

ROLE OF CLUSTER FRONTLINE DEMONSTRATION FOR BOOSTING THE OILSEEDS PRODUCTION IN RAJASTHAN: A CASE STUDY IN PALI

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ABSTRACT

India is considered as one of the largest producer of grains and oilseeds among the countries of the world. It is also the world's second largest consumer of vegetables' oils. The main oilseed crops grown in India are groundnut, rapeseed, mustard, sesame, sunflower, safflower, niger and soybeans. This study was conducted in Pali district of Rajasthan during the years 2013 to 2016. The productivity of oilseeds crops continues to be quite low due to gaps in adoption of oilseeds technologies. The yield of oilseeds can be increased by demonstrating their cultivation technologies at the farmers' fields under the supervision of scientists working in the operational area. The progress of Front Line Demonstrations on oilseed during the year 2013 and 2014 to 2016 exhibit the performance of recommended high yielding variety i.e. NRCDR 2 of mustard is presented revealed that in the rabi season 2013, 14 demonstrations of mustard covering 3.0 hectare in 2 villages with variety NRCDR 2 and local check were planted. An average yield of 15.1q/ha of test variety was obtained, as compared to 10.7q/ha of local check, where per cent increase was accounted at 31.8 per cent, respectively. During the rabi season 2014, 5 demonstrations of mustard covering 2.0 ha in one village with variety NRCDR 2 and local check were planted. An average yield of 14.8q/ha of test variety was obtained, as compared to 10.4q/ha of local check, where per cent increase was accounted at 29.8 per cent. Keeping the importance of Frontline Demonstrations, the KVK, CAZRI, Pali conducted demonstrations on improved agricultural technologies of oilseeds crops in farmers' fields during the year 2013-14, 2014-15 and 2015-16 and achieved the expected yields.

Keywords: adoption, oilseeds, cluster frontline, demonstration, adoption and TOT

INTRODUCTION

Indian vegetable oil economy is the fourth largest in the world, accounting for about 14.5% of the world's oilseeds area and 6.65% of the production next to USA, China and Brazil. Currently, India accounts for 6.8% of the oil meal production, 5.9% of the oil meal export, 6.1% of the vegetables oil export, 9.00% of the vegetable oil import and 9.3 % of the edible oil consumption of the world (Sonnad *et al.* 2016). Oilseeds play the second important role in the Indian agricultural economy, next only to food grains in terms of area and production. Oilseed crops occupy 13-14 % of gross cropped area and are cultivated in an area of 26.82 million hectare, with a production of 31.10 million tons (Anonymous, 2016). The average productivity of annual oilseeds revolves around 1159kg/ha, which is about a ton less than that of world's average. The drivers agro-ecological region in the country are favorable for growing all the nine annual oilseeds which include seven edible oilseeds *viz.* groundnut, mustard, soybean, sunflower, sesame, niger and safflower and two non-edible oilseeds *viz.* linseed and castor. Among different oilseeds, groundnut, mustard and soybean account for about

80% of the oilseeds are 88% of oilseeds production in the country. In Rajasthan during 2015-16, major area covered under different oilseeds is 29.41 lacs ha in mustard, 8.13 lacs ha in sesame, 8.15 lacs ha in groundnut, 27.40 lacs ha in castor and 9.09 lacs ha in tarameera, producing 34.50, 16.63, 10.06, 38.25 and 7.59 lacs tones having productivity of 1209, 324, 1931, 1449 and 426 kg/ha, respectively (Anonymous, 2016). The area and production of oilseeds in Pali district is very low as compare to state and national acreage and production.

The major objective of FLDs is to show the production potential and profitability of improved technologies vis-à-vis farmers practices under real farm situations. These demonstrations are conducted under the close supervision of scientists of the National Agricultural Research System comprising ICAR institutions, NRCs; Project Directorates, KVKs SAUs and its Regional Research Stations in a block of two to four hectares of land in order to have better impact of demonstrated technology on the farmers and field level extension functionaries. But the Frontline Demonstrations are mainly conducted through KVKs all over the country. The area and production of oilseed in Pali district

is very low as compare to state and national acreage and production. Therefore, it is very essential to demonstrate the high yielding varieties, resistant to biotic and abiotic stress and other oilseed production technologies which the farmers generally do not adopt. Keeping the importance of FLDs, the KVK, CAZRI, Pali conducted demonstrations on oilseed crops viz. mustard, sesame, groundnut and castor at farmers' field under un-irrigated situations in *rabi/kharif* season during the years 2013-14, 2014-15 and 2015-16. The specific objectives of the study were to exhibit the performance of recommended high yielding varieties in mustard and sesame and performance of recommended dose of phosphatic fertilizers in groundnut and castor in harvesting higher crop yields and to compare the yield level of local check (farmers' field) and FLDs fields.

