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Impact of FLD Intervention on Yield, Adoption and Horizontal Spread of Oilseed Crops in Konkan

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ABSTRACT

Frontline demonstrations were conducted in Lanja and Rajapur Taluka of Ratnagiri district during 2008 to 2012. Total 93 farmers from two villages namely Asage and Gawane for Groundnut and 26 farmers from Gawane village as poor crop demonstration were selected. The demonstrations were laid out on farmer's field according to recommended package of practices of Dr Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli. The farmers practice was considered as control plot in demonstration cluster. The results revealed that significant raise in yield of groundnut over the control by 60.15 per cent, 53.23 per cent, 47.00 per cent, 46.00 per cent and 74.00 per cent for the year 2007-08, 2008-09, 2009, 2009-10 and 2012, respectively. The yield of Niger was 2.75 q/ha in the year 2008-09 which was increased to 3.11 q/ha in the year 2009-10. The overall adoption level of groundnut production technology and Niger were increased by 181.72 per cent and 233.38 per cent respectevely, due to FLDs. The varieties of groundnut such as SB-11 and local were replaced by Konkan Tapora and Konkan Gaurav, and local variety of Niger was replaced by IGP 76 & Phule Karala in demonstration cluster.

KeywWords: Adoption, horizontal spread, varietal replacement, yield,

INTRODUCTION

The Indian Council of Agricultural Research (ICAR) has established Krishi Vigyan Kendras (KVKs) all over the country for transferring agricultural technology on the farmer's field with the help of a multi-disciplinary team called Subject Matter Specialists (SMS). KVKs are playing strategic role in technology backstopping, knowledge management and advisory to the different stakeholders like farmers, farm-women, rural youths and extension personnel. The emphasis is given to provide critical knowledge and skills to the participants to enhance the agricultural productivity and also become economically self-reliant through gainful-employment. The mandate of KVK is to plan and carry out on-farm research trials to verify, test, validate and refine location-specific technologies developed by the National Agricultural Research System (NARS). The main purpose is to have an appropriate technology which may be economically profitable, ecologically sustainable, technically feasible and culturally compatible. Another important activity of KVK is to demonstrate the flagship technologies developed by NARS on farmer's field to enhance productivity and profitability of principle crops grown in the district. Therefore, KVK should know that to what extent the productivity of these crops are in round due to demonstrations, to what extent demonstrations helped for horizontal spread of technologies in their operational area and extent to what the new technologies are adopted by the farmers. With this background, present study was undertaken to assess the impact of Font Line Demonstration (FLDs) organized by KVK, Lanja. Study Was conducted with the objective to study the impact of Front Line Demonstrations (FLDs) on yield enhancement of oilseed crops, impact of Front Line Demonstrations (FLDs) on adoption of technology and the extent of horizontal spread of oilseed technology through FLDs.

METHODOLOGY

The frontline demonstrations were conducted in Lanja and Rajapur Taluka of Ratnagiri district during 2008 to 2012. Total, 93 farmers from two villages namely Asage and Gawane for Groundnut and 26 farmers from Gawane village of dapoli district, Maharashtra for Niger crop demonstration were selected. The demonstrations were laid out on farmers' field according to recommended' package of practices of Dr Balasaheb

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Sawant Konkan Krishi Vidyapeeth, Dapoli. The farmer practice was considered as control plot in demonstration cluster. All critical inputs *viz.,* seed, fertilizer, IPM and bio-fertilizers were supplied to the farmers. The demonstration plot was supervised by the KVK scientists. The data of FLD was collected by KVK scientists and used to assess the impact on yield. However, data about adoption and horizontal spread of technologies were collected from the farmers with help of interview schedule. Data were subjected to suitable statistical methods. The following formulae were used to assess the impact on different parameters of oilseed crops.

$$\text{Impact on Yield (\% Change)} = \frac{\text{Yield of Demonstrated Plot - Yield of Control Plot}}{\text{Yield of Control Plot}} \times 100$$

$$\text{Impact on Adoption (\% Change)} = \frac{\text{No. of Adopters before Demonstration - No. of Adopters after Demonstration}}{\text{No. of Adopters after Demonstration}} \times 100$$

$$\text{Impact on Horizontal spread (\% Change)} = \frac{\text{Before area (ha)} - \text{After area (ha)}}{\text{After area (ha)}} \times 100$$

RESULTS AND DISCUSSION

Impact of front line demonstrations (FLDs) on yield

The findings of impact of Front Line Demonstrations (FLDs) on yield enhancement of different crops are presented hereunder. It is evident from Table 1 that the pod yield of demonstration plot of groundnut was 22.70 q/ha (2007-08), 21.30 q/ha (2008-09), 19.51 q/ha (2009-10), 23.17 q/ha (2009-10) and 16.20 q/ha in 2012. This showed that there was significant raise in yield of groundnut over the control by 60.15 per cent, 53.23 per cent, 47.00, 46.00 and 74.00 per cent for the year 2007-08, 2008-09, 2009, 2009-10 and 2012, respectively. Similar trend of FLD was reported by Mishra *et. al.*(2009) on potato crop.

