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Impact of Front Line Demonstrations on the Yield and Economics of Pulse Crops in Burhanpur District of Madhya Pradesh

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ABSTRACT

The study was carried out in adopted villages of Krishi Vigyan Kendra, Burhanpur during 2013-14 to 2018-19. Total 100 front line demonstrations were conducted on pulses i.e. black gram, soybean, pigeon pea, chickpea and green gram in 40 hectare by the active participation of the farmers for adoption of improved technologies of pulse production potentials. The improved technologies included use of new variety and full package of practices i.e. seed treatment, integrated nutrient management, integrated pest management, irrigation, harvesting, storage and post-harvest management. FLD plot recorded higher yield as compared to farmer's local practice. The mean data revealed that an average yield recorded was 15.74 q/ha under demonstrated plots as compare to farmers practice 12.50 q/ha. Additional yield over local check was 3.04 q/h with percent increased yield of 19.38 per cent. The improved technologies gave higher gross return (Rs 65870/ha), net return (Rs. 46510/ha) with higher benefit cost ratio (3.09) as compare to farmer's practice (2.52).

Keywords: Pulses, FLDs, Technology gap, Extension gap, Technology index and yield

INTRODUCTION

India is the largest producer of pulses in the world, both in quantity and variety. Pulses are the primary source of protein for the poor and the vegetarians who constitute the majority of Indian population. While the traditional cropping pattern almost always included a pulse crop either as a mixed crop or in rotation, the commercialization of agriculture has encouraged the practice of sole-cropping. Pulses contribute 11 per cent of the total intake of proteins in India (Reddy, 2010). In India, frequency of pulses consumption is much higher than any other source of protein, which indicates the importance of pulses in their daily food habits. Keeping the cheapest source of protein, it is important to increase pulses production to increase balanced diet among the socially and economically backward classes. India is the largest producer (25% of global production), consumer (27% of world consumption) and importer (14%) of pulses in the World. Although it is the world's largest pulses producer, India is importing 4-6 million tons (MT) and consumer (26-27 MT) of pulses every year to meet its domestic demand (DAC & FW, GOI 2018-19). India achieved a record 25.23 MT pulses production in 2017-18 with pigeon pea 21.10 per cent, chickpea 40.55 per cent, green gram 9.38 per cent, black gram 12.23 per cent and other pulses 16.77 per cent share in total production (Directorate of Economics and Statistics, DES 2017-18). Pulses are grown across the country with the highest share coming from Madhya Pradesh (23%), Uttar Pradesh (18%), Maharashtra (14%), Rajasthan (11%) and Andhra Pradesh (09%). In Burhanpur district area of pulses is 6.934 (000'ha) with a production of 8.7694 (000' tons) whereas productivity is 1048.40 (kg/ha). Keeping in view the importance of Pulses production technology the present study was conducted to establish the production potential of high yielding varieties of pulses by Technology Gap, Extension Gap, Technology Index and economic

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impact of pulses and comparing the yield level of FLDs plot with non FLD plots.

METHODOLOGY

The study was conducted by KVK, Burhanpur during 2013-14 to 2018-19 in adopted villages (Harda, Nimandar, Manjrod, Umarda, Sandas) of Krishi Vigyan Kendra, a total 100 front line demonstrations on pulses variety in adopted villages of Burhanpur district (Table 1). The component demonstration of front line technology in pulses was comprised of improved variety, proper seed rate, seed treatment, sowing method, nutrient management, proper irrigation, weed management, protection measures, harvesting and post-harvest management. The yield and economic performance of front line demonstrations, the data on output were collected from FLDs as well as local plots and finally the production, cultivation cost, gross return, net returns with the benefit cost ratio was worked out. The FLD was conducted to study the technology gap between the potential yield and demonstrated yield, extension gap between demonstrated yield and yield under existing practice and technology index.

The yield data were collected from both the demonstration and farmers practice by random crop cutting method and analyzed by using simple statistical tools. Site selection and farmers' selection were considered as suggested by Choudhary (1999). The observation on seed yield, straw yield per ha were recorded. Other parameters like harvest index, technology index were worked out as suggested by Kadian *et al.* (1997). The gross return, net return, cost of cultivation and benefit cost ration were also calculated. Training to the farmers of respective villages was imparted before conducting the demonstrations with respect to envisaged technological.