METHODOLOGY

Accordingly, the FLDs under mustard, sesame, groundnut and castor crops laid out in the eight adopted villages namely, Dhamli, Kusalpura, Nayagoa, Bagawas, Khetawas, Nimbali, Khandi and Rampura were selected randomly for the present study. The area under each

Table 1 Performance of recommended High Yielding Varieties of mustard (NRCDR 2)

Crop season	Village	HYVs in FLDs	No. of FLDs	Area (ha)	Yield (kg/ha)		Increase in %
					Maya	Local	
Rabi 2014	Dhamali	Maya	5	1.5	1450	1050	38.1
	Kusalpura	Maya	5	1.5	1380	1090	26.7
	Weighted	Mean	10	3.0	1410	1070	31.8
Rabi 2015	Nayagoa	Maya	5	2.0	1480	1140	29.8

The data in Table 1 revealed that in the *rabi* season 2013, 14 demonstrations of mustard covering 3.0 hectare in 2 villages with variety Maya and local check were planted. An average yield of 14.1q/ha of test variety was obtained, as compared to 10.7q/ha of local check, where per cent increase was accounted at 31.8 per cent, respectively. During the *rabi* season 2010, 5 demonstrations of mustard covering 2.0 ha in one village with variety Maya and local check were planted. An average yield of 14.8q/ha of test variety was obtained, as compared to 11.4q/ha of local check, where per cent increase

Table 2: Performance of recommended dose of phosphatic fertilizer application (60 kg/ha) in groundnut

Crop season	Village	HYV	No. of FLDs	Area (ha)	Yield (Kg/ha)		Increase in Percent
					DAP	No DAP	
Kharif 2014	Kusalpura	TG 37A	10	4	1860	1450	28.3
	Bagawas	TG 37A	5	2	1790	1310	36.6
	Dhamali	TG 37A	5	2	1810	1390	30.2
	Weighted mean		20	8	1820	1380	31.1
Kharif 2015	Khetawas	TG 37A	10	5	1760	1430	23.1
Kharif 2016	Nimbali	TG 37A	6	3	1890	1350	40.0

demonstration was 0.50 hectare. Regular visits by the KVK, CAZRI scientists to demonstration fields were ensured and made to guide the farmers. These visits were also utilized to collect feedback information for further improvement in research and extension programmes. Field days and group meetings were also organized at the demonstration site to provide the opportunities for other farmers to witness the benefits of demonstrated technologies. The critical inputs were duly supplied to the farmers by the CAZRI, KVK, Pali. Data were collected from the FLDs farmers and analyzed with the suitable statistical tools to compare the yield of farmers' field and FLDs.

RESULTS AND DISCUSSION

Performance of recommended high yielding varieties of mustard

The progress of Front Line Demonstrations on oilseed during the year 2013 and 2014 to 2016 exhibit the performance of recommended high yielding variety *i.e.* Maya of mustard is presented in Table 1.

was accounted at 29.8 per cent. The findings confirm with the findings of Singh *et al.* (2007), Lakhera and Sharma (2003) and Jatav (2010).

Performance of recommended dose of phosphatic fertilizer application (60 kg DAP/ha) in groundnut:

The progress of Front Line Demonstration on oilseeds during *kharif*, 2008, 2009 and 2010 to exhibit the performance of recommended dose of 60 kg/ha DAP in groundnut is presented in Table 2.

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The data in Table 2 indicated that in the *kharif* season 2013, the application of 60 kg DAP/ha, as demonstrated factor in 20 demonstrations covering 8 ha of land in 3 villages resulted in 18.2 and 13.8q/ha yield in DAP and non-DAP plots of groundnut (RTG 37A), respectively. This accounted for 31.1 per cent at average increase in the yield. During the *kharif* season 2014, the application of 60 kg DAP/ha, as demonstrated factor in 10 demonstrations covering 5 ha of land in one village resulted in 17.6 and 14.3 q/ha yield in DAP and non-DAP plots of groundnut (TG 37A), respectively in Table 2. This accounted for 23.1 per cent average increase in the yield. In the *kharif* season 2010, the application of 60 kg DAP/ha, as demonstrated, factor in 6

demonstrations covering 3 ha of land in one village in 18.9 and 13.5 q/ha yield in DAP and non-DAP plots of groundnut (TG 37A), respectively (Table 2). This accounted for 40.0 per cent average increase in the yield. The findings confirm with the findings of Yadav *et al.* (2007), Meena and Singh (2017), and Meena *et al.* (2013).

Performance of High Yielding Variety (RT 346) of sesame

The progress of front line demonstrations on oilseeds during *kharif* season, 2008, 2009 and 2010 to exhibit the performance of recommended high yielding variety, viz., RT 346 of sesame is presented in Table 3.

