

Original Research Article

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## Impact of Front Line Demonstration on the Yield and Economics of Soybean crop in Shajapur District of Madhya Pradesh, India

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### ABSTRACT

#### Keywords

Front line demonstrations,  
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BC ratio

#### Article Info

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Front line demonstrations on soybean were organized consecutively for three years in kharif seasons of 2014-15, 2015-16 and 2016-17 under the operational area Krishi Vigyan Kendra, Shajapur village namely Bhadoni, Gopipur, Loharwas, Tilwadgovind and Girwar in Shajapur district of Madhya Pradesh. The package of improved practices demonstrated, including variety JS 95-60, integrated nutrient management (@ 20:60:20::N:P2O5:K2O:S kg/hac + rhizobium @ 5 g/kg + PSB 5 g/kg of seed) integrated pest management (deep ploughing during April + seed treatment with *Trichoderma virde* @ 5 g/kg seed + trizophos @ 750 ml ) and sowing on ridge and furrow method. The results revealed that the FLD recorded higher yield as compared to farmers practice over the year study. The improved technology recorded average yield of 1638 kg/ha which was 26.97 percent higher than that obtained with farmers practice of 1305 kg/ha. The improved technology gave higher gross return of Rs/ha 50032, net return of Rs/ha 28915 with benefit cost ratio 2.41 as compared to the farmers practice give low gross return of Rs/ha 39798, net return of Rs/ha 19648 with benefit cost ratio 2.

### Introduction

Soybean [*Glycine max* (L.) Merrill], also known as golden and wonder and wonder bean due to presence of 40-44% protein, 20% oil and 5% lysine. It belongs to oilseed group and occupied third place among oilseed crops in Madhya Pradesh. Being known as 'Soya State', Madhya Pradesh contributes 54.00 lakh hectare area, 45.50 lakh tonnes production and 1310kg/ha productivity to

soybean (SRK Singh *et al.*, 2019).The Indian council of Agricultural research introduced the concept of First Line Demonstration under Oil seed technology mission during 1990-91. Later on this concept was rearranged and termed as front line demonstrations (FLD). Demonstrations were carried out under the close supervisions of agricultural scientists belonging to ICAR Institutions, national research centres, project Directorate Krishi Vigyan Kendras and State agricultural

universities in order to transfer the particular technology and get feedback from the farmers with respect to its feasibility, acceptability, profitability, adoptability etc. The feedback will help the scientists to reorient their research programmes as well as refinement of the technology as per the need of the farmers. Field demonstrations are an effective way to disseminate the latest technology among the farming community (Gautam *et al.*, 2007). The scientist and farmers are concern with the low productivity of Soybean under present agro situations. In order to overcome these problems it is needed to educate and bring out the facts of the cultivation practices in the notice of the farmers through demonstration of improved production technology at their field so that they may augment technology based on seeing is believing it will develop the faith among the growers (Singh *et al.*, 2018). Thus, keeping the above views in mind and realizing the importance of FLD in dissemination of technology the study was carried out to know the effect of demonstration conducted at different locations on the production and profitability of the farmers.

### **Materials and Methods**

KVK Shajapur organized 36 FLDs (0.4 ha each) during three consecutive in kharif 2014 to 2016 on improved package of practices on farmers fields in adopted villages namely, Bhadoni, Gopipur, Loharwas, Tilwadgovind and Girwar of Shajapur district through the information generated from Participatory Rural Appraisal (PRA). The package of improved practices demonstrated encompassed a new variety of soybean (JS 95-60), integrated nutrient management (@ 20: 60: 20: 20:: N: P<sub>2</sub>O<sub>5</sub>: K<sub>2</sub>O: S kg/ha + rhizobium @ 5g/kg seed + PSB @ 5 g/kg of seed), integrated pest management (deep ploughing during April + seed treatment with *Trichoderma viride* @ 5 g/kg seed + trizophos

@ 750 ml/ha) and sowing on ridge and furrow method. With row to row spacing of 30 cm and using seed @ 80 kg per ha, soybean crop was sown between 25th June to 10th July. An entire dose of NPK and sulphur through ZnSO<sub>4</sub> was applied as basal before sowing. Under farmers practice existing variety JS 335, was planted on ridge and furrow method without any seed treatment with fungicides and biofertilizers, using higher seed rate (110-120 kg/ha), broadcasting of DAP at 20 days after sowing (DAS), and following injudicious use of insecticide and weedicide. Training was imparted to the farmers of respective villages with respect to envisaged technological interventions before conducting the demonstrations (Bhargava *et al.*, 2015). Site selection, farmer's selection, layout of demonstration and farmers participation were considered according to Choudhury (1999). Other parameters like harvest index, technology gap, extension gap and technology index (%) were worked out as suggested by Kadian *et al.*, (1997) using following formulae.