Extension Gap (q/ha) = Demonstration Yield – Check Yield

Technology Gap (q/ha) = Potential Yield – Demonstration Yield

Technology Index (%) = Technology Gap / Potential Yield X 100

RESULTS AND DISCUSSION

Mean data of Table 2 indicated that potential yield of pulse crops was 18.40 q/ha followed by demonstration yield (15.74 q/ha) and farmer's yield (12.50 q/ha) whereas, additional yield over local check was 3.04 q/ha

Table 1: Year wise detail of front line demonstrations on pulses

Year	Crop	Variety	Village	Area (ha)	No. of FLDs
2013-2015	Black gram	JU-86	Harda	08	20
2014-2016	Soybean	RVS 2001-4	Nimandhar	08	20
2015-2017	Pigeon Pea	TJT-501	Manjrod	08	20
2016-2018	Chickpea	JAKI-9218	Umarda	08	20
2017-2019	Green Gram	TJM-3	Sandas	08	20
		Total		**40**	**100**

Table 2: Yield performance of different pulses under demonstration (Pooled data)

Crop	Yield (q/ha)			Additional Yield over local check (q/ha)	Percent Increase Yield over local check (%)
	Potential Yield (PY)	Check Yield (FP)	Demo Yield (RP)		
Black Gram	10.00	06.50	07.80	1.30	20.00
Soybean	25.00	15.00	19.00	4.00	21.05
Pigeon Pea	24.00	20.00	22.00	2.00	10.00
Chickpea	21.00	13.00	19.88	6.88	34.61
Green Gram	12.00	08.99	10.00	1.01	11.23
Mean	**18.40**	**12.50**	**15.74**	**3.04**	**19.38**

and percent increase yield over local check is 19.38 per cent. This result clearly indicated that the higher average grain yield in demonstration plots over the years compared to farmer's practice was achieved due to knowledge and adoption of full package of practices i.e. appropriate variety, sowing time, seed rate, seed treatment, sowing method, spacing, weed management, irrigation practices and need based plant protection techniques. The findings are in similarity with the findings of Singh (2002); Poonia and Pithia (2011); Kumbhare *et al.* (2014); Nain *et al.* (2014); Dhaka *et al.* (2015) and Lal *et al.* (2016).

Mean data of Table 4 reveals that technological gap in pulses crop is 1.01 q/ha, extension gap is 3.04 q/ha. This may be due to the soil fertility, managerial skills of individual farmer's and climatic condition of the area. Hence, location specific recommendations are necessary to bridge these gaps. Technology index is 15.27 per cent which shows the effectiveness of technical interventions. This accelerates the adoption of demonstrated technical interventions to increase the yield performance of pulse crops. Similar findings were reported by Kirar *et al.* (2006); Meena *et al.* (2016) and Singh *et al.* (2014).

Mean data of Table 4 clearly shows Economics of FLD. Cost of cultivation of pulses in demo plot is 19360 Rs/ha and check plot is 17200 Rs/ha, Gross return is 65870 Rs/ha as compare to check plot 47090 Rs/ha, Net return 46510 Rs/ha as compare to check plot 29940 Rs/ha and B:C ratio is 3.09 and of 2.52 of check plot for Front line demonstrations. This may be due to higher yield obtained and lower cost of cultivation under improved technologies compared to local check (farmers practice). This finding is in corroboration with the findings of Mokidue *et al.* (2011); Verma *et al.* (2016) and Raj *et al.* (2013).

CONCLUSION

The study was under taken to ascertain the economics of pulses production technologies. Front line demonstration (FLDs) played a very important role to disseminate recommended technologies resulting in an increased in yield at farmers' level and proved the potential of technology. The result convincingly brought out that the yield of pulses can be increased with the intervention on recommended package of practices. This

Table 3: Technology gap, extension gap and technology index of pulses under FLD

Crop	Technology Gap (q/ha) TG = PY – RP	Extension Gap (q/ha) EG = RP – FP	Technology Index (%) TI = Tech. Gap/PY X 100
Black Gram	2.20	1.30	22.00
Soybean	6.00	4.00	24.00
Pigeon Pea	2.00	2.00	08.33
Chickpea	1.12	6.88	05.33
Green Gram	2.00	1.01	16.67
Mean	**1.01**	**3.04**	**15.27**

Table 4: Economic analysis of the demonstrated plot of pulses under FLDs (Pooled data)

Crop	Cost of Cultivation (Rs/ha)		Gross Return (Rs/ha)		Net Return (Rs/ha)		B : C Ratio	
	FP	RP	FP	RP	FP	RP	FP	RP
Black Gram	11500	12800	22750	27300	11500	14500	1.00	1.13
Soybean	23000	23000	52500	66500	29500	43500	2.29	2.89
Pigeon Pea	18000	22500	70700	106050	52700	83550	3.93	4.71
Chickpea	20000	23500	52000	79500	32000	56000	2.60	3.38
Green Gram	13500	15000	37500	50000	24000	35000	2.78	3.33
Mean	**17200**	**19360**	**47090**	**65870**	**29940**	**46510**	**2.52**	**3.09**

also improved linkages between farmers and scientists, and built confidence for adoption of the improved technology. Productivity enhancement under FLDs over farmer practices of pulses cultivation created a greater awareness, and motivated other farmers not growing pulses to adopt improved technologies. These practices may be popularized in this area by the extension agency to bridge the higher extension gaps.

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