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Dissemination of Improved Technology of Mothbean through Front Line Demonstrations in Arid Zone

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Abstract: *The study was conducted in Bheenjwdia village of Jodhpur district of Rajasthan to disseminate the improved technology of mothbean through front line demonstration and its impact assessment. Front line demonstrations on mothbean were conducted by Central Arid Zone Research Institute, Jodhpurat 47 farmers field during 2010-11 to 2014-15.The data were collected from at 47 farmers and analyses. The results of the study showed that the yield under demonstration was 51.98 per cent higher as compared to farmer's practices.The net returns and B:C ratios on demonstration plot were 71.91 and 51.85 per cent higher respectively as compared to farmer's practices.The study suggests that for strengthening linkages with line department and converging the demonstration with Government schemes for large scale adoption of farmers' fields.*

Keywords: *Front line demonstration, technology gap, extension gap.*

INTRODUCTION

Moth bean is an important kharif pulse crop of Rajasthan; it occupies about 8.68 lakh hectare area, which accounts for 25.82 per cent of total pulse area of the state, but contribute only 17.48 per cent of total pulse production of the Rajasthan state. Mostly it is grown under rainfed conditionin the state. The average productivity of mothbean is 393 kg/ha (2014-15) in the state, which is very low as compared to other pulse crops like tur (735 kg/ha), moong (515 kg/ha), urad (556 kg/ha) and cowpea (649 kg/ha). The yield levels of mothbean crop are highly fluctuating due to monsoon and infestation of insect pests.

The Government of India and ICAR is operating various schemes for quick and effective transfer of technology to farmer's field. Among these schemes, Front line demonstrations (FLDs) is one, which emphasizes to increase production by supplying critical inputs along with improved packages of practices tested by scientists of ICAR Institutes and State Agricultural Universities (SAUs). Use of improved seed,seed rate,seed treatment, sowing time, recommended dose of fertilizer,weed control and plant protection measure giving higher yield of mothbean as compared to farmer's practices. Extending cultivation of improved varieties, getting feedback from farmers about constraints in adoption of recommended improved technologies for further research and to maximize the technology dissemination process among the farmers are some of the other important features of this programme (Nagarajan *et al.*[3]. Keeping in mind, the present study was conducted to assess the impact of front line demonstration on yield and economics of moth bean production.

MATERIALS AND METHODS

The study was carried out by Central Arid Zone Research Institute, Jodhpur during 2010 to 2014 (five consecutive years) at farmer's fields of Bheejwadia village of Jodhpur district. During these five years

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of the study, an area of 24ha was covered under front line demonstration. Primary data were collected from the frontline demonstration on moth beanconducted at farmers fields by Central Arid Zone ResearchInstitute,Jodhpur,Rajasthan. Total 47 farmers were associated under this programme. Intensive trainings were imparted to the selected farmers regarding different aspects of moth cultivation in each year. The differences between the demonstration package and existing farmers practices are mentioned in Table 1.

All demonstrations were conducted under the supervision of CAZRI scientists. In demonstration plots, use of quality's seed of improved varieties (RMO-225,CZM-3,CZM-2 and RMO-435), line sowing, seed treatment and timely weed control, as well as recommended dose of fertilizer (20 kg nitrogen + 40 kg phosphorus) were emphasized. In the demonstration, one control plot was also kept where farmers practices was carried out. All the production and protection technology other than interventions were applied in similar manner in demonstrated as well as in farmers practices. The data on output were collected from FLD plots as well as control plots and finally the yield attributes, grain yield, cost of cultivation, net returns with the benefit cost ration was worked out.

The extension gap, technology gap and technology Index was calculated by using following formulas as given by Samui *et al.* [9]:

Technology gap

= Pi (Potential yield) – Di (Demonstration yield)

Extension gap

= Di (Demonstration yield) – Fi (Farmers yield)

$$\text{Technology Index (\%)} = \frac{\text{Technology gap}}{\text{Potential yield}} \times 100$$

RESULTS AND DISCUSSION

Performance of FLD

Perusal of data indicated that the average yield of moth bean increased over the year of study in demonstration plots as well as in control plots. Highest grain yield was recorded during 2010 and lowest during 2012 (Table 2). Average grain yield of moth bean under demonstration plot was 409.83 kg/ha which is 51.98 per cent more than control (271 kg/ha). The increased grain yield in term of per cent was ranging from 27.62 to 85.10 higher over the control during five year study.

