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Impact of Front Line Demonstrations on Barley Production in Arid Zone

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Abstract: *The study was carried out during* rabi *seasons of 2013-14 and 204-15 in four village namely Didu and Sankariavillage of Jaisalmer, Mansagar and Govindpuravillage of Jodhpur districts of Rajasthanto assess the impact of front line demonstrationconducted by Central Arid Zone Research Institute, Jodhpur on yield and economics of barley production .The data were collected from 63 farmers. The findings of the study results revealed that improved technology recorded a mean yield of 3733 kg/ha which was 17.57 per cent higher than obtained by farmers practices (3175 kg/ha). The higher net returns (Rs. 27794/ha) and benefit: cost ratio of 0.97 was obtained with improved technologies in comparison to farmer's practices (Rs. 21005 and 0.64).*

Keywords: *Barley, Front line demonstration, extension gap, technology gap.*

INTRODUCTION

Barley is an important *rabi* cereal crop of Rajasthan, it occupies about 3.09 lakh ha area, which accounts for 8.78 percent of the total *rabi* cereals area of the state but contributed 7.87 percent to total rabi cereals production of the state. The average productivity of barley is 3046 kg/ha (2013-14) which is low as compared to wheat (3438 kg/ha) and total *rabi* cereals (3402 kg/ha).

Low productivity of traditional varieties is a cause of concern for farmers at large. There is a considerable scope for increasing the productivity of barley by using improved practices. There is a considerable scope for increasing the production of the crop. A number of technologies for the barley crop improvement have been generated by the Research Institutes and Agricultural Universities, but only few of them have been accepted by the farmers. Therefore, the present study was conducted to assess the impact of Front line demonstration on barley production in arid zone.

RESEARCH METHODOLOGY

The study was carried out by Central Arid Zone Research Institute, Jodhpur during 2014-15 to 2015-16 (two consecutive years) at farmers' fields of four villages namely Deedhu and Sankadia ofJaisalmer district, Govindpura and Mansagar villages of Jodhpur district of Rajasthan. During these two years of the study, an area of 30ha was covered under front line demonstration. Before selection of farmers for FLDs, a comprehensive list of all barley growers were prepared.

Out of list so prepared 34 in rabi 2014-15 and 39 in rabi 2015-16 were selected among 4 adopted villages with the help of randomly sampling methods.During the selection procedure, repetition of farmers was completely avoided. Thus a total 63 farmers were included in the study. Intensive trainings were imparted to the selected farmers regarding different aspects of barley cultivation in each year. The differences between the demonstration

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package and existing farmers, practices are mentioned in Table 1. In demonstration plots, use of quality's seed of improved varieties (RD-2660RD-2786, RD-2052, RD-2715), line sowing, seed treatment and timely weed control, as well as recommended dose of fertilizer (60 kg nitrogen + 40 kg phosphorus) were emphasized. In the demonstration, one control plot was also kept where farmers practices was carried out. All demonstrations were conducted under the supervision of CAZRI scientists.

All the production and protection technology other than interventions were applied in similar manner in demonstrated as well as in farmers practices. The data on output were collected from FLD plots as well as control plots and finally the yield attributes, grain yield, cost of cultivation, net returns with the benefit cost ration was worked out.

The extension gap, technology gap and technology Index was calculated by using following formulas as given by Samui *et al.* [8].

Technology gap =

Pi (Potential yield) – Di (Demonstration yield)

Extension gap

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

$$\text{Technology Index (\%)} = \frac{\text{Technology gap}}{\text{Potential yield}} \times 100$$

RESULTS AND DISCUSSION

A comparison of productivity levels between demonstrated varieties and local check is shown in Table 1. During the period under study, it was observed that in front line demonstration, the improved barley varieties recorded the average higher seed yield (3733 kg/ha) as compared to local check (3175 kg/ha). The percentage increase in yield over local check was 17.57. The results clesrly show the positive effects odf FLD over the existing practices words enhancing the yield of barley in the study area with its positives effect on yield attributes *viz* plant highetinj cm, tillers/ear, grain/ear and 1000 grain weight (Table 2). Higher value of grain yield, yield attributes obtained under demonstration plots might be due to improved varieties and recommended practices and better managements. valueSimilar yield enhancement in different crops in front line demonstration has amply been documented by Jeengar *et al.*[2], Hiremath *et al.* [3],

Table 2
Yield attributes under demonstration package and existing famer's practices

S. No.		*Demonstration package*	*Existing famer's practices*
1.	Plant height (cm)	80-90	82-86
2.	Tillers/m	87-98	73-77
3.	Grains/ear	20-23	18-20
4.	1000 grain weight (g)	44-47	38-41

Table 1
Comparison between demonstration package and existing farmers practices of barley production

