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Impact of seed cum fertilizer drill on the yield of green gram in South Bastar, Chhattisgarh

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ABSTRACT

The study was carried out during rabi season in four villages of South Bastar, Chhattishgarh during 2012-13. Frontline demonstrations (FLDs) on use of seed cum fertilizer drill for sowing green gram were carried out on an area of 5 ha by the active participation of farmers. FLDs recorded higher yield as compared to farmers' local practices. The increase in yield, technological gap, extension gap and technology index were observed during the demonstrations. The improved technology gave higher gross return, net return with higher benefit-cost ratio than farmers' practices.

Keywords: Green gram; seed cum fertilizer drill; field efficiency; field capacity; technology index

INTRODUCTION

India is the largest producer and also the largest consumer and importer of pulses. Pulses are a good and chief source of protein for a majority of the population in India. Pulses contribute 11 per cent of the total intake of proteins in the country (Reddy 2010). India accounts for 33 per cent of the world's area and 22 per cent of the production of pulses. Mung bean, *Vigna radiate* (L) Wilczek is one of the important short duration legume crops cultivated since prehistoric times in India. It is commonly known as green gram or mung bean. It is a vital crop grown throughout Asia, Australia, West Indies, South and North America and tropical and subtropical Africa. However Asia alone accounts for 90 per cent of world's mung bean production. India is the world's largest mung bean producer accounting for about 65 per cent of world's acreage and 54 per cent of its global production (Rao et al 2016). Among pulse crops, green gram (mung bean) is one of the important crops in India which plays a major role in augmenting the income of small and marginal farmers. It contains 25 per cent high digestible protein and is a soil-building crop which fixes atmospheric nitrogen through symbiotic action and can also be used as green manure crop adding 34 kg N/ha.

Adoption level of several components of the improved technology of the crop is low emphasizing the need for better dissemination (Kiresur et al 2001). Several biotic, abiotic and socio-economic constraints inhibit exploitation of the yield potential of green gram which need to be addressed. Crop growth and yield are limited through higher plant population, poor plant nutrition and uncertain water availability during the growth cycle. Inappropriate management done in cultivation of the crop may further reduce the fertility of soil (Rabbinge 1995). Frontline demonstrations on green gram using seed cum fertilizer drill were initiated with the objective of showing the productive potential of the drill under real farm situation over the locally cultivated practice.

MATERIAL and METHODS

The study was done at Krishi Vigyan Kendra, South Bastar, Chhattisgarh during rabi season 2012-2013 in the farmers' fields of 4 villages. In all twelve frontline demonstrations (FLDs) on seed cum fertilizer drill in 5 ha area were conducted in different villages. Seed cum fertilizer drill used in the FLDs possessed 9 rows with adjusting row spacing of 30 cm and having fluted roller mechanism. It was also calibrated in laboratory for proper seed rate (Plates 1, 2). The

sowing was done in Oct-Nov with seed rate of 25 kg seed/ha.

Green gram variety Pusa Visal was taken for demonstration. Seed treatment was done with *Rhizobium* culture (500 g) for seed required to be sown in 1 ha. Optimum plant population was maintained in the demonstrations. The organic fertilizers were applied as per improved practices as basal dose. Hand weeding within lines was done at 30-35 days after sowing (DAS). The crop was harvested at perfect maturity. Technology gap, extension gap and technology index were calculated as suggested by Samui et al (2000) as given below.

Technology gap= Potential yield – Demonstration yield
Extension gap= Demonstration yield – Farmers' yield
Technology index (%)= Technology gap/Potential yield x 100

RESULTS and DISCUSSION

Yield: The average yield of green gram (939 kg/ha) was much higher in the demsonstration plots than average yield of farmers' practice (726 kg/ha) (Table1). Similar results were also obtained by Poonia and Pithia (2011).

Technology gap: The technology gap between the demonstration yield and potential yield was 61 kg/ha for green gram (Table 1). Such technological gap was also reported by Mukherjee (2003)

Table 1. Yield, technology gap, extension gap and technology index of green gram under FLDs

Parameter	Observation
Area (ha)	5.00
Number of farmers	12
Yield (kg/ha)	
Potential yield	1000
Yield under improved technologies	939
Yield under local farmers' practices	726
Technology gap (kg/ha)	61
Extension gap (kg/ha)	211
Technology index (%)	6.1

Extension gap: The extension gap of 211 kg/ha was recorded. This emphasized the need to educate the farmers through various means for the adoption of improved agricultural machineries and implements for increasing production (Table 1). This finding is in accordance with the observation of Hiremath and Nagaraju (2010).

Economic return: The input and output prices of commodities prevailed during the demonstrations were taken for calculating gross return, cost of cultivation, net return and benefit-cost ratio (Table 2). The cultivation of green gram under improved technologies gave higher net return of Rs 21845/ha as compared to farmers' practices (Rs 16114). The benefit-cost ratio of green gram under improved technologies was 3.33 as compared to 3.00 under farmers' practices. This may be due to higher yield obtained using seed cum fertilizer drill compared to local check (farmers' practice).

Table 2. Economics of improved and local technologies

Parameter	Improved technologies	Local farmers' practices
Gross return (Rs/ha)	31220	24132
Cost of cultivation (Rs/ha)	9375	8018
Net return (Rs/ha)	21845	16114
B:C	3.33	3.00

Reasons for low yield of green gram at farmers' fields: Lack of popularization of seed cum fertilizer drill for sowing was found to be the main reason for low yield of green gram at farmers' fields. Also the farmers did not follow the optimum sowing time due to non-availability of quality seed. In addition to it the farmers had been sowing seed using broadcast method due to which the plant population sometimes was 2-3 times more than the recommended one. However seed cum fertilizer drill helped in sowing the seeds in rows (Plate 3).

CONCLUSION

In the frontline demonstrations there was considerable increase in grain yield over the local check. Such increase was recorded with extra expenditure of Rs 1357/ha for sowing through local practice which could be afforded even by small or marginal farmers. The extension gap was found to be 211 kg/ha. As found in the results the B-C ratio (3.33) was sufficiently high to motivate the farmers for adoption of the improved technology.

Plate 1. Adjustment of seed rate in the drill

Plate 2. Sowing green gram in field using seed cum fertilizer seed cum fertilizer drill

Plate 3. Green gram sown in line using seed cum fertilizer drill

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