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Impact of front line demonstration on yield sorghum

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Abstract

The study on sorghum growers within Front line demonstration was conducted in Banwas village taluka Palam District Parbhani of Maharashtra state by Sorghum Research Station, VNMKV, Parbhani during 2019-20. The number of respondents selected for the study was 100. The data was collected by personal interview method and by Demonstration of Improved Sorghum technology. Yield attributes of both demonstrations and farmers practices were recorded and percent yield enhancement, technology gap, extension gap, technology index, were analyzed. The average two season data revealed that average grain yield of demonstration plots was obtained in *Kharif* season was yield 1065 kg ha⁻¹ over the local check 634kg ha⁻¹ & fodder yield 2458 kg ha⁻¹ over the local check 1400 kg ha⁻¹ and in *rabi* season grain yield was 958.5kg ha⁻¹ over the local check 662.5 kg ha⁻¹ & fodder yield 2395.5 kg ha⁻¹ over the local check 1589.5 kg ha⁻¹. There is an increase in average grain yield by 67.5 per cent & fodder yield by 75% in *Kharif* whereas, in *rabi* increase in average grain yield by 41 per cent & fodder yield 51% The study suggests to the strengthening linkages with line department and converging the demonstration with Government schemes for large scale adoption of farmers' fields. FLD can be a good option for enhancing farmers' income.

Keywords: Front line demonstration, technology gap, extension gap, technology index

Introduction

Sorghum (*Sorghum bicolor* L. Moench) is the fourth largest crop after wheat, rice and maize which is being cultivated by resource poor, small and marginal farmers in semi-arid regions of the country. Sorghum is one of important crop not only for food but also fodder for animal feed and fuel too in both the season *kharif* and *rabi*. From last few decades sorghum crop negated by farmers area of gradually decrease in *kharif* than *rabi* because farmers using local cultivar, lack of knowledge of improved technology and low MSP. Now a day's change in climate and health conscious increase demand of sorghum crop to meet requirement of food, fodder, feed and fuel Frontline demonstrations (FLDs) programme is one of the way for extension of farm technologies generated by research on farmers field.

Every year IIMR Hyderabad under AICRP allots front line demonstration for increasing awareness among rural farmer and increase their standard of living. Under this project for the year 2019-20, SRS, VNMKV, Parbhani selected a Banwas village of Palam tq Parbhani district of Maharashtra state and distributed improved variety seeds, package of practices and Conducted different activity such as Farmers rally, Kisan mela, demonstration and different scientist guideline for farmer in aspect of improve sorghum production and socio-economic condition of farmers.

Methodology

The study was carried out by Sorghum Research Station, VNMKV, Parbhani for year 2019-20 at farmer's fields of Banwas village of Parbhani district. In total 100 FLDs in 40 ha (50 FLD's in *kharif* & 50 FLD's in *rabi*) area in different locations were conducted. The differences between the demonstration package and existing farmer's practices are mentioned in Table-1 and detailed of no of FLD in Table-2. All demonstrations were conducted under the supervision of Sorghum Research Station, VNMKV, Parbhani scientists.

In *Kharif* 50 FLD (20 ha) demonstration plots, use of quality's seed of improved varieties (Parbhani shakti and SPH-1705), line sowing, seed treatment and timely weed control, as well as recommended dose of fertilizer (80 kg nitrogen+ 40 kg phosphorus) were emphasized. In case of farmer's practices, existing practices used by farmers were followed.

In *Rabi* 50 FLD (20 ha) demonstration plots, use of quality's seed of improved varieties (Parbhani super moti) and moisture conservation practice (P.Moti & P.Jyoti) along with line

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sowing, seed treatment and timely weed control, as well as recommended dose of fertilizer (40 kg nitrogen+ 20 kg phosphorus) were emphasized.

In case of farmer's practices, existing practices used by farmers were followed. Before conducting the demonstration, training to the framers of respective villages was imparted with respect to envisaged technology interventions, site selection, farmer's selection, lay out of demonstration, and farmer's participation etc were followed as suggested by Choudhary (1999) [2] and Singh *et al.* (2011) [8]. Visits of scientists and the extension functionaries were organized at demonstration plots to disseminate the message at large. The data on output of sorghum crop were collected from FLD plots as well as control plots and finally the yield attributes, seed yield, cost of cultivation, net returns with the benefit cost ration were worked out. The collected data was tabulated and analyzed by using statistical tools like frequency and percentage. To estimate the extension gap, technology gap and technology index following formulae was considered as suggested by Samui *et al.* (2010), Kadian, *et al.* (2004) [3] and Sagar and Chandra (2004).

