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AN IMPACT ASSESSMENT OF FRONTLINE DEMONSTRATIONS (FLDS) ON SOYBEAN GROWERS

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ABSTRACT

Frontline demonstration (FLD) is one of the most important and powerful tools for transfer of technology. Keeping in view of an effective extension approach of FLDs for dissemination of soybean technology, an impact assessment of FLDs conducted by KVK, Anta-Baran was assessed. An impact evaluation was based on the comparison of beneficiary and non-beneficiary respondents with reference to increase in knowledge level of beneficiary farmers and extent of adoption of improved soybean production technologies. The constraints in adoption soybean production technologies that perceived by the respondents was also measured. It was found that the level of knowledge of beneficiary farmers regarding different improved soybean production technologies was higher than non-beneficiary ranging from 1.00 MPS of time of sowing to 13.11 MPS of weed management. The overall non- significant difference was found in knowledge level of beneficiary and non beneficiary farmers. The difference in extent of adoption level between beneficiary and non- beneficiary farmers ranged from MPS 2.66 to 20.89. The highest and significant difference was observed in adoption of weed management (MPS 20.89) followed by seed treatment (MPS 19.71), seed rate & spacing (MPS 18.85), plant protection measures (MPS 15.44), and soil treatment (MPS 14.86), respectively. The overall difference in extent of adoption level between beneficiary and non- beneficiary respondents was MPS 11.44 which was considered as significant. The study also revealed that high infestation of insect-pest and diseases, high weed competition to the crops, unavailability of labour due to MNREGA programme, unavailability of disease and insect-pest resistance variety and lack of skills for application of insecticide and other chemicals were important constraints in adoption of soybean production technology as perceived by both category of the respondents.

INTRODUCTION

Soybean is one of the important oil seed crops of the world. It was originated in China and was introduced to India centuries ago through Himalayan routes and also brought in via Barma (now Myanmar) by traders of Indonesia. Soybean is an important oilseed crop which ranks third in oilseed after groundnut and rapeseed/ mustard in India. After palm oil, soybean oil in its crude form is the most traded oil in international market. Soybean oil is basically used in cooking as edible oil. Soybean contains about 20 per cent oil and 40 per cent high quality protein (as against 7.0 per cent in rice, 12 per cent in wheat, 10 per cent in maize and 20-25 per cent in other pulses). In addition, it contains a good amount of minerals, salts and vitamins (thiamine and riboflavin) and its sprouting grains contain a considerable amount of vitamin C and vitamin A in the form of precursor carotene, which is converted into vitamin A in the intestine. Soybean oil is used for manufacturing of vanaspati ghee and several other industrial products. It is widely used in the industrial production of different antibiotics. It maintains the soil fertility by fixing large amounts of atmospheric nitrogen through the root nodules, and also through leaf fall on the ground at maturity. Soybean cultivation in India was negligible until 1970, but it grew rapidly thereafter, crossing over 9.670 million hectare in 2009. This has made India the fifth largest producer of soybean in the world today. Production of soybean in India at the present time is restricted mainly to Madhya Pradesh, Uttar Pradesh, Maharashtra and Rajasthan. The average yield of soybean is less in India, which is about 1 tons per hectare as compared to 2.3-3.8 tonnes per

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hectare in other countries. Area under soybean cultivation in Rajasthan is 7.65 lacs hectares with the production of 11.18 lacs tonnes. Soybean is a major kharif crop in Baran district of Rajasthan, which is grown over 1.95 lacs hectares area with the production of 3.57 lacs tonnes during 2010-11.

Frontline demonstration is one most important and powerful tools of extension because, in general farmers are driven by the perception that 'learning by doing' and 'seeing is believing'. The main objective of front line demonstrations is to demonstrate newly released crop production and protection technologies and its management practices in the farmers' field under different agro-climatic regions and farming situations. Keeping in view of an effective extension approach of FLDs for dissemination of soybean production technology, it was thought that impact of FLDs conducted by KVK, Anta-Baran has to be assessed. Therefore, the present study was undertaken with the following specific objectives:

1. To study the increase in knowledge level about soybean production technologies of beneficiary in comparison to non beneficiary farmers.
2. To assess the extent of adoption level of soybean production technologies by beneficiary in comparison to non beneficiary farmers.
3. To find out constraints faced by the farmers regarding adoption of soybean production technologies in Baran district of Rajasthan.

