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IMPACT OF FRONTLINE DEMONSTRATION ON SUMMER MOONG THROUGH IMPROVED TECHNOLOGY IN BHADOHI DISTRICT OF UTTAR PRADESH, INDIA

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Abstract

The present study was conducted by Directorate of Extension, SHIATS, Allahabad during 2015 and 2016 in the summer season with 20 frontline demonstrations on summer moong covering an area of 05 hectare in Bhadohi district of Uttar Pradesh to exhibit latest production technologies and compared it with farmer's practice. An attempt has also been made to know the productivity of front line demonstration and the adoption of latest production technologies by the 20 FLD farmers and 20 Non-FLD farmers. FLD farmers and non-FLD farmers were randomly selected from FLD villages. The results were compared between FLD plots and control plots. From the front line demonstrations, it was observed that the improved moong variety Samrat recorded the higher yield 6.82 q/ha and 7.39 q/ha compared to the farmers' practice variety 4.56 q/ha and 5.25 q/ha in the year 2015 and 2016, respectively. The increase in the demonstration yield over farmer's practices was 45.16%. The extension gap, technology gap and technology index were recorded 2.20 q/ha, 2.89 q/ha and 28.95%, respectively. The increment in yield of moong crop under frontline demonstrations was due to spreading of improved and latest technology *viz*. seed treatment with fungicide, seed inoculation with biofertilizers, recommended seed rate, yellow vein mosaic (YVM) resistant variety, line sowing, proper dose of fertilizers and plant protection measures. Improved technologies gave higher mean net return of ₹15644.50 per hectare with a benefit cost ratio 1.77 as compared to farmers practice (₹ 9111.00 per hectare benefit cost ratio 1.58).

Key words : Front line demonstration, moong, yield, extension gap, technology gap, technology index, BC ratio.

Introduction

According to the nutritionists, pulses are an excellent source of dietary protein and can play an important role in fulfilling requirements of rapidly increasing population. Moong is an important pulse crop that can be grown twice a year *i.e.* in *Zaid* and *Kharif* season. Among the grain legumes, it is one of the important conventional pulse crop of India. Its ranks second to chickpea (*Cicer arietinum*) amongst grain legumes from production point of view. Its seeds are more palatable, nutritive, digestible and non-flatulent than other pulses grown in the country. Moong contains 24.7% protein, 0.6% fat, 0.9% fiber and 3.7% ash. Beside being a rich source of protein, it maintains soil fertility through biological nitrogen fixation in soil and thus plays a vital role in sustainable agriculture (Kannaiyan, 1999).

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In India, the area of moong was 1.16m ha in 2010-11 with production of 0.98 m tones and its average productivity was around 356 kg/ha in year 2010-11 (Anonymous, 2011). Production of pulses in the country is far below the requirement to meet even the minimum level per capita consumption. The per capita availability of pulses in India has been continuously decreasing which is 32.5 gm/day against the minimum requirement of 80gm/day per capita prescribed by Indian Council of Medical Research (ICMR). Therefore, it is necessary to popularized improved agricultural technologies on farmer's field to increase production of pulses to meet the protein requirements of increasing population of the country.

The Government of India established a "Technology Mission on Pulses" in the year 1991-92 with the objective to enhance the pulse production and productivity. The concept of front line demonstrations was put forth under this mission. These demonstrations are conducted under the close supervision of scientists of Directorate of Extension, SHIATS, Allahabad (U.P.), India. Conducting of front line demonstrations on farmer's field help to identify the constraints and potential of the moong in specific area as well as it helps in improving the economic and social status of the farmers. The aim of the front line demonstration is to convey the technical message to farmers that if they use recommended package and practices then the yield of this crop can be easily doubled than their present level. The improved technology packages were also found to be financially attractive. Yet, adoption levels for several components of the improved technology were very low, emphasizing the need for better dissemination (Kiresure *et al*, 2001). Several biotic, abiotic and socio-economic constraints inhibit exploitation of the yield potential and those needs to be addressed. The Bhadohi district of Uttar Pradesh has sizeable area under moong cultivation but the productivity level is very low. The reasons for low productivity are poor knowledge about improved crop production and production technologies and their management practices in the farmer's field. Keeping the above point in view, the front line demonstrations on moong using improved production technologies was conducted with the objective of sowing the productivity potentials of the improved production technologies under actual farm situation.