Table 1: Impact of Front Line Demonstrations (FLDs) on Yield of Groundnut Crop

Crop	Year	Technology Interventions	Number of Farmers	Demonstrated Area (Ha)	Average Yield (q/ha)		Impact (% Change)
					Control Plot	Demonstration Plot	
Groundnut	*Rabi*-2007-08	TG-26 Variety +Seed treatment+Rhizobium, PSB & Trochoderma+ Earthling up operation after one month	25	10.00	14.04	22.70	+**61.00**
	Kharif-2008	TG-26 Variety +Seed treatment+Rhizobium, PSB & Trochoderma+ Earthling up operation after one month	13	5.00	13.90	21.30	+ **53.00**
	Kharif-2009	Konkan Gaurav Variety +Seed treatment+Rhizobium, PSB & Trochoderma before sowing	20	7.00	13.24	19.51	+ **47.00**
	Rabi-2009-10	Konkan Gaurav Variety +Seed treatment+Rhizobium, PSB & Trochoderma before sowing	25	10.00	15.81	23.17	+ **46.00**
	Kharif-2012	Konkan Trombay Tapora + Seed treatment+Rhizobium, PSB & Troch oderma before sowing	10	2.50	9.26	16.20	+ **74.00**
		TOTAL	**93**	**34.50**	**13.25**	**20.57**	+ **56.20**

Similar trend was observed in case of Niger crop. Table 2 revealed that the yield of demonstration plot of Niger was 2.75 q/ha in the year 2008-09 and 3.11 q/ha in the year 2009-10. There was significant increase in yield of Niger by 52.00 per cent and 43.00 per cent for the year 2008-09 and 2009-10, respectively. This showed the positive impact of FLD of Niger crop. Yield enhancement in different crops in Front Line Demonstration was showed by Haque (2000), Tiwari and Saxena (2001), Tiwari *et al.* (2003) and Tomer *et al.* (2003) Naberia, *et al.,* (2015).

Table 2: Impact of Front Line Demonstrations (FLDs) on Yield of Niger Crop

Crop	Year	Technology Interventions	Number of Farmers	Demonstrated Area (Ha)	Mean/Average Yield (q/ha)		Impact (% Change)
					Control Plot	Demonstration Plot	
Niger	*Kharif*-2008	IGP 76 varierty + seed treatment of fungicide	13	5.00	1.80	2.75	**+52.00**
	Kharif-2009	Phule Karla varierty	13	5.00	2.17	3.11	**+43.00**
		TOTAL	**26**	**10.00**	**1.98**	**2.93**	**+47.50**

The yield level of control plot was threatened due to low yielding local varieties, improper fertilizers and improper plant population measures. However, in case of demonstration plot, the factors led to enhance the yield of crop were timely sowing, use of recommended varieties, balanced nutrient management and strong technology backstopping from KVK scientists.

Impact of front line demonstrations (FLDs) on adoption of groundnut production technology by the farmers is depicted in table 3.

Table 3: Impact of Front Line Demonstrations (FLDs) on Adoption of Groundnut Production Technology

Technology	Number of Adopters (N=93)		Change in No. of Adopter	Impact (% Change)
	Before Demonstration	After Demonstration		
Land preparation and application of FYM	75	93	+ 18	24.00
Recommended Varieties (Konkan Gaurav, Konkan Tapora, TG-26)	13	87	+ 74	569.23
Seed rate (100-120 Kg/ha)	34	66	+ 32	94.12
Seed treatment + Rhizobium, PSB & *Trochoderma*	19	71	+ 52	273.68
Sowing time and spacing (30×15 cm)	67	81	+ 14	20.90
Fertilizer management (25:50:00)	44	91	+ 47	106.82
Weed management	69	93	+ 24	34.78
Earthling up operation 30 DAS	20	51	+ 31	155.00
Drum rolling dur ing peg formation stage	11	58	+ 47	336.36
Recommended yield	24	71	+ 47	195.83
Overall Impact				**181.72**