RESEARCH METHODOLOGY

The frontline demonstrations on oilseed were conducted by several institutes or organizations in Rajasthan but due to paucity of time and proximity, study was confined to FLDs conducted by KVK in Baran district of Rajasthan. For the purpose of investigation, ten villages of Baran district, where FLDs were conducted during preceding three years were selected. A sample of 100 respondents was taken comprising 50 beneficiary and 50 non- beneficiary farmers. For selection of beneficiary farmers, a list of farmers where FLDs on soybean were conducted during 2006-07, 2007-08 & 2008-09 was prepared and taking equal representation, five beneficiary farmers from each of the selected villages making fifty respondents were selected randomly. For the other half of samples (50 non- beneficiary farmers) were selected randomly from the villages adjacent to KVK, where FLDs were not conducted by any institute or organization. The data were collected through personal contact with the help of well structured interview schedule. The gathered data were processed, tabulated, classified and analyzed in terms of mean percent score and ranks in the light of objectives of the study. Ten and more than 10 percent difference between beneficiary and non-beneficiary farmars was considered as significant difference.

RESULTS AND DISCUSSION

It is assumed that the knowledge of a farmer to large degree depends upon the extent of exposure given to him about the technology. The FLDs conducted on soybean crop by KVK, Baran might improved have knowledge of farmers about soybean production technology. Therefore, efforts were made to assess the knowledge level of beneficiary as well as non-beneficiary farmers regarding soybean production technologies. The knowledge of the respondents about improved package of practices was measured in terms of mean percent scores (MPS). Total eleven practices were included to assess the knowledge as given in Table1.

The data in the Table1 depict that both type of respondents possessed maximum knowledge regarding high yielding variety, time of sowing and field preparation of soybean crop. The mean percent scores of knowledge of the beneficiary farmers varied from 70.86 to 95.20, while in case of non-beneficiary farmers, the mean percent scores varied from 58.28 to 92.67. This indicates a little gap of knowledge between both the categories of respondents. The data further revealed that knowledge of the beneficiary farmers regarding practices like harvesting & storage, irrigation management, fertilizer management, weed management, seed rate & spacing, and seed treatment was found to be 92.67, 92.40, 92.14, 91.11, 90.86 and 86.86 mean percent score, respectively.

Incase of non-beneficiary famers, the knowledge regarding fertilizer management, irrigation management, harvesting & storage, seed treatment, and seed rate & spacing, was found to be 89.28, 88.71, 88.33, 83.43 and 82.28 mean percent score, respectively.

Table 1. Level of knowledge of the respondents about improved soybean production technologies

S. N	Soybean production technology	Max. Score	Beneficiary (n=50)		Non- Beneficiary (n=50)		Difference
			MPS	Rank	MPS	Rank	
1	High Yielding Variety	15	95.20	I	92.67	I	2.53
2	Field Preparation	05	93.20	III	89.20	III	4.00
3	Soil Treatment	07	70.86	XI	58.28	XI	12.58*
4	Seed Treatment	07	86.86	IX	83.43	VII	3.43
5	Time of Sowing	06	93.33	II	92.33	II	1.00
6	Seed Rate & Spacing	07	90.86	VIII	82.28	VIII	8.58
7	Fertilizer Management	14	92.14	VI	89.28	IV	2.86
8	Irrigation Management	05	92.40	V	88.71	V	3.69
9	Weed Management	09	91.11	VII	78.00	IX	13.11*
10	Plant Protection Measures	19	84.21	X	72.63	X	11.58*
11	Harvesting & Storage	06	92.67	IV	88.33	VI	4.34
	Overall	**100**	**89.34**		**83.19**		**6.15**

*Significant difference

Table1 also reveals that the knowledge of beneficiary farmers regarding different improved soybean production technologies was higher than non- beneficiaries ranging from 1.00 MPS in time of sowing to 13.11 MPS in weed management. The significant difference between both the categories of respondents was found in knowledge of weed management (MPS 13.11) followed by soil treatment (MPS 12.58) and plant protection measures (MPS 11.58). The overall difference in knowledge level of beneficiary and non beneficiary farmers was only 6.15 MPS which was non- significant. The findings are in line with the findings of Asiwal et. al. (2008) and Kumawat (2008) who also reported that the average knowledge level of beneficiary was higher than the non-beneficiary. This might be due the fact that there were number of other extension education programmes which are working on the principle "learning by doing" and "seeing is believing" organised by different organisations and communication media used by farmers for providing knowledge about soybean production technology to them, resulting in increase of knowledge not only to beneficiary but non beneficiary farmers also.