Materials and Methods

The front line demonstration on summer moong were conducted by the Directorate of Extension, SHIATS, Allahabad during summer season 2015 and 2016 on farmer's field of adopted villages in Bhadohi district of Uttar Pradesh, India. An area of 5 ha was covered with plot size 0.25 ha under front line demonstration with active participation of 20 farmers. Before conducting front line demonstration a list of farmers was prepared from group meeting and specific skill training was imparted to the selected farmers regarding different aspects of cultivation etc. were followed as suggested by Choudhary (1999) and Venkattakumar *et al*. (2010). Material for the present study with respect to FLDs and farmer's practices has been given in table-1. In case of local check plots, existing practices being used by farmers were followed. In general, the soil of the district is sandy loam in texture, which is low organic carbon (0.02–0.46%), available phosphorus (10–12 kg/ha) and medium to high in potash. In demonstration plot, use of quality seeds of improved variety, line sowing, recommended dose of fertilizers, bio-fertilizers inoculation, timely irrigation and plant protection management were demonstrated on the farmer's field through front line demonstration of different locations. Visit of farmers and extension functionaries was organized at demonstration plots to disseminate the message at large scale. The demonstration farmers were facilitated by Directorate of Extension Scientists in performing field operations like sowing, weeding, irrigation, spraying, biofertilizers and fertilizers application and harvesting etc. during the course of training and visit. The necessary steps for selection of site and farmers, layout of demonstration etc. were followed as suggested by Choudhary (1999). The traditional practices were maintained in case of local checks. The data were collected from both front line demonstration plots as well as control plots (farmers practices) and finally the extension gap, technology gap and technology index were worked out (Samui *et al.*, 2000) as given below:

Technology Gap = Potential yield – Demonstration yield.

Extension Gap = Demonstration yield – Farmer's yield.

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

Results and Discussion

Yield attributing parameters

The yield attributing parameters like number of branches/plant and number of pods/plant of moong obtained over the years under recommended practice as well as farmers practice are presented in table 3. The number of branches/plants of moong ranged from 3 to 5 under recommended practice on farmer's field as against a ranged from 2 to 4 recorded under farmer's practice. Similarly, higher number of pods/plants were recorded under recommended practice ranged from 12 to 18 as compared to farmer's practice ranged from 8 to 10. The higher values of number of branches / plant and number of pods/plant following recommended practice as well as farmers practice was due to the use of quality seeds of improved variety, line sowing, seed treatment, biofertilizers, recommended dose of fertilizers and timely plant protection management on moong crop during both the years of demonstration similar results have been reported earlier by Yadav *et al*. (2007) and Roy *et al*. (2006).

Grain yield

The grain yield of moong obtained over the years under recommended practices as well as farmer's practice are presented in table 2. The grain yield of moong ranged from 6.82 q/ha to 7.39 q/ha with mean yield of 7.10 q/ha under recommended practice on farmer's field

Table 1 : Particulars showing the details of Moong grown under front line demonstrations and farmers practices.

