ECONOMIC EVALUATION OF FRONT LINE DEMONSTRATION ON SOYBEAN CULTIVATION IN MADYA PRADESH

ABSTRACT

Krishi Vigyan Kendra, Shajapur has conducted 60 front line demonstrations of soybean cultivation on the farmer's field during 2012-13 though 2016-17 to transfer new scientific soybean cultivation technology among the famers of shajapur district. The result revealed that the improved varieties of soybean JS- 335, JS-93-05 and JS-95-60 has reported 9.06 per cent, 14.03 per cent and 10.14 per cent respectively higher yield under demonstrated plot than farmer practices. The increasing productivity was observed under recommended technology over the check plots i.e. 18.18 per cent, 7.63 per cent, 11.50 per cent and 13.04 per cent during 2012-13, 2013-14, 2014-15 and 2015-16 respectively. The productivity was found better under demo plot as compare to local practices. Therefore, soybean cultivation has broad scope to increase the area and production in shajapur district. The demonstration has raised an additional income of the farmer Rs 4500 to 11000 per ha and 3.49 to 4.68 increment benefit cost ratio.

Key words: Front line demonstration, soybean, productivity, Net income.

INTRODUCTIN

Soybean is the major oilseed crop of Madhya Pradesh that boosted the economy of the state. It is legume crop but widely grown for oil purpose. It has great potential as a kharif season oilseed. Besides being a rich source of protein, they are also important for sustainable agriculture enriching the soil through biological nitrogen fixation. These crops fit well in the various cropping system without disturbing the main cereal crops. Hence, it is need of the day that we concentrate in developing high yield varieties with matching production technologies. During 2019-20 the area under the soybean crop was 12198.71 thousand ha on the production 11225.85 thousand MT with productivity level of 921 kg/ha in Madhya Pradesh state (www.sopa.org). Even though, a wide gap exited in the potential yield and farmers' yield on soybean crop in Madhya Pradesh. In view of this, Krishi Vigyan Kendra, Shajapur conducted the front line demonstration (FLD) on soybean crop to know the yield gaps between FLDs and farmers' field, extent technology adoption. The area under soybean was very high of Madhya Pradesh productivity but very low due to non availability of seeds of improved variety, poor management and biotic and a biotic stress. The main aims of organizing these FLDs in farmers field to bridge wide gap between demonstration field yield and famers yield and popularizing the cultivation of soybean in large area of Shajapur district of Madhya Pradesh.

METERIAL AND METHOD

A total of 60 front line demonstrations were organized by the Krishi Vigyan Kendra in the Shajapur district of Madhya Pradesh to demonstrate the impact of research emanated

production technology on soybean productivity over four years during kharif season from 2012-13 to 2015-16. The year 2012-13(15), 2013-14(15), 2014-15(15) and 2015-16(15) were laid out covering different villages of the Shajapur district. The improved package of practices included improved varieties (JS-335, JS-93-05 and JS-95-60) seed treatment with fungicides (thiram carbendazim in 2:1 ratio @ 3gm/kg seed) and inoculated with bio fertilizer (phosphorus solubilizing bacteria cultures) recommended dose of fertilizer (20:20:20 NPK) and pest management (one spray at imadachloropid at 25 DAS + one spray of trizophos at 45 days.

The soil of the demonstrations belongs to verity soils with low to medium fertility and grown to soybean- wheat / chickpea cropping system. Each front line demonstration was laid out on 0.4 ha area adjacent was considered as comparison farmers practices.

The demonstrations were planted between 20 June to 5th July with seed rate 80-100 Kg/ha. The recommended dose of NPK through 12:32:16 NPK per hectare was applied as basal. The selection of cultivators was done on the basis at Participatory Rural Appraisal (PRA) action plan and care has been taken to lay out the demonstration on road side to facilitate the demonstration of technology.

To evaluate the performances of soybean cultivation under these demonstrations and the farmers' practices, the yield data were collected from the same practices by random crop cutting method and analysis was done by using simple statistical tools. The farm profitability and B: C ratio was calculated by using the formula as given below:

1: Percent increase=Demonstration yield- farmers yield/ Farmers yield X 100
2: For estimation of cost of cultivation, Cost concepts were used
3: Net Farm Income= Gross income – Cost 'C3'
4: Benefit Cost Ratio= Gross income / Total expenses (Cost C3)

RESULT AND DISCUSION

Varieties

Among soybean varieties presented (Table-1), variety JS-335 has reported highest yield 17.88 q/ha. The next best was JS-93-05 (17.34 q/ha) followed by JS-95-60 with (16.17 q/ha). Varieties JS-93-05, JS-95-60 and JS 335 recorded 14.30, 10.14, land 9.06% respectively higher seed yield under recommended package at practices over local checks with farmer practices.