Technology gap (kg/ha) = Potential yield - Demonstration yield

Extension gap (kg/ha) = Demonstration yield - Farmers yield

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

The economic analysis was done by working out cost of cultivation utilizing the inputs and output prices of commodities which prevailed during three years of demonstration, gross and net returns, and benefit cost ratio.

### **Results and Discussion**

The results revealed that the seed yield of soybean recorded was in the range of 1360 to 1820 kg per ha (average 1638 kg/ha) by

adoption of improved package of practices as compared to farmer’s practice of 976 to 1500 kg per ha (average 1305 kg/ha). In comparison to farmer’s practice, an increase of 20.58 to 39.00 per cent (average 26.97 %) in seed yield was recorded during the study period due to improved package of practices. The technological gap were found 180, 640, and 267 kg per ha during the year 2014, 2015 and 2016, respectively with an average of 362 kg per ha (Table 1). The technology gap observed may be attributed to dissimilarity in the soil fertility status and local climatic conditions. Similarly extensions gap of 320,

384 and 294 kg per ha were observed during 2014, 2015 and 2016, respectively. On an average the extension gap was observed 333 kg per ha, which emphasized the need to educate the farmers through various extension activities for adoption of improved agricultural production to narrow it. The technology index varied from 9.00, 32.00 and 13.35 per cent with an average of 18.11 per cent during the three years of FLD program, which showed the efficacy of technical interventions. This will accelerate the adoption of technological intervention to increase the yield performance of soybean.

**Table.1** Productivity, technology gap, extension gap and technology index of soybean under FLDs

Year	Area (ha)	No. of Demo	Yield (kg/ha)			% increase over FP	Technology gap (kg/ha)	Extension gap (kg/ha)	Technology index (%)
			Potential *	IP	FP				
2014-15	5	12	2000	1820	1500	21.33	180	320	9.00
2015-16	5	12	2000	1360	976	39.00	640	384	32.00
2016-17	5	12	2000	1733	1439	20.58	267	294	13.35
<b>Average</b>			<b>2000</b>	<b>1638</b>	<b>1305</b>	<b>26.97</b>	<b>362</b>	<b>333</b>	<b>18.11</b>

**Table.2** Economic evaluation of demonstrated package of practices

Year	No. of Demonstration	Gross Expenditure (Rs/ha)		Gross return (Rs/ha)		Net return (Rs/ha)		B:C Ratio	
		IP	FP	IP	FP	IP	FP	IP	FP
2014-15	12	18200	17500	54600	45000	36400	27500	3.00	2.57
2015-16	12	19650	18100	43520	31232	23870	13132	2.21	1.72
2016-17	12	25500	24850	51975	43162	26475	18312	2.03	1.73
<b>Average</b>		<b>21117</b>	<b>20150</b>	<b>50032</b>	<b>39798</b>	<b>28915</b>	<b>19648</b>	<b>2.41</b>	<b>2.00</b>

IP -Improved package of practices, FP – Farmers practices

Economic analysis (Table 2) revealed that adoption of improved package of practices required an additional cost of Rs 967 per ha over farmer’s practice. This additional cost led to increased average net returns by Rs 9267 per ha, which was higher by about 60 per cent over farmer’s practice. The benefit cost ratios of under recommended practices were higher (2.03-3.00) than farmer’s practice

(1.72-2.57). This may be due to higher yields obtained under recommended practices compared to farmer’s practices. Meena *et al.*, (2011) reported that 23.32 per cent increase in yield under improved technologies was observed over farmers practices, Bhatnagar (2001) reported that the research emanated production technologies were capable of enhancement of productivity of soybean by

32.26 per cent through frontline demonstration. Similarly Raghuwanshi *et al.*, (2009 & 2010), Badaya *et al.*, (2017) and Singh *et al.*, (2019) also observed enhancement in the productivity of soybean by adoption of improved technology over farmers practices.

In conclusion on the basis of the study it may be concluded that the yield was higher on FLD plots as compared to farmers' practise. Also the farmers can earn more from the cultivation of demonstrated variety instead of local check. Scientific method reduces technology gap and increases productivity. Hence, technical support should be provided to the farmers through different extension methods to reduce extension gap. In nutshell, the result of front line demonstrations on the package of practices suggested that by its adoption, the farmers can realize higher yields and net profit in soybean cultivation.

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