Technology gap = Pi (Potential yield) – Di (Demonstration yield)

Extension gap = Di (Demonstration yield) – Fi (Farmers yield)

$$\text{Technology index} = \frac{\text{Potential yield} - \text{Demonstrated yield}}{\text{Potential yield}} \times 100$$

Additional return= Demonstration return – farmer's practice return

$$\text{Percent increase yield} = \frac{\text{Demonstration yield} - \text{farmers yield}}{\text{Farmers yield}} \times 100$$

Client Satisfaction Index (CSI) was calculated by using formula as developed by Kumaran and Vijayaragavan (2005) [4].

$$\text{Client Satisfaction Index (CSI)} = \frac{\text{Individual obtained score}}{\text{Maximum score possible}} \times 100$$

Selection of the farmers: Farmers from the different categories including SC and ST, who are interested, cooperative and responsive, were selected.

Field layout: The field layout should be included farmer's practice. The component demonstration and total package demonstration need to be conducted separately. The field for FLD should be minimum of 0.4 ha.

Technology dissemination: Conducted different extension activity like, farmers' day, field days and field visits and explain superiority of the demonstrated technologies over their own practices involving maximum number of farmers of the village and surrounding areas.

Table 1: Improved package of practice Vs Local package of practice for *Kharif & Rabi-2019-20*

Sr. No.	Particulars	Improved package of practice – <i>Kharif 2019-20</i>	Improved package of practice- <i>Rabi2019-20</i>	Local package of practice	Gap
1	Variety	Parbhani shakti-Bio-fortified & SPH-1705	Parbhani Supermoti, P.Moti & P.Jyoti	Local variety	Full gap
2	Seed rate	7.5-10 kg/ha	7.5-10 kg/ha	10-12 kg/ha	Full gap
3	Land preparation	In-situ moisture conservation operation by Baliram Plough & 3 hoeing are major considerations for promote soil aeration, water retention in root zone and availability of water to the crop	1. Ploughing & land preparation 2. Ridges & Furrow- <i>In situ</i> moisture conservation operation	Not Follow	Full gap
4	Time of sowing	First week of June to first week of July	First week of Oct to Nov.	<i>Kharif</i> - First week of June to first week of July <i>Rabi</i> - Oct to Nov	No gap
5	Seed treatment	Imidacloprid 48% FS	Imidacloprid 48% FS	Not followed	Full gap
6	Spacing	45x15cm	45x15cm	Not maintained broad casting	Full gap
	RDF	NPK: 80:40:40 kg/ha, half nitrogen, full phosphorus and full potassium applied as basal and remaing half nitrogen 30 DAS.	NPK: 40:20:20 kg/ha, half nitrogen, full phosphorus and full potassium applied as basal and remaing half nitrogen 30 DAS.	Imbalanced use of fertilizer	Partial gap
7	Weed Management	1 hoeing and 1 hand weeding	1 hoeing and 1 hand weeding	Not done	Full gap
8	Plant protection	Use of carbofuron and immetinbenzoate	Use of carbofuron and immetinbenzoate	Not done	Full gap

Table 2: Details of Crops, Variety, Nos. Front Line Demonstrations conducted

Sl. No.	Crop	Variety	Nos. of FLD	Name of villeges	Nos. of Farmers	Area (ha)
<i>Kharif-2019-20</i>						
1	Sorghum	P.Shakti	25	Banwas	25	10
		SPH-1705	25		25	10
<i>Rabi-2019-20</i>						
1	Sorghum	Parbhani Supermoti	25	Banwas	25	10
		Moisture conservation practice	25		25	10
		Total	100		100	40

Results and Discussions

Results of frontline demonstrations indicated that the improved cultivation practices comprised under FLD produced of 67.5 per cent more grain yield & 75% more fodder yield of sorghum crop as compared to farmer's practices in *Kharif* season (Table 3&4). Similar results were found in *rabi* with of 44% more grain yield & 51% more fodder yield of sorghum crop as compared to farmer's practices (Table 5 &6). The similar results of yield enhancement crop production through frontline demonstrations has been documented by and Singh 2016; & Singh and Sharma (2016) [4]. Farmers gain good net returns over farmers practice are showed in graph-1. Similar results were observed by Anil Kumar *et al* (2010) [1] regarding bajara

crops in frontline demonstration in Haryana state. FLD not only help to increase grain yield but also helps to improve the economy of farmer. The results indicated that the front line demonstration has given a good impact on farming community as they were motivated by the new agricultural technology applied in the FLD plots.

The extension gap which ranged average from 200 kg ha⁻¹ to 900 kg ha⁻¹ during the period it emphasized the need to educate the farmers through various means for adoption of improved agricultural practices to reverse this trend of wide extension gap reported by Thakur and Shurya Bhushan (2016) [9]. In this context, FLD are playing an important role in popularizing improved variety and technology.

