	2.14	38.79	36.79	7937	8329
50 % basal + 50 % at 25 DAS	8.28	10.14	1.95	2.28	43.60	41.20	8725	9429
50 % basal 25 % each at 25 & 45 DAS	7.65	8.76	1.72	2.01	40.32	36.43	7696	8669
SEd	**0.34**	**0.36**	**0.07**	**0.09**	**1.91**	**1.61**	**339**	**360**
CD (P=0.05)	**0.71**	**0.76**	**0.16**	**0.18**	**4.00**	**3.38**	**712**	**755**
Interaction	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**

result has also been reported by Jain *et al.* (1990). Efficient translocation of photosynthesis from source to sink due to optimum spacing might also be the reasons for such a result as reported by Jadhav *et al.* (1994.) With regard to split application of nitrogen applied as 50% basal and 50% top dressing recorded significantly higher test weight of 43.60 g and 41.20 g during summer and *Kharif*,

respectively. Improvement of seed weight due to split application of fertilizer was reported by Singh and Dixit (1989). Similar trend of results were observed with pod length and pod width also. The green pod yield was higher in nitrogen applied at 50% basal and 50% N at 25 DAS (8725 kg ha^{-1} and 9429 kg ha^{-1} both in summer and *Kharif* respectively). These results are in conformity with the findings of Joshi *et al.* (1991) and Ravichandran and Ramaswamy (1992). The interaction effect was non significant.

In conclusion a spacing of 30 x 15 cm and split application of 50% N as basal and 50% N at 25 DAS can be adopted to get higher green pod yield of vegetable garden bean in both summer and *Kharif* seasons.

References

Bakly, S.A. 1974. Effect of fertilization treatments on yield of Chryslar Imperial rose plants. *Agric.Res.Review,* **52**: 95-99.

Jadhav, P.J., Jadhav, A.S. and Bachchhav, S.M. 1994. Effects of N, row spacing and Plant densities on the yield and quality of soybean. *J. Maharastra Agric. Univ.,* **19**: 75-77.

Jain, N.K., Jain, H.C. and Sharma, A.K. 1990. Row spacing on black gram (*vigna Mungo* L.) in Malwa platua of Madhya Pradesh *Res. Dev. Reporter*, **7**: 37-40.

Joshi, A.J., Ahlawat, R.P.S. and Thrivedi, S.J. 1991. Effect of nitrogen and sulphur fertilization on growth and yield of mustard. *Indian J. Agron*., **36**: 606-607.

Ravichandran, V.K. and Ramaswamy, C. 1992. Response of soybean to different plant densities. *Madras Agric. J.,* **79**: 181-182.

Rhoda, E.I. 1989. Growth, yield and yield components of soybean (*Glycine max* (L.) Merrill) as influenced by sowing date and plant population. M.Sc. Thesis A.B.U., Zaria.

Singh, S.S. and Dixit, R.S. 1989. Response of mustard to various levels of irrigation and nitrogen. *Indian J. Argon.*, **54**: 307-311.

Swaminathan, M.S. 1981. Improvement of productivity and production in pulse crops. Challanges ahead. Pulse Crops Newsletter. **11**: 1-2.

Tripathi, B.M., Singh, S.W.S. and Singh, S.P. 1991. Effect of nitrogen phosphorus and weed control on growth and yield of vegetable pea. *Veg. Sci.*, **18**: 11-15.

Received: July 28, 2009; Revised: October 10, 2009; Accepted: October 13, 2009