Extent of adoption level of the respondents about soybean production technologies: The extent of adoption level by beneficiary and non-beneficiary farmers was measured for all eleven practices of soybean production technologies. Table 2 reveals that the beneficiary respondents adopted time of sowing on their farm at the highest extent with MPS 90.33 followed by field preparation, irrigation management, high yielding varieties and fertilizer management with MPS 87.60, 87.20, 87.07 and 82.00, respectively. The study further shows that MPS pertaining to practices like harvesting & storage, weed management, seed treatment were 80.00, 78.22 and 76.57 respectively, which shows high adoption of these practices by the beneficiary farmers. On the contrary, the practices such as plant protection measures, seed rate & spacing and soil treatment were adopted least by the beneficiary farmers with 74.21, 73.71 and 60.00 MPS, respectively.

The extent of adoption by non- beneficiary farmers was also measured. The data of Table 2 depict that they had adopted time of sowing to the highest extent with MPS 87.67 followed by irrigation management (MPS 83.20) and field preparation (MPS 80.80). The study also indicates that the practices like high yielding variety, fertilizer management and harvesting & storage were adopted to the extent of 78.40, 74.14 and 74.00 MPS, respectively. The plant protection measures, weed management, seed

treatment, seed rate & spacing and soil treatment were found to be least adopted by non- beneficiary farmers with 58.77, 57.33, 56.86, 54.86 and 45.14 MPS, respectively.

Table 2. Extent of adoption level of the respondents about soybean production technologies.

S.N	Soybean production technology	Max. Score	Beneficiary (n=50)		Non- Beneficiary (n=50)		Difference
			MPS	Rank	MPS	Rank	
1	High Yielding Variety	15	87.07	IV	78.40	IV	8.67
2	Field Preparation	05	87.60	II	80.80	III	6.80
3	Soil Treatment	07	60.00	XI	45.14	XI	14.86*
4	Seed Treatment	07	76.57	VIII	56.86	IX	19.71*
5	Time of Sowing	06	90.33	I	87.67	I	2.66
6	Seed Rate & Spacing	07	73.71	X	54.86	X	18.85*
7	Fertilizer Management	14	82.00	V	74.14	V	7.86
8	Irrigation Management	05	87.20	III	83.20	II	4.00
9	Weed Management	09	78.22	VII	57.33	VIII	20.89*
10	Plant Protection Measures	19	74.21	IX	58.77	VII	15.44*
11	Harvesting & Storage	06	80.00	VI	74.00	VI	6.00
	Overall	**100**	**79.72**		**68.28**		**11.44***

*Significant difference

The difference in extent of adoption of various aspects of soybean production technologies between beneficiary and non- beneficiary farmers indicates that difference in extent of adoption level between both the categories of respondents ranged from MPS 2.66 to 20.89. The highest and significant difference between both the categories of respondents was observed in adoption of weed management with MPS 20.89 followed by seed treatment, seed rate & spacing, plant protection measures and soil treatment and with MPS 19.71, 18.85, 15.44, and 14.86, respectively. The overall difference in extent of adoption level between both the categories of respondents was MPS 11.44 which was considered as significant. It is clear that adoption of soybean production technologies was more among the beneficiary as compared to non-beneficiary farmers. It might be due to the fact that continuous contact of beneficiary farmers with scientists during conducting FLDs at their farm has motivated them to acquire knowledge and skills for adopting soybean production technologies for maximise their yield and income. The findings of this study are in conformity with Kumawat (2008) who reported the higher adoption level among the demonstrator as compared to non-demonstrator farmers. Similar finding was also reported by Patel,et.al.(2009) that adoption of improved mustard production technologies under real farm conditions through frontline demonstrations had resulted in significant improvement in the extent of adoption, productivity and profitability of mustard.

