

Effect of Different Production Factors on Growth, Yield and Economics of Greengram [*Vigna radiata* (L.) Wilczek]

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ABSTRACT

A field experiment conducted during 1996-97 and 1997-98 to assess the contribution of different production factors on grain yield of green gram (*Vigna radiata* (L.) Wilczek.) revealed that grain yield (0.2 q/ha net return (Rs. 8300/ha) and net return rupee invested (1.51) were highest when the crop was grown with complete package of practices. The lowest grain yield (4.0 q/ha), net return (Rs. 3100/ha) and net return rupee invested (1.07) were obtained on the adoption of farmers practice for greengram.

Greengram (*Vigna radiata* (L.) Wilczek) is an important pulse crop of Assam. This crop is usually grown under rainfed condition during summer and kharif season mostly in marginal and sub-marginal lands without fertilizer, weed management and plant protection measures. There are several constraints in the farmers field which often influence the effective use of modern technology in higher production of green gram which results in very low productivity. The present investigation was under taken to assess the contribution of different production factors for increasing yield of greengram.

MATERIALS AND METHODS

A field experiment was conducted during summer seasons of 1996-97 and 1997-98 at the demonstration farm of Krishi Vigyan Kendra, Assam Agricultural University, Khumtai, Golaghat. The soil of the experimental plot was sandy loam with pH 5.1, high in organic carbon, low in available potassium. The experiment was laid out with variety AAU 34 in randomized block design with 8 treatments replicated 3 times. The treatments consisted of farmers practice (sowing of seeds without fertilizer, weed management and plant protection measures) showing of inoculated seeds with only fertilizer application (10 kg N and 35 kg P₂O₅ per hectare), only weed control (2 manual weedings at 20 and 40 days after sowing), only plant protection measures (seed treatment with Bavistin and 2 sprayings with Rogor 30 E.C), fertilizer + weed control, fertilizer + plant protection, weed control + plant protection and fertilizer + weed control + plant protection (complete package of practices). In all the years sowing was done in the first week of March under rainfed condition. Harvesting was done when 75% of the pods turned darkish in colour and split on pressure. Harvesting was completed in 2 pickings.

Table 1. Effect of production factors on growth and yield attributes of green gram (mean of 2 years)

Production factors	Plant height (cm)	Pods/plant	Seeds	1000 seed weight (g)
Farmers practice	38.1	10.8	5.2	32.5
Fertilizer alone	44.2	18.3	5.7	33.2
Weed control alone	39.9	17.0	5.5	32.8
Plant protection alone	38.6	14.0	5.5	32.6
Fertilizer+Weed control	46.5	19.0	5.7	33.7
Fertilizer+Plant protection	45.5	19.0	5.5	34.2
Weed control+Plant protection	41.4	17.3	5.5	32.7
Fertilizer+Weed control+Plant protection	47.8	20.2	5.8	35.3
CD (P=0.05)	0.17	1.72	0.63	1.46

Table 2. Grain yield of green gram and economic return (Rs/ha) as influenced by production factors (mean data of 2 years)

Production factors	Grain yield (q/ha)	Increase in yield over farmers practice (%)	Decrease in yield over full package (%)	Net return (Rs/ha)	Net return per rupee invested
Farmers practice	4.0	—	57	3100.00	1.07
Fertilizer alone	7.7	93	16	6850.00	1.45
Weed control only	6.8	70	26	5800.00	1.32
Plant protection only	5.6	40	39	4300.00	1.08
Fertilizer+Weed control	8.1	103	13	7152.00	1.43
Fertilizer+Plant protection	8.0	100	13	6900.00	1.35
Weed control+Plant protection	6.8	70	26	5700.00	1.26
Fertilizer+Weed control+Plant protection	9.2	130	—	8300.00	1.51
CD (P=0.05)	1.35				

RESULTS AND DISCUSSION

Growth and yield attributes

All the growth and yield attributes were higher when greengram was grown with complete package of practices. The magnitude of reduction in growth and yield attributing characters was more when fertilizer was withdrawn from the complete package of practices. This was followed by the adoption of weed control measures alone as well as its combination with other production factors. Among different production factors, the contribution of plant protection measures on growth and yield attributes ranked third (Table 1).

GRAIN YIELD

Maximum grain yield (9.2 q/ha) was obtained when the crop was grown with complete package of practices and the increase in yield over the farmers practice was 130%. The reduction in grain yield from complete package of practices was maximum and its contribution in increasing grain yield over farmers practice was the lowest (40%) when only plant protection measures were adopted. The magnitude of reduction in grain yield from the complete package of practice was lowest (12%) when fertilizer along with weed control measures were adopted and its contribution in increasing grain yield over the farmers practice was 103%. Production factors alone as well as in combination were found significantly superior to farmers practice (Table 2). This is in conformity with the findings of Srivastava and Srivastava (1995).

ECONOMICS

Maximum net return (Rs. 8300 /ha) and net return per rupee invested (1.51) were obtained by the adoption of complete package of practices. The next higher value of the net return (Rs. 7152 /ha) and net return per rupee invested (1.45) were obtained by the adoption of fertilizer + weed control measures and by the application of fertilizer alone respectively. The net return and net return per rupee invested obtained by the adoption of farmers practice was lowest (Table 2).

REFERENCES

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