It was found that adoption of recommended varieties of groundnut by the farmers was less before demonstration period which was increased by 569.23 per cent after demonstration. This was followed by adoption of important operation of groundnut *i.e.* drum rolling during peg formation stage which was increased significantly by 336.36 per cent. Seed treatment with Thirum, Rhizobium, PSB & Trochoderma was increased by 273.68 per cent due to FLD. In addition, the percent of adopters of recommended technologies such as seed rate, fertilizer management, weed management, earthling up operation (30 DAS) and land preparation and application of FYM were increased significantly. The overall adoption level of groundnut production technology was increased by 181.72 per cent due to FLDs organized by KVK, Lanja. Same findings in case of jute crop were recorded by Chapke (2010).

Table 4: Impact of Front Line Demonstrations (FLDs) on Adoption of Niger Production Technology

Technology	Number of Adopters (N=26)		Change in No. of Adopter	Impact (% Change)
	Before Demonstration	After Demonstration		
Land preparation and application of FYM	4	11	+7	175.00
Recommended Varieties (IGP 76, Phule Karla)	00	11	+11	1100
Seed rate (3-4Kg/ha)	5	9	+4	80.00
Seed treatment	00	4	+4	400
Sowing time	8	10	+2	25.00
Spacing (30 cm)	7	11	+4	57.14
Fertilizer management	6	9	+3	50.00
Weed management	3	7	+4	133.34
Recommended yield	5	9	+4	80.00
Overall Impact				**233.38**

Impact of front line demonstrations (FLDs) on varietal replacement

The FLDs are proven extension intervention for making change in existing/traditional practice of farmers. Therefore, efforts were taken to know if the varietal replacement happened due to FLD in selected cluster. It was found that the varieties of groundnut such as SB-11 and local were replaced by Konkan Tapora and Konkan Gaurav on large scale. The local variety of Niger was replaced by IGP 76 & Phule Karala in demonstration cluster. Replacement of local varieties with improved

varieties of maize, paddy and wheat due to FLD was reported by Balai *et. al.* (2013).

Impact of front line demonstrations (FLDs) on horizontal spread of variety

In present study, efforts were taken to study the impact of FLDs on horizontal spread of varieties of various crops.

Table 5: Impact of Front Line Demonstrations (FLDs) on Varietal Replacement of Different Crops

Crop	Previous grown variety	New variety introduced
Groundnut	SB-11, Local	Konkan Trombey Tapora, Konkan Gaurav, TG-26
Niger	Local	IGP 76 & Phule Karala

Table 6 indicated that FLD organized on various crops helped to increase their area under recommended varieties. There was significant increase in area horizontally from 1.00 ha to 7.60 ha under Konkan Tapora variety of groundnut and from 2.00 ha to 9.00 ha under Konkan Gaurav due to FLD. Similarly, area under Niger crop was increased from 0.40 ha to 2.00 ha due to FLD. The FLDs made positive impact on horizantal spread of varieties of groundnut and niger crop. Therefore, study conclude that FLDs organized by KVK, Lanja made significant impact on horizantal spread of technlogies.

Table 6: Impact of Front Line Demonstrations (FLDs) on Horizontal Spread of Variety of Different Crops

Crop	Area (Ha)		Change in Area (Ha)	Impact (% Change)
	Before Demonstration	After Demonstration		
Groundnut				
Konkan Tapora	1.00	7.60	+6.60	660.00
Konkan Gaurav	2.00	9.00	+7.00	350.00
TG 26	4.00	6.00	+2.00	50.00
Niger				
IGP 76	0.40	2.00	+1.60	400.00

CONCLUSIONS

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 Groundnut by 56.20 per cent and Niger by 47.50 per cent. Impact of FLDs on adoption of technologies showed increased trend in adoption of groundnut production technologies by 181.72 per cent and Niger production technologies by 233.38 per cent. FLDs made positive impact adoption of improved varieties, earthling up & drum rolling operation of groundnut and adoption of recom-mended varieties of Niger. Further, SB-11 and local variety of groundnut were replaced by Konkan Tapora, Konkan Gaurav and TG-26 on large scale in demonstration cluster. FLDs organized by KVK, Lanja made significant impact on horizantal spread of technologies. The area under Konkan Tapora variety of groundnut was increased from 1.00 ha to 7.60 ha and Konkan Gaurav 2.00 ha to 9.00 ha.

It was found FLD is proven extension intervention to demonstrate the production potential of different crops 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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