		Barley	
S. No.	*Interventions*	*Demonstration package(Improved practices)*	*Farmers practices*
1.	Farming situation	Irrigated	
2.	Variety	RD-2660RD-2786, RD-2052, RD-2715	Local
3.	Seed treatment	Seed treatment with mancozeb @ 2g/kg seed	Nil
4.	Time of sowing	1-30 November	15-30 December
5.	Method of sowing	Line sowing proper crop geometry	Broadcasting
6.	Seed rate	90-100 kg/ha	100-125 kg/ha
7.	Fertilizer dose	60 kgN and 40 kgP	Negligible
8.	Plant protection measures	Need based application	Nil
9.	Weed management	Pendimethaline 3 liter/ha as preplant incorporation following by one hand weeding at 30 days after sowing (DAS)	One hand weeding at 30-35 DAS

Dhaka *et al*. [1] and Patel *et al*. [9]. From these results it is evident that the performance of improved variety as found better than the local check under same environment conditions. Farmers were motivated by results of agro technologies applied in the FLDs trials and it is expected that they would adopt these technologies in the coming years.

Extension gap ranged from 440 to 680 kg/ha during the period of the study emphasizes the need to educate the farmers through various means for adoption of improved agricultural production to reverse the trend of wide extension gap.The technology gap shows that the gap in the demonstration yield over the potential yield and it was maximum in the year 2015-16 (530 kg/ha) and lowest in the year 2014-15 (210 kg/ha). However, overall average technology gap in the study was 392 kg/ha (Table 3). The technological gap obtained may be attributed to dissimilarity in soil fertility status and weather condition.These findings are similar to the findings of Sharma and Sharma [6] and Patel *etal.* [9].

Technology index shows the feasibility of improved technology at the farmer's field. The lower the value of the technology index more is the feasibility of technology (Jeengar*et al*. [2]). Data presented in Table 3 revealed that the technology index value was varied between 5.25 to 12.62 per cent and average 9.56 per cent during the period study. Results of the present study are in consonance with the findings of Singh et al. [7] and Hiremath and Nagaraju[4].

The cost of improved technologies was estimated by the yield economic calculations (Table 4). The improved practices in barley front line demonstration exhibited high value returns. Regards economic returns, the gross return of improved technologies was higher in FLD plots than farmers practices. The average gross returns of demonstrations was Rs. 56244/ha as against local check (farmers practices) of Rs. 48455/ha. The cost of cultivation was higher in FLD plots as compared to local check. The average cost of cultivation has been Rs. 28450 in FLD as against of Rs. 27450 for local check. The

Table 3
Variety wise yield performance of barley under FLDs (Improved practice-IP) and farmers Practice (FP)

				Seed yield (kg/ha)						
Year	*Name of variety*	*Area (ha)*	*No. of Demo.*	*Potential*	*IP*	*FP*	*% increase in yield over control*	*Extension gap (Kg/ha)*	*Technology gap (Kg/ha)*	*Technology index*
2014-15	RD-2660	8.0	20	4000	3790	3190	18.80	600	210	5.25
	RD-2786	6.0	14	4000	3630	3190	13.79	440	370	9.25
2015-16	RD-2052	8.4	21	4200	3840	3160	21.52	680	460	10.95
	RD-2715	7.6	19	4200	3670	3160	16.14	510	530	12.62
	Total/Mean	30.0	64	4100	3733	3175	17.57	558	392	9.56

Table 4
Economics of barley under front line demonstration

		Cost of cultivation (Rs./ha)		*Gross return (Rs./ha)*		*Net return (Rs./ha)*		*B C ratio*	
Year	*Name of variety*	*FP*	*IP*	*FP*	*IP*	*FP*	*IP*	*FP*	*IP*
2014-15	RD-2660	48405	54195	27500	28400	20905	25795	0.51	0.91
	RD-2786	48405	57255	27500	28400	20905	28855	0.51	1.02
2015-16	RD-2052	48505	58300	27400	28600	21105	29700	0.77	1.04
	RD-2715	48505	55225	27400	28400	21105	26825	0.77	0.94
	Mean	48455	56244	27450	28450	21005	27794	0.64	0.98

average net returns of demonstration was Rs. 27794 while in local check it was Rs. 21005. Cost benefit ratio was 0.97 in demonstration while in local practices it was 0.64. The results are in accordance with the findings of Hiremath *et al*.[3], Hiremath and Nagaraju [4], Rao *et al* [5] and Patel *etal*.[9].

CONCLUSION

The findings of the study revealed that wide gap existedin potential and demonstration yield in high yielding barley varieties due to technology and extension gap in arid zone. By conducting front line demonstrations proven technologies,yield potential of barley can be increased toa great extent. This will substantially increase the income as well as the livelihoods of the farming community.The study emphasizes that the needs to educate the farmers in adoption of improved technology to narrow the extension gap through various technology transfer center. Therefore it is suggested that these factors may be taken for consideration to increase the scientific temperament of the farmers.

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