Table -1 Performance of improved soybean varieties against local varieties on farmer's fields.

Varieties	Yield (q/ha)		Yield of local Checks (q/ha)	Percentage increase in yield over check
	Highest	Average		
JS-335	20.40	17.88	16.32	9.06
JS-93-05	18.60	17.34	15.17	14.30

JS-95-60	19.50	16.17	16.17	10.14

Grain yield

The productivity of soybean cultivation ranged from17.30 q/ha to 28.50 q/ha with highest were yield 28.50 q/ha under recommended improved production and production technologies. The data indicated that (Table-2) grain yield at 19.50 q/ha, 20.03 q/ha, 18.34 q/ha and 14.18 q/ha could be obtained with improved technology as compared of 16.5 q/ha, 18.50 q/ha, 16.23 q/ha and 12.33 q/ha with local practices during 2012-13, 2013-14, 2014-15 and 2015-16 respectively. The productivity was found to be increased under the demonstration plots over the check plots 18.18%, 7.63 %, 11.50 % and 13.04% during 2012-13, 2013-14, 2014-15 and 2015-16 respectively. The higher yield of soybean could be attributing to adopt high yielding varieties, seed treatment, balance dose of fertilizer, weed control IMP and IDM control measures. These results are supported by Raj *et al.* (2013), Hiremathetal (2010), Mishra *et al.* (2009) and Raghuwanshi *et al.* (2010).

Table -2 Performance of improve technologies of soybean cultivation on productivity through demonstrations

Year	No. of farmers	Yield (q/ha)				Increase over local check (%)
		Highest	Lowest	Average	Local check	
2012-13	15	20.40	14.30	19.50	16.50	18.18
2013-14	15	28.50	15.60	20.03	18.50	7.63
2014-15	15	19.30	15.80	18.34	16.23	11.50
2015-16	15	17.30	11.50	14.18	12.33	13.04

Economic parameter

The economic analysis made on the basis prevailing market rates (Table-3) showed that the demonstration gave higher net return of Rs. 46000/ha, Rs.44000/ha Rs. 41863/ha and Rs.32376/ha as compared to Rs. 35000/ha, Rs. 39500/ha, Rs.35700.ha and Rs. 25446/ha under local practices in the corresponding seasons. An addition income per ha was generated Rs.11000 in the year 2012-13, Rs.4500 in 2013-14, Rs.6163 in 2014-15 and Rs.6910 in 2015-16. As far as cost of cultivation was concerned, on an average 830 Rs per ha addition cost was observed under improved practices. Incremental benefit cost ratio under demonstration was observed 4.68, 3.75, 4.22 and 3.49 as compared with local check 3.85, 3.59, 3.81 and 3.29 during 2012-13, 2013-14, 2014-15 and 2015-16 respectively years. These finding are supported by Raj *et al.* (2014), Jeengar *et al*. (2006) and Tiwari *et al*. (2006).

Table-3 Cost of cultivation, net return and B: C ration under improved and local management practices

Year	Cost of cultivation (Rs/ha)		Net return (Rs/ha)		Additional cost of cultivation (Rs/ha)	Additional net Return Rs/ha	Incremental Benefit Cost ratio	
	Demo	Local check	Demo	Local check			Demo	Local check
2012-13	12500	12200	46000	35000	300	11000	4.68	3.85
2013-14	16000	15200	44000	39500	800	4500	3.75	3.59
2014-15	13000	12700	41863	35700	300	6163	4.22	3.81
2015-16	13000	11080	32376	25466	1920	6910	3.49	3.29

Conclusion

The result of front line demonstration of soybean have clearly showed that growing of soybean variety JS-335, JS-93-05 and JS-95-60 under improved management practices including proper seed rate, seed treatment weed control, recommended fertilizer, IMP, IDM proved more productivity and remunerative then that grown with additional practices. On the basis of result, farmers were motivated to adopt new technology which applied under front line demonstration

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