Constraints faced by the farmers towards adoption of soybean production technologies: The constraints in adoption of soybean production technologies perceived by the respondents were also measured. Table 3 depicts that the beneficiary farmers expressed high infestation of insect-pest and diseases with MPS 87.33 and assigned first rank in constraint hierarchy followed by high weed competition to the crops (MPS 82.00), unavailability of labour due to MNREGA programme (MPS 76.67), unavailability of disease and insect-pest resistance variety (MPS 66.00), lack of skills for application of insecticide and other chemicals (MPS 51.33) and assigned 2nd, 3rd, 4th and 5th rank, respectively. The other important constraints perceived by the beneficiary farmers were high cost of inputs like seed, fertilizer, insecticide and other chemicals (MPS 42.67), unavailability of high yielding variety (MPS 35.33), and lack of knowledge & skills of soybean production technologies (MPS 32.00) which were assigned 6th, 7th and 8th rank, respectively in problem hierarchy. In-case of non- beneficiary farmers, the high infestation of insect-pest and diseases with MPS 92.67 was assigned first rank in constraint hierarchy followed by high weed

competition to the crops (MPS 83.33), unavailability of labour due to MNREGA programme (MPS 75.33), lack of skills for application of insecticide and other chemicals (MPS 67.33), unavailability of disease and insect-pest resistance variety (MPS 52.00) and assigned 2nd, 3rd, 4th and 5th rank, respectively. The other important constraints perceived by the beneficiary farmers were unavailability of high yielding variety (MP 46.67), high cost of inputs like seed, fertilizer, insecticide and other chemicals (MPS 44.00), and lack of knowledge & skills of soybean production technologies (MPS 38.00) which were assigned 6th, 7th and 8th rank, respectively in problem hierarchy.

Table 3. Constraints faced by the respondents towards adoption of soybean production technologies.

S.N	Constraints	Beneficiaries (n=50)		Non- Beneficiaries (n=50)	
		MPS	Rank	MPS	Rank
1	Lack of knowledge and skills of soybean production technologies	32.00	VIII	38.00	VIII
2	Unavailability of high yielding variety	35.33	VII	46.67	VI
3	Unavailability of disease and insect-pest resistance variety	66.00	IV	52.00	V
4	High infestation of insect-pest and diseases	87.33	I	92.67	I
5	High weed competition to the crop	82.00	II	83.33	II
6	Lack of skills for application of insecticide and other chemicals	51.33	V	67.33	IV
7	High cost of inputs like seed, fertilizer, insecticide and other chemicals	42.67	VI	44.00	VII
8	Unavailability of labour due to MNREGA programme	76.67	III	75.33	III

CONCLUSION

The study revealed that the level of knowledge of beneficiary farmers regarding different improved soybean production technologies was higher than non-beneficiary farmers ranging from 1.00 MPS in time of sowing to 13.11 MPS of weed management. The overall non- significant difference was found in knowledge level of beneficiary and non beneficiary farmers. The difference in extent of adoption level between beneficiary and non-beneficiary farmers was ranged from MPS 2.66 to 20.89. The highest and significant difference was observed in adoption of weed management (MPS 20.89) followed by seed treatment (MPS 19.71), seed rate & spacing (MPS 18.85), plant protection measures (MPS 15.44), and soil treatment (MPS 14.86), respectively. The overall difference in extent of adoption level between beneficiary and non-beneficiary respondents was MPS 11.44 which was considered as significant. The study also revealed that high infestation of insect-pest and diseases, high weed competition to the crops, unavailability of labour due to MNREGA programme, unavailability of disease and insect-pest resistance variety, Lack of skills for application of insecticide and other chemicals, high cost of inputs like seed, fertilizer, insecticide and other chemicals, unavailability of high yielding variety and lack of knowledge & skills of soybean production technologies were important constraints in adoption of soybean production technology as perceived by both category of the respondents.

It can be concluded that frontline demonstration conducted under the close supervision of scientists is one of the important tool for extension to demonstrate newly released crop production and protection technologies and its management practices in the farmer's field under different agro-climatic regions and farming situations. FLDs are playing important role in motivating the farmers for adoption of improved agriculture technology resulting in increasing their yield and profits.

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