Original Research Article

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Performance of FLD Intervention on Yield of Sunflower (*Helianthus annus* L.) in Bihar, India

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ABSTRACT

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The study was carried out to assess the performance of FLD under AICRP on Sunflower in different districts of Bihar. FLD on Sunflower were conducted from Rabi /spring season in the year 2012, 2013, 2014, 2015, and 2016 at various locations of farmers' field. During this period 94 demonstrations were organized of one acre each using hybrid and composite varieties i.e. DRS- 1, KBSH-41, KBSH-44 KBSH-53. Result of the study indicated that in the case of improved demonstrated technology of Sunflower resulted in higher yield i.e., 15.77 q/ha where as in the case of farmers field practice the highest yield recorded was 12.49 q/ha. From the study it is clear that 25.06 percentages increase the sunflower yield over the farmers practice yield to improved technological practice yield. From the study it can be also concluded that sunflower varieties and technology in FLD gave promising results in terms of yield gap and technology index. Looking to the better performance of FLD, famers of the Bihar state were satisfied with sunflower varieties.

Introduction

Sunflower (*Helianthus annus* L.) is one of the most important oilseed crops in India and it ranks third after soybean and groundnut as a source of edible oil. It holds great promises as an edible oilseed crop because of its short duration, photo insensitivity, higher yield potential and wide adoptability to different agro-climatic regions and soil types.

It is a versatile crop which can be grown in any season of the year and it is rich in polyunsaturated fatty acid (PUFA) as well as high vitamin E content. In India, sunflower is

cultivated over an area of about 0.73 million hectares with a production of 0.53 million tonnes and productivity of 712 kg per hectare (Directorate of Economics and Statistics, Ministry of Agriculture and cooperation, government of India, 2012-2013).

The cultivation of sunflower is largely confined to southern parts of the country comprising the states of Karnataka, Maharashtra, Tamil Nadu and Andhra Pradesh. Karnataka is the leading sunflower producing state. However, recently sunflower has moved to northern parts of the country where the productivity is very high. In Bihar,

sunflower is cultivated over an area of about 0.31 million hectare with a production of 0.22 million tonnes and productivity of 1402 kg per hectare (Nayak *et al.*, 2013). This requires a momentum through varietal and technological development, transfer and dissemination of improved technology to the grass root level. Therefore, an attempt has been made to ascertain the performance of FLD intervention on yield of sunflower in Bihar.

Materials and Methods

The frontline demonstrations were conducted in Nalanda, Muzaffarpur, Vaishali and Samastipur district of Bihar. FLD on hybrid and composite variety of Sunflower were conducted by AICRP, Dholi centre from Rabi /spring 2012 to 2016 at various farmers field. During this period 94 FLD's were conducted using hybrid and composite varieties i.e., DRS- 1, KBSH-41, KBSH-44 KBSH-53. Well before conduct of demonstrations, training to the farmers of respective villages was imparted with respect to envisaged technological interventions. All other steps like site and farmer's selection, layout of demonstration and farmers participation etc. were followed as suggested by (Choudhary 1999). To estimate the Technological Gap, Extension Gap and the Technological Index the following formulae have been used (Samui *et al.*, 2000).

Technology gap = Potential yield - Demonstration yield

Extension gap = Demonstration yield - Farmers yield

Potential yield - Demonstration yield
Technology index = ----- X 100
Potential yield

Results and Discussion

The results of the study as well relevant discussion have summarized under the following heads:

Performance of front line demonstration

A comparison of productivity levels between improved technology and farmers practice yield is shown in Table 1. During the period under study it was observed that front line demonstrations on improved technological practice of Sunflower varieties i.e., DRSH- 1, KBSH-41, KBSH-44 KBSH-53 recorded average total grain yield (15.77q/ha) and the percent increase in yield was 25.06 percent higher over the farmers practice yield (12.49q/ha).