Table 3 : Performance of high yielding variety sesame (RT 346)

Crop season	Village	HYV	No. of FLDs	Area (ha)	Yield (kg/ha)		Increase in Percent
					RT 346	Local	
Kharif, (2013-14)	Khandi	RT 346	05	2.0	840	580	24.97
	Nasyagoa	RT 346	05	2.0	790	510	54.90
	Bagawas	RT 346	05	2.0	850	480	77.08
	Khetawas	RT 346	02	1.0	790	500	58.00
	weighted		17	7.0	820	530	54.72
Rabi, (2014-15)	Nimbali	RT 346	05	2.0	950	620	53.23
	Bagawas	RT 346	05	2.0	830	580	43.10
	Rampura	RT 346	04	1.5	790	590	33.90
	Khandi	RT 346	04	1.5	860	630	36.51
	Weighted		18	7.0	860	610	40.98
Rabi, 2015-16)	Khetawas	RT 346	05	2.0	980	570	71.93

The data in Table 3 revealed that during *kharif* (2013-14) season, 17 demonstrations of sesame covering 7 ha of land in 4 villages resulted in 18.2 and 5.3q/ha yield in test variety RT 346 and local check, respectively. This accounted for 54.72 per cent average increase in the yield. In *Kharif* (2013-14) season, 18 demonstrations of sesame covering 7 ha of land in 4 villages resulted in 8.6 and 6.1 q/ha yield in test variety RT 346 and local check, respectively. This accounted for 40.98 per cent average increase in the yield. Five demonstrations of sesame (2013-14) season, covering 2 ha of land in one village resulted in 9.8 and 5.7q/ha yield test variety RT 346 and local check, respectively. This accounted

for 71.93 per cent average increase in the yield (Table 3). The findings confirm with the findings of Padmaiah and Venkattakumar (2009) and Gaikwad (2011), Sharma and Thomas (2014), Meena *et al.* (2014), Sharma *et al.* (2014), Yadav *et al.* (2016) and Singh *et al.* (2016).

Performance of recommended dose of phosphatic fertilizer (40 kg/ha) in castor crop:

The progress of front line demonstrations on oilseeds during *kharif* season, 2007-08, 2013-14 and 2014-15 to exhibit the performance of recommended dose of phosphatic fertilizer (50 kg/ha) in castor crop is presented in Table 4.

Table 4 Performance of recommended dose of phosphatic fertilizers (40 kg/ha) in castor crop

Crop season	Village	HYV	No. of FLD	Area (ha)	Yield (Kg/ha)		Increase in %
					DAP	No DAP	
Kharif 2014	Rampura	GCH 7	5	2	1000	750	33.33
Kharif 2015	Kusalpura	GCH 7	5	2	840	500	68.00
Kharif 2016	Nayagoa	GCH 7	5	2	910	610	49.18

The data in Table 4 showed that during *kharif* (2007-08) season, 5 demonstrations of castor covering 2 ha in one village with variety GCH 7 using DAP @ 40 kg/ha and without of demonstrations was obtained 10.0q/ha, as compared to 7.5 q/ha of check, where per cent increase was accounted at 33.33 per cent. Further, in *kharif* (2013-14) season, 5 demonstrations of castor covering 2 ha in one village with variety GCH 7 using DAP @ 40 kg/ha and without DAP (Local check) were planted. An average yield of 8.4q/ha of demonstrations was obtained, as compared to 5.0q/ha of local check, where per cent increase was accounted at 68.00 per cent (Table 4). During *kharif* (2013-14) season, in castor, 5 demonstrations covering 2.0 ha in one village with variety GCH 7 using DAP @ 40 kg/ha and without DAP (check) were planted. An average yield of 9.1 q/ha of demonstrations was obtained, as compared to 6.1 q/ha of local check, where per cent increase was accounted at 49.18 (Table 4). The results of this study are confirm with the findings of the study carried out by Kumawat (2008), Singh *et al.*, Mishra, *et al.* (2007), Singh (2007), Mitra and Samajdar (2010), Roy *et al.* (2011), Meena *et al.* (2012), Meena and Singh (2016) and Mann and Sharma (2017).

CONCLUSION

It may be concluded that the yield of demonstrated plots was higher than local-check plots. There is need of duration high yielding mustard varieties in this area to fit well in mustard-green gram cropping pattern for timely sowing of mustard after harvesting of green gram crop. Weed management studies for the mustard, sesame; groundnut and castor need to be intensified for timely control of these unwanted plants efficiently and effectively. The location based nutrient application for oilseeds to be thoroughly reviewed and investigated. The use of bio-pesticides needs concentrated and composite efforts both at research generating and technology dissemination system.

ACKNOWLEDGEMENT

The authors are highly grateful to the Director, Central Arid Zone Research Institute, Jodhpur for his constant guidance and encouragement. The services of Mr. P.K. Tomer, Programme Assistant (Computer), in conducting frontline demonstrations and compiling the data are also thankful acknowledged.

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