The results clearly show the positive effects of FLD over the existing practices towards enhancing the yield of moth (Table 2). Similar yield enhancement in different crops in front line demonstration has amply been documented by Jeengar *et al.*[4], Hiremath *et al.*[2], Dhaka *et al.*[1] and Patel *et al.*[6]. From these results it is evident that the performance of improved variety as found

Table 1
Comparison between demonstration package and existing farmers practices of mothbean production

		Mothbean	
S. No.	*Interventions*	*Demonstration package*	*Farmers package*
1.	Farming situation	Rain fed	Rain fed
2.	Variety	RMO-225, CZM-3, CZM-2, RMO-435	Local
3.	Seed treatment	Seed treatment with thiram 3gm/kg seed	Nil
4.	Time of sowing	1-15 July	25-30 July
5.	Method of sowing	Line sowing proper crop geometry	Broadcasting
6.	Seed rate	12-15kg/ha	20-25kg/ha
7.	Fertilizer dose	20kgN and 40kgP	Negligible
8.	Plant protection measures	Need based application of epedacholrpid to protect the crop against insect	Nil
9.	Weed management	One hand weeding at 30 DAS	One hand weeding at 30 DAS

Table 2
Variety wise yield performance of mothbean under FLDs (Improved practice-IP) and farmers Practice (FP) of the Jodhpur district

				Seed yield (kg/ha)						
Year	*Name of variety*	*Area (ha)*	*No. of Demo.*	*Potential*	*IP*	*FP*	*% increase in yield over control*	*Extension gap (Kg/ha)*	*Technology gap (Kg/ha)*	*Technology index*
2010	RMO-225	6	12	800	565	345	63.76	220	235	29.37
2011	CZM-3	6	12	800	435	235	85.10	200	365	45.62
2012	CZM-3	3	5	800	322	205	57.03	117	478	59.75
	RMO-435	3	5	800	286	205	39.51	81	514	64.25
2013	CZM-2	3	7	800	365	286	27.62	79	435	54.37
2014	RMO-225	3	6	800	486	350	38.86	136	314	39.25
	Total/Mean	24	47		409.83	271	51.98	138.83	390.17	48.76

better than the local check under same environment conditions. Farmers were motivated by results of agro technologies applied in the FLDs trials and it is expected that they would adopt these technologies in the coming years.

Technology Gap

The technology gap shows that the gap in the demonstration yield over the potential yield and it was maximum in the year 2012 (514 kg/ha) and lowest in the year 2010 (235 kg/ha). However, overall average technology gap in the study was 390.17 kg/ha (Table 2). The front line demonstrations were laid down under the supervision of CAZRI scientists at the farmers' field. There exists a gap between the potential yield and demonstration yield. This may be due to the soil fertility and weather conditions.

Hence, location specific recommendations are necessary to bridge the gap. These findings are similar to the findings of Sharma and Sharma [7] and Patel *etal.*[6].

Extension Gap

Extension gap ranged from 79 to 220 kg/ha during the period of the study emphasizes the need to educate the farmers through various means for adoption of improved agricultural production to reverse the trend of wide extension gap.

Technology Index

Technology index shows the feasibility of improved technology at the farmer's field. The lower the value of the technology index more is the feasibility of technology (Jeengaretal.[4]). Data presented in Table 2 revealed that the technology index value was varied between 29.37 to 64.25 per cent and average 48.76 per cent during the period study. Results of the present study are in consonance with the findings of Singh *et al.*[8] and Hiremath and Nagaraju[3].

Economics of Front Line Demonstrations

The economics of moth production under front line demonstrations were estimated and the results of the study have been presented in Table 3. The results of economic analysis of moth production revealed that front line demonstrations recorded higher gross returns (Rs. 15913/ha) and net return (Rs. 7161/ ha) with higher benefit ratio (0.82) as compared to local checks. The results are in accordance with the findings of Hiremath *et al.*[3], Hiremath and Nagaraju [2] and Patel *et al.*[6].

Father, additional cost of Rs. 1384 per hectare in demonstration has increased additional net returns Rs. 2995 per hectare with incremental benefit cost ratio 2.16 suggesting its higher profitability and economic viability of the demonstration. More and less similar results were also reported by Hiremath and Nagaraju[3], Dhaka *et al.*[1] and Patel *etal.*[6].

Table 3
Economics of moth bean under front line demonstration

		Cost of cultivation (Rs./ha)		Gross return (Rs./ha)		Net return (Rs./ha)		B C ratio	
Year	Name of variety	FP	IP	FP	IP	FP	IP	FP	IP
2010	RMO-225	6900	8225	10988	17995	4088	9770	0.59	1.18
2011	CZM-3	5900	7480	7038	11288	1138	3808	0.19	0.51
2012	CZM-3	7200	8475	11117	14551	3917	6076	0.54	0.71
	RMO-435	7200	8475	11117	12924	3917	4449	0.54	0.61
2013	CZM-2	8050	9725	13013	16608	4963	6883	0.61	0.71
2014	RMO-225	8950	10125	15925	22113	6975	11988	0.77	1.18
	Mean	7367	8751	11533	15913	4166	7162	0.54	0.82

CONCLUSIONS

From the above findings it can be concluded that use of scientific method of moth bean cultivation can reduce the technology gap to aconsiderable extent thus leading to increased productivity of mothbean in arid zoneof Rajasthan. Moreover, extension agencies in the arid zone need to provide proper technical support to the farmers through different educational and extension methods to reduce the extension gap for higher productivity of mothbean in arid zone.

References

Dhaka, B.L., Meena, B.S. and Suwalika, R.L (2010), Popularisation of improved maize technology through Front Line Demonstration in South-eastern Rajasthan. *Journal of Agricultural Sciences* 1(1): 39-42.

Hiremath, S.M. Nagraju M.V. and Shashidhar K.K. (2007), Impact of Front Line Demonstration on onion productivity in farmer's field. Paper presented In: National Sem Appropriate Extn. Strategy Manage Rural Resource, Uni. Agric. Science, Dharwad, December 18-20. pp 100.

Hiremath, S.M. and Nagraju M.V. (2009), Evaluation of Front Line Demonstration on onion in Haveri district of Karnataka. *Karnataka Journal of Agricultural Sciences*, 22(5): 11092-1093.

Jeenangar, K.L., Panar, P. and Pareek, O.P. (2006), Front Line Demonstration on maize in Bheelwara district of Rajasthan.*Current Agriculture* 30(1/2): 115-116.

Nagrajan, S.Singh, R.P., Singh, R. Singh, S., Singh, A, Kumar, A. and Chand, R. (2001), Transfer of technology in wheat through front line demonstration in India,A comprehensive report, 1995- 2000,directorate of wheat Research Karnal 132001, Research Bulletin No. 6: p21.

Patel, M.M., Arvind Kumar Jhajharia, B.S. Khadda and L.M. Patil (2013), Front line demonstration: An effective communication approach for dissemination of sustainable cotton productiontechnology. *Ind. J. Extn. Edu. & R.D.* 21: 60-62.

Sharma, R.N. and Sharma, K.C. (2004), Evaluation of Front Line Demonstration on groundnut (Arachis hypogeal L.). *J. Indian Society Coastal Agri. Res.* 18:180-183.

Singh, D.K. Gautam, U.S. and Singh, R.K. (2007), Study of yield gap and Level of Demonstrated crop production technology in Sagar district. *Indian Res. Journal Ext. Edu., 7*(2&3): 94-95.

Samui, S.K., Maitra, S. Roy, D.K. Mandal, A.K. and Saha, D. (2000), Evaluation of Front Line Demonstration on groundnut. *Journal of Indian Society Coastal Agricultural Research,* 18(2): 180-183.