S. no.	Particulars	Demonstration Package	Farmers Practice
1.	Improved variety	Samrat (P.D.M. – 139)	Local Variety
2.	Seed rate	25 kg/ha	16 – 18 kg/ha
3.	Time of sowing	20 March to 10 April	2nd fortnight of April
4.	Method of sowing	Line Sowing (25cm x 10 cm)	Broadcasting
5.	Seed treatment	Carbendazim 50 WP @ 2.5 gm/kg seed	No seed treatment
6.	Use of Biofertilizers	Seed inoculation with *Rhizobium and PSB*	No Inoculation
7.	Basal Application of fertilizers	32 kg/ha Urea + 250 kg/ha SSP	Irrational used of nitrogenous fertilizers and non application of SSP
8.	Weed Management	Pendimetheline 30 EC @ 3.3 lit /ha as pre-emergence followed by one hand weeding after 1st irrigation	Not used
9.	Control of white fly	Spray Dimethoate 30 EC @ 1.0 lit/ha	No insecticide used
10.	Control of Pod Borer	Spray Quinalphos 25 EC @ 1.25 lit/ha	No insecticide used

Table 2 : Grain yield and gap analysis of front line demonstrations on summer moong.

Year	Area (ha)	No. of farmers	Yield q/ha			% increase over farmers practice	Technology gap (q/ha)	Extension gap (q/ha)	Technology Index (%)
			Potential	Recommended Practices	Farmer's practice				
2014 – 15	2.0	08	10	6.82	4.56	49.56	3.18	2.26	31.80
2015 – 16	3.0	12	10	7.39	5.25	40.76	2.61	2.14	26.10
			7.10	**4.90**	**45.16**	**2.89**	**2.20**	**28.95**	

Table 3 : Yield parameters under demonstrations and existing farmers practice.

Yield parameters	Demonstration Package	Existing Farmers Practices
Number of branches/plant	3 – 5	2 – 4
Number of pods/plants	12 – 18	8 – 10
Test weight (gm.)	34.55 – 37.80	32.67 – 35.24

as against a yield ranged from 4.56 q/ha to 5.26 q/ha with a mean of 4.90 q/ha recorded under farmer's practice. In comparison to farmers practice, there was an increase of 49.56% and 40.76% higher grain yield of moong crop, respectively during 2015 and 2016 following recommended practice. The higher grain yield of moong crop obtained under recommended practice was due to the use of improved variety, recommended seed rate, use of biofertilizers, *i.e.* Rhizobium and PSB, recommended fertilizer dose, pre-emergence weed management etc. The similar results of yield enhancement in moong crop in front line demonstration have been documented by Lalit *et al*. (2015) and Roy *et al*. (2013).

Economics of front line demonstration

The inputs and outputs prices of commodities prevailed during both the year of demonstrations were taken for calculating cost of cultivation, net returns and benefit cost of ratio (table 4). The investment on production by adopting recommended practices ranged from − 18900 to 21500 per ha with a mean value of − 20,200 per ha against farmers practice where the variation in cost of production was − 14,975 to 16,350 with a mean value of − 15,662.50 per ha. Cultivation of moong crop under recommended practices gave higher net return of − 14,177 and − 17,112 per ha compared to − 7,141 and − 11,081 per ha under farmers practice during 2015 and 2016, respectively. The average benefit cost ratio of recommended practices was 1.77, varying from 1.75 to 1.79 and that of farmers practice was 1.58, varying from 1.48 to 1.68. This may be due to higher yield obtained under recommended practices compared to farmers practice. Similar results have been reported earlier on moong by Singh *et al*. (2012) and Pradeep (2015).

Table 4 : Economic analysis of demonstrated plots and farmers practicesl.

Year	Average cost of cultivation (Rs/ha)		Average gross return (Rs./ha)		Average net return (Rs./ha)		B : C ratio	
	Demonstrated Plots	Farmers Practice	Demonstrated Plots	Farmers practice	Demonstrated Plots	Farmers practice	Demonstrated Plots	Farmers practice
2015	18900	14975	33077	22116	14177	7141	1.75	1.48
2016	21500	16350	38612	27431	17112	11081	1.79	1.68
Average	**20200.00**	**15662.50**	**35844.50**	**24773.50**	**15644.50**	**9111.00**	**1.77**	**1.58**

