

## Original Research Article

# Impact of Front Line Demonstration on Yield and Economics of Wheat

Ashok Kumar<sup>1</sup>, Govind Kumar<sup>2</sup>, Rajeeve Singh<sup>1</sup>, Anil Kumar Ravi<sup>1</sup>,  
Devendra Mandal<sup>1</sup> and Jakir Hussain<sup>1</sup>

<sup>1</sup>KrishiVigyan Kendra, Gaya, Bihar Agricultural University, Sabour, Bhagalpur (Bihar), India

<sup>2</sup>Krishi Vigyan Kendra, Purnea, Bihar Agricultural University, Sabour, Bhagalpur (Bihar), India

*\*Corresponding author*

## ABSTRACT

The present investigation was done by krishiVigyan Kendra, Manpur, Gaya in its 5 adopted villages (Bersima, Nawada, Mahmaddpur, Sikahar and Sanaut) to know the Yield Gap, Economic Return, Extent of farmer's satisfaction and Constraints faced by the farmers. In this study, 100 respondents selected were all those farmers on whose field FLD was conducted during the years 2015-16 and 2016-17. The plot size was 0.4ha for both Demonstration and Local check. Before conducting FLD, the respondents were made abreast with the latest recommended package of practices of wheat. The demonstrated technologies under FLD resulted in an increase in yield by 19.15 percent over Local Check. It was also observed that there was technology gap (TG), extension gap (EG) and technology index (TI) of 9.11q/ha, 4.96 q/ha and 22.76 percent respectively. The economic performance of wheat under FLD showed an additional return of Rs.8085.5 / ha and additional cost of cultivation of Rs. 1525/ha with BC ratio of 1.91 for demonstration and 1.70 for Local Check. The respondent satisfaction index (RSI) revealed that majority of respondent farmers expressed high (57.00percent) level of satisfaction about Front Line Demonstration. Unavailability of improved seed varieties of wheat in relation to climate change was found to be most confronting constraint as perceived by them and ranked I.

### Keywords

FLD, yield, Economics, Technology gap, Extension gap, Technology index, Respondent satisfaction index and Constraints

## Introduction

Agricultural activity in Gaya district is by and large confined to traditional cultivation depending primarily on monsoon rainfall and Rabi cultivation in localized patches where irrigation facilities are available. KVKs are grass root level organizations meant for application of technology through assessment, refinement and demonstration of proven technologies under different 'micro farming' situations in a district (Das, 2007). Front Line Demonstration (FLD) is

considered one of the most powerful tools for transfer of technology, as it establishes production potential of various crops and enterprises on farmers field through "Learning by doing and Seeing is believing". While demonstrating the technologies in the farmers' field, the scientists are required to study the factors contributing higher crop production, field constraints of production and thereby generate production data and feedback information. Due to different limiting factors prevailing in the district and use of traditional seeds of wheat, farmers

often fail to achieve the desired potential yield of new wheat varieties. Keeping these in view, FLDs of improved production technology on wheat were conducted to enhance the yield and economic returns and also to identify the constraints related to improved production technologies in wheat crop.

## Materials and Methods

The present investigation was done by krishi Vigyan Kendra, Manpur, Gaya in its 5 adopted villages (Bersima, Nawada, Mahmadpur, Sikahar and Sanaut) to know the Yield Gap, Economic Return, Extent of level of farmer's satisfaction and Constraints faced by the farmers. In this study, 100 respondents were all those farmers on whose field FLD was conducted during the years 2015-16 and 2016-17. Improved seed of wheat was supplied by the KVK under FLD programme. Before conducting FLD, through meeting and training, the respondents were made abreast with the latest recommended package of practices of wheat. Time to time monitoring of FLD plots were carried out by the KVK scientists and farmers were advised to carry out different operations. Data were collected with the help of personal contact. The collected data were calculated and analyzed to draw the inferences. The technology gap, extension gap and technology index were calculated using the following formula as suggested by Samui *et al.* (2000).

$$\text{Percent increase yield} = \frac{\text{Demonstration yield} - \text{local check yield}}{\text{Local check yield}} \times 100$$

$$\text{Extension gap (q/ha)} = \text{Demonstration yield (q/ha)} - \text{Yield of local check (q/ha)}$$

$$\text{Technology gap (q/ha)} = \text{Potential yield (q/ha)} - \text{Demonstration yield (q/ha)}$$

$$\text{Technology index (\%)} = \frac{\text{Potential yield} - \text{Demonstration yield}}{\text{Potential yield}} \times 100$$

During the investigation, satisfaction level of respondent farmers was also assessed in order to know the performance of technology demonstrated. The selected respondents were interviewed personally with the help of a pre-tested and well-structured interview schedule. After that Respondent Satisfaction Index was calculated using the formula as below.

$$\text{Respondent satisfaction index} = \frac{\text{Individual score obtained}}{\text{Maximum score possible}} \times 100.$$

The economic parameters (Cost of cultivation, Gross Return, Net Return and B: C ratