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RESEARCH PAPER

Productivity and economics of moth bean variety as influenced by spacing and organics under rainfed areas

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Abstract : Churu comes under desert region of Rajasthan and agriculturally it is very important district. In Churu moth bean cultivation is very common but its productivity is very low. To establish the production potential of crop cluster front line demonstrations (CFLDs) is an appropriate tool. To increase the production and productivity of moth bean in the district, Krishi Vigyan Kendra, Gandhi Vidya Mandir, Sardarshahar, Churu-1(Rajasthan) conducted 125 demonstrations on gram during 2016-17 to 2017-18 in four adopted villages. The critical inputs were identified in existing production technology through farmers meeting and group discussions with the farmers. Average yield data of conducted CFLDs revealed that, higher yield (1767 kg ha^{-1}) was obtained in demo. Plot over local check (1364 kg ha^{-1}) and additional yield in demo plot was obtained 403 kg. Per cent increase over local check was found 29.54 per cent. Average extension gap, technology gap and technology index were found 402.33, 433.33 kg ha^{-1} and 19.69 per cent, respectively. Averages of gross and net returns of demonstration were 29.17 and 42.69 per cent higher than the farmers' practice, respectively. Most important factor B:C ratio indicates that whether CFLD technology is profitable or not. B:C ratio was found higher throughout the study and average was (3.10) in demonstration over local check (2.58). It can be concluded from the study that for dry land areas, moth bean local variety can be recommended at the spacing of 45 cm x 10 cm with 2.5 t FYM per ha application for higher yield, productivity and economic returns.

Key Words : Moth bean, Organics, CFLD, Technology gap, Extension gap, Technology index, Spacing, Productivity, Grain, Economics

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INTRODUCTION

Moth bean [*Vigna aconitifolia* (Jacq.) Marechel] is an important pulse crop of arid and semi-arid regions of India. It has multiuses and adapts to extremes or uncongenial ecological niches particularly, in areas receiving fewer rains with erratic distribution. In India, crop is extensively grown in Rajasthan mainly as a mixed crop with cotton, sorghum and other pulses. It is generally consumed as a rich source of protein and is mostly consumed by low-income consumers in rural areas. In India, it is grown on an area of 13.19 lakh ha, mostly confined to Rajasthan, Uttar Pradesh, Haryana, Punjab, Madhya Pradesh, Gujarat, Maharashtra and Karnataka with a production of 1,753 lakh and productivity of 133 kg per ha 14. It is a hot weather, drought resistant legume.

The densely matted branches, which grow horizontally and have deeply notched leaflets on long leaf

Table A : Details of package of practices followed in the cluster front line demonstration

Sr. No.	Inputs	Demonstration quantity/ha	Farmers practice quantity/ ha
1.	Farming situation	Rainfed	Rainfed
2.	Variety	RMO-257	Unidentified
3.	Land preparation	Summer deep ploughing followed by MB Plough	Summer deep ploughing are not in practice
4.	Time of sowing	First week of July	First week of July
5.	Soil treatment	Trichodrema	Soil treatment are not in practice
6.	Spacing	45 cm x 10 cm	Spacing are `not in practice
7.	Seed treatment	Carbendazim $2g^{-1}$ seed + Bio-fertilizers	No seed treatment
8.	Seed rate	12 kg ha^{-1}	15 kg ha^{-1}
9.	Method of sowing	Line sowing	Broadcasting sowing
10.	Nutrients application	16 tones FYM ha^{-1}+20:32:20:40 kg NPKS ha^{-1} + 16 kg Zn SO_4 ha^{-1}	Only use 6 tones FYM ha^{-1}
11.	Weed management	Pendimethaline (Pre-emergence)+Manual weeding	Manual weeding

branches. It thus, helps greatly in the conservation of soil, water and serve as a very efficient and suitable cover crop for checking soil erosion. The lower productivity of this crop is attributed to several factors *viz.*, growing the crop under moisture stress, marginal lands with very low inputs and without pest and disease management, non-availability of high yielding varieties and late sowing. Choosing the proper genotypes, optimum plant population and organic source are the major factors for better yield. Hence, there is a scope for improving the production potential of this crop by adopting the improved varieties, optimum plant population and use of organic manures *viz.*, farm yard manure. Keeping these points in view, the study was conducted with the following objectives.