Table 3: Results of Grain yield demonstrations under FLD *Kharif* 2019-20

Year	Sorghum variety	Grain yield (Kg ha ⁻¹)		Per cent increase over local	Potential of grain yield (Kg ha ⁻¹)	Extension gap (Kg ha ⁻¹)	Technology gap (Kg ha ⁻¹)	Technology index (%)
		IT	LP					
Kharif-2019-20	P.shakti	1070	634	68	3600	436	2530	70
	SPH-1705	1060	634	67	2300	426	1240	53
Average		1065	634	67.5	2950	431	1885	61.5

Table 4: Results of Fodder yield demonstrations under FLD *Kharif* 2019-20

Year	Sorghum variety	Fodder yield (Kg ha ⁻¹)		Per cent increase over local	Potential of grain yield (Kg ha ⁻¹)	Extension gap (Kg ha ⁻¹)	Technology gap (Kg ha ⁻¹)	Technology index (%)
		IT	LP					
Kharif-2019-20	P.shakti	2490	1400	77	10500	1090	8010	76
	SPH-1705	2426	1400	73	10500	1026	8074	67
Average		2458	1400	75	10500	1058	8042	71.5

Table 5: Results of Grain yield demonstrations under FLD *Rabi* 2019-20

Year	Sorghum variety	Average yield (Kg ha ⁻¹)		Per cent increase over local	Potential of grain yield (Kg ha ⁻¹)	Extension gap (Kg ha ⁻¹)	Technology gap (Kg ha ⁻¹)	Technology index (%)
		IT	LP					
Rabi-2019-20	P. Super moti	952	666	42	3200	286	2248	70
	Moisture conservation	965	659	46	2000	306	1035	52
Average		958.5	662.5	44	2600	296	1641.5	61

Table 6: Results of Fodder yield demonstrations under FLD *Rabi* 2019-20

Year	Sorghum variety	Fodder yield (Kg ha ⁻¹)		Per cent increase over local	Potential of grain yield (Kg ha ⁻¹)	Extension gap (Kg ha ⁻¹)	Technology gap (Kg ha ⁻¹)	Technology index (%)
		IT	LP					
Kharif-2019-20	P. Super moti	2380	1664	43	11000	716	8620	79
	Moisture conservation	2411	1515	59	6500	900	4089	63
Average		2395.5	1589.5	51	8750	808	6354.5	71

*IT-Improved technology & LP-Local check/Farmer practice

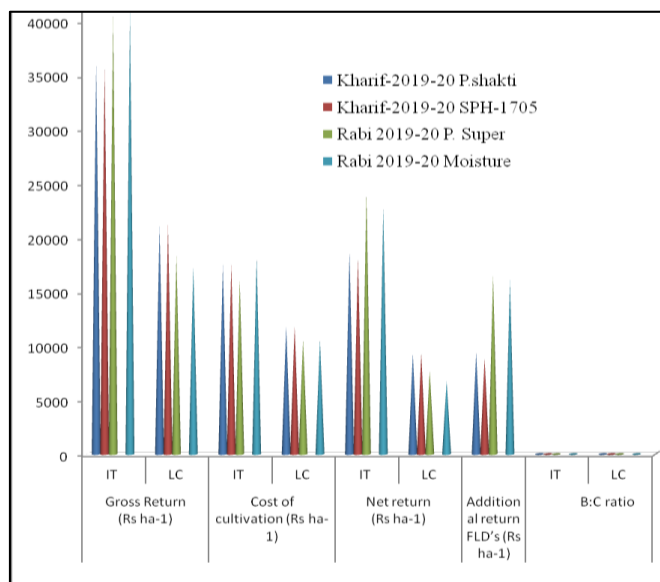


Fig 1: Economic analysis of frontline demonstrations on Sorghum Farmers Satisfaction

The extent of satisfaction level of farmers over extension services and performance of improved practices of sorghum was measured by Client Satisfaction Index (CSI). The results of which are presented in Table 7. It was observed from table 7 that majority of the respondent's expressed high (55%) to medium (33 %) level satisfaction for extension services and performance of improved practices under demonstrations, whereas, only 11 per cent of respondents expressed low level of satisfaction. The medium to higher level of satisfaction with respect to improved cultivation practices of sorghum, linkages with farmers, services rendered etc. indicated stronger conviction, physical and mental involvement in the front line demonstration. It is resulted that FLD had good preference among the farmers. The results are in conformity with the results of Kumaran and Vijayaraghavan (2005) and Tomar (2010) [10].

Table 7: Extent of farmer's satisfaction of extension services rendered

S. No.	Satisfaction	Frequency	Percentage
1	Low	10	11%
2	Medium	30	33%
3	High	50	55%

Constraints in sorghum production

Problems faced by the farmers in sorghum cultivation were documented during the study, Farmer's did not get labour for timely harvesting, less MSP on sorghum, because of labor shortage and less MSP farmer ignore the crop production technology and consider the crop only up to own consumption.

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