Extension and technology gap

The extension gap showed an increasing trend. The extension gap ranging between 2.26q/ha to 2.14 q/ha during the period of study emphasizes the need to educate the farmers through various means for adoption of improved agricultural production technologies to reverse the trend. The average extension gap was observed 2.20 q/ha. The technology gap is the difference between the demonstration yield and potential yield. The technology gap ranged between 3.18q/ha and 2.61q/ha during the study period. This gap exists due to variation in the soil fertility and climatic conditions. The average technology gap was observed 2.89 q/ha. These findings are similar to the findings of Lalit *et al*. (2015), Bhagwan and Chauhan (2006) and Howal *et al*. (2010). Technology index showed the feasibility of evolved technology at the farmer's field. The lower is the value of technology index, the more is the feasibility of technology demonstrated (Sagar and Chandra, 2004). The wider in technology index ranging between 31.80% and 26.10% during the period may be attributed to the difference in the soil fertility status, weather condition and insect–pest attack on the crop. The results of the present study are in recurrence with the findings of Lalit *et al*. (2015).

Conclusion

The productivity enhancement under front line demonstration over traditional method of summer moong cultivation created greater awareness and motivated the other farmers to adopted appropriate production technology of summer moong in adopted district. The selection of specific technology like improve variety, seed treatment, seed inoculation with biofertilizers *i.e.* Rhizobium and PSB, recommended dose of Phosphorus, Pre-emergence weed management and plant protection measure were undertaken in a proper way. Frontline demonstration was effective in changing attitude of farmers towards pulse cultivation. Cultivation of demonstrated plots of summer moong with improved technologies has increased the skill and knowledge of the farmers. Front line demonstration also helped in replacement of local unrecommended varieties with improved recommended varieties. This also improved the relationship between farmers and scientist and built confidence between them.

References

Lalit, M. Patil, D. J. Modi, H. M. Vasava and S. R. Gomkale (2015). Evaluation of Front Line Demonstration programme on green gram variety Meha (IPM 99 – 125) in Bharuch district of Gujrat. *10SR Jr. of Agri. And Vet. Science*, **8(9)** : 01 – 03.

Anonymous (2011). *Agricultural Studies Division, Directorate of Economics and Statics*, Department of Agriculture and Cooperation, U.P. India.

Kannaiyan, S. (1999). *Bioresource technology for sustainable agriculture*. Associated Publicity Company New Delhi, p.p. 42 2.

Samui, S. K., S. Mitra, D. K. Roy, A. K. Mandal and D. Saha (2000). Evolution of front line demonstration on groundnut. *J. Indian Soc. Coastal Agric. Res*., **18 (2)** : 180 – 183.

Choudhary, B. N. (1999). *Krishi Vigyan Kendra – A Guide for KVK Managers*. Publication, Division of Agricultural Extension, ICAR, 73 – 78.

Yadav, V. P. S., R. Kumar, A. K. Deshwal, R. S. Raman, B. K. Sharma and S. L. Bhela (2007). Boosting pulse production through frontline demonstration. *Indian Res. J. Extn. Edu.,* **7 (2 and 3)**.

Roy Burman, R., S. K. Singh, Lakhan Singh and A. K. Singh (2006). Adoption of improved pulses production technologies and related constraints in Uttar Pradesh. *Indian J. Pulses Res*., **19 (1)** : 104 – 106.

Raj, A. D., V. Yadav and J. H. Rathod (2013). Impact of front line demonstrations on the yield of pulses. *International Journal of Scientific and Research Publications*, **3(9)**.

Singh, Jagmohan, B. S. Dhillon, Astha and Parvindar Singh (2012). Front line demonstration. An effective tool for increasing the productivity of summer moong in Amritsar district of Punjab. *Asian J. Soil Sci.*, **7(2)** : 315 – 318.

Pradip, Pagaria (2015). Role of front line deomonstration on transfer of moong production technologies in Barmer district of Rajasthan. *Agriculture Update*, **10(3)** : 245 – 248.