– To study the interaction effect of moth bean spacing and organics for productivity.

– To study the economics of the system.

MATERIAL AND METHODS

The present study was carried out by the Krishi Vigyan Kendra, Gandhi Vidya Mandir, Sardharshahar, Churu-1 (Rajasthan) during *Kharif* season from 2016-17 to 2017-18 (02 years) at the farmers' fields of different ten villages of Churu of desert of Rajasthan. In total 125 cluster frontline demonstrations in 50 ha. area in different villages were conducted. Materials for the demonstrations with respect to CFLDs and farmers' practices were given in Table A.

Impact of cluster front line demonstrations moth bean in churu-1, Rajasthan:

In case of farmers practice plots, existing practices being used by farmers were followed. In general, soils of the area under study were sandy in texture and medium to low in fertility status. The CFLDs were conducted to study the gaps between the potential yield and demonstration yield, extension gap and technology index. In the present evaluation study, the data on output of chickpea cultivation were collected from CFLD plots, besides the data on local practices commonly adopted by the farmers of this region were also collected. In demonstration plots, a few critical inputs in the form of quality seed, bio-fertilizers, weedicide etc. were provided and non-monetary inputs like timely sowing in lines and timely weeding were performed. Where, in farmers practice traditional practices prevailing in the area were maintained. The demonstration farmers were facilitated by KVK scientists in performing field operations like sowing, spraying, weeding, harvesting etc. during the course of training and visits. The technologies demonstrated are mentioned in Table A and compared with local practices. The satisfaction level of participating as well as neighboring farmers' for the performance of improved variety demonstrated was also assessed. The economic-parameters (Gross return, net return and B:C ratio) were worked out on the basis of prevailing market prices of inputs and minimum support prices of outputs.

RESULTS AND DISCUSSION

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

Yield:

The data (Table 1) indicated that the cluster front line demonstration has given a good impact over the

farming community of Churu district as they were motivated by the new agricultural technologies applied in the demonstrations. Results of 125 cluster frontline demonstrations indicated that the cultivation practices comprised under CFLD *viz.*, use of improved variety (RMO-257), balanced application of fertilizers (N:P:K @ 20:32:20:40 kg NPKS ha^{-1} with 16 kg $ZnSO_4$), line sowing, timely weed management and produced on an average 1721 kg/ha chickpea yield, which was 29.63 per cent higher compared to prevailing farmers practice (1328 kg/ha). Kumar and Yadav (2007) Also reported that recommended dose of phosphorus and sulphur increase the yield and quality of moth bean.

Sell price of moth bean averaged three years 3200 Rs. per quintal:

The technology gap, extension gap and technology index were calculated using the following formulae given by Samui *et al.* (2000).

Technology gap = Potential yield - Demonstration yield
Extension gap = Demonstration yield - Yield under existing practice

$$\text{Technology index} = \frac{\text{Potential yield} - \text{Demonstration yield}}{\text{Potential yield}} \times 100$$

Potential yield of moth bean variety RMO-257 is 2300 kg/ha.

Technology and extension gap:

The technology gap observed may be attributed to the dissimilarity in the soil fertility status and weather conditions. Hence, variety wise location specific recommendation appears to be necessary to minimize the technology gap for yield level in different situations. The extension gaps ranged from 558 to 588 kg/ha during the period of demonstration emphasized the need to educate the farmers through various means for the adoption of improved agricultural production technologies to reverse this trend of wide extension gap. More and more use of latest production technologies with high yielding varieties will subsequently change this alarming trend of galloping extension gap. The present study are in line with Reddy (2010); Poonia and Pithia (2011) and Mukherjee (2003). The new technologies will eventually lead to the farmers to discontinuance of old varieties with the new technology.

Technology index:

The technology index shows the feasibility of the evolved technology at the farmers' fields. The lower value of technology index more is the feasibility of the technology. The data (Table 1) showed that maximum technology index value 25.56 per cent was noticed in the year 2017-18 followed by minimum value of technology index of 24.26 per cent in the year 2016-17, it may be due to uneven weather conditions in the area. The findings of the present study are in line with the findings of Hiremath *et al*. (2007) and Dhaka *et al.* (2010).