In the case of improved technological practice, satisfactory growth i.e. 30.81% increase in yield of Sunflower was observed during the years 2016. During the year 2013, variety KBSH-53 recorded lowest percent (18.59) increase in grain yield.

Among the varieties DRSH-1 was found superior and the KBSH-41, KBSH-44 KBSH-53 yield increase was by, 30.81, 26.49, 24.93, and 24.47 percent respectively. Similar yield enhancement in different crops in front line demonstration has amply been documented by Mishra *et al.*, (2009) and Dhaka *et al.*, (2010).

Yield of front line demonstration trials and Farmers practice of the crop was compared to estimate the yield gaps, which were further categorised into technology index.

Highest technological gap (7.52%) was observed in the variety KBSH-53. The observed technology gap may be attributed to dissimilarities in soil fertility, salinity and erratic rain fall and other vagaries of weather conditions in the area.

Table.1 Mean Performance of improved technology and farmers' practice of Sunflower at different location of Bihar

Sl. No.	Year	No. of Demonstration	Area in Acre	Varieties	Yield (q /ha.)			% increase in Yield
					IT	FP	State Productivity (q/ha)	
1.	2012	15	15	KBSH-44	13.73	10.99	14.25	24.93
2.	2013	30	15	KBSH-53	14.48	12.21	14.29	18.59
3.	2014	13	13	KBSH-41	17.67	13.97	14.29	26.49
4.	2015	16	15.5	DRSH-1	17.60	13.54	14.14	24.47
5.	2016	20	20	DRSH-1	15.37	11.75	14.20	30.81
Total:-		94			15.77	12.49	14.23	25.06

IT= Improved Technology

FP = Farmers Practice

Table.2 Productivity, yield gap and technology index of sunflower

Sl. No	Varieties	Years	No. of Demonstration	Yield (q/ha.)			Gap		Technology index
				Potential	Demonstration	Farmers Yield	Technology	Extension	
1.	KBSH-44	2012	15	18.00	13.73	10.99	4.27	2.74	23.72
2.	KBSH-53	2013	30	22.00	14.48	12.21	7.52	2.27	34.18
3.	KBSH-41	2014	13	20.00	17.67	13.97	2.33	3.70	11.65
4.	DRSH-1	2015	16	22.00	17.60	13.54	4.40	4.06	20.00
5.	DRSH-1	2016	20	22.00	15.37	11.75	6.63	3.62	30.14

The highest extension gap was found in the variety DRSH-1, which was followed by KBSH-41 and KBSH-44, which emphasised the need to educate the farmers through various means for the adoption of high yielding sunflower varieties and among agro technologies to reverse this trend of extension gap. More and more use of new sunflower hybrids varieties by the farmers will subsequently change this alarming trend of galloping extension gap. The lower the value of technology index more is the feasibility.

Table 2 also revealed that the technology index was lowest in the variety KBSH-41. The findings of present study are in line with the findings of Sawardekar *et al.*, (2003), Hiremath and Nagraju (2009). Farmers were motivated by results of improved varieties

and agro technologies applied in the FLDS trials and it is expected that they would adopt these technologies in the coming years.

The Front Line Demonstrations (FLDs) enhanced the yield of crops vertically and ensured rapid spread of technologies horizontally. The FLDs made positive and significant impact on yield enhancement of sunflower by 25.06 per cent. It was found FLD is proven extension intervention to demonstrate the production potential of sunflower crop on farmer's field. Therefore, it is recommended that stakeholders who are engaged in transfer and application of agriculture technologies on farmer's field should give priority to organize Front Line Demonstrations (FLDs) extensively in cluster approach for enhancing productivity potential

of main crops and to make rapid spread of flagship technologies. Most of the low yielding local varieties are replaced due to FLDs. Therefore, it is suggested that policy maker may provide adequate financial support to frontline extension system for organizing FLDs under close supervision of agricultural scientists and extension personnel. This may help to raise the agricultural productivity at district, state and national level.

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