Economic performance:

The economics (Cost of cultivation, gross and net return) of moth bean under cluster front line demonstrations were estimated and the results have been presented in Table 2. The cluster front line demonstrations recorded higher average gross returns (Rs.34632/ha) and net return (Rs.23283/ ha) with cost: benefit ratio (3.05) compared to farmers practice as gross return Rs.23680/ ha with higher cost: benefit ratio (2.40). The present findings are in accordance

Table 1: Yield performance of moth bean under CFLDs at farmer's field

Year	Yield kg/ha		% yield increase over FP	Technology gap (kg/ha)	Extension gap (kg/ha)	Technology index %
	Demonstration	Farmer practice				
2016-17	5.35	3.75	42.66	558	413	24.26
2017-18	5.11	3.82	33.76	588	364	25.56
Average	5.23	3.78	38.21	579	393	25.15

Table 2 : Economical comparison between recommended practice and farmers practice

Year	Gross cost (Rs. ha^{-1})		Gross return (Rs. ha^{-1})		Net return (Rs. ha^{-1})		B: C Ratio	
	Demons.	F.P.	Demons.	F.P.	Demons.	F.P.	Demons.	F.P.
2016-17	11350	9850	34632	23680	23282	13830	3.05	2.40
2017-18	9223	8256	18752	13424	9529	5168	2.03	1.63
Average	10286	9053	26692	18552	16406	9499	2.54	2.01

with study of Hiremath and Nagaraju (2010); Kiresur *et al.* (2011) and Kumar (2015).

Conclusion:

It can be concluded that moth bean local variety at spacing of 45 cm x 10 cm with 2.5 t FYM ha^{-1} produced significantly higher seed yield (535 kg ha^{-1}), net returns (Rs.23282 ha^{-1}) and benefit cost ratio (3.05) under rainfed area.

REFERENCES

Dhaka, B.L., Chayal, K. and Poonia, M.K. (2010). Analysis of farmers? Perception and adaptation strategies to climate change. *Libyan Agric. Res. Center J. Int.,* **1**(6) : 388-390.

Hiremath, S.C., Patil, C.G., Patil, K. B. and Nagasampige, M. H. (2007). Genetic diversity of seed lipid content and fatty acid composition in some species of *Sesamum* L. (Pedaliaceae), *African J. Biotechnol.*, **6** (5) : 539–543.

Hiremath, S.M. and Nagaraju, M.V. (2010). Evaluation of on-farm front line demonstrations on the yield of chilli. *Karnataka J. Agric. Sci.,* **23**(2) : 341-342.

Kiresur, V.R., Ramanna Rao, S.V. and Hedge, D.M. (2011). Improved technologies in oilseeds production: An assessment of their economic potentials in India. *Agric. Econ. Res. Rev.*, **14** (2) : 95-108.

Kumar, Arvind (2015). Status and future thrust areas of rape seed mustard research in India. *Indian J. Agric. Sci.,* **75** (10) : 621-635.

Kumar, H. and Yadav, D.S. (2007). Effect of phosphorus and sulphur levels on growth, yield and quality of Indian mustard (*Brassica juncea*) cultivars. *Indian J. Agron.* **52** (2) : 154-157.

Mukherjee, N. (2013). *Participatory and action*. Concept, Publishing Company, New Delhi, 63-65pp.

Poonia, T.C. and Pithia, M.S. (2011). Impact of front line demonstrations of Chickpea in Gujarat. *Legume Research*. **34** (4) : 304-307.

Reddy, A.A. (2010). Regional disparities in food habits and nutritional intake in Andhra Pradesh, India, *Regional & Sectoral Econ. Stud.,* **10** (2): 126-134.

Samui, S.K., Maitra S., Roy, D.K., Mandal, A.K. and Saha, D. (2000). Evaluation on front line demonstration on groundnut (*Arachis hypogea* L.). *J. Indian Society of Coastal Agric. Res.,* **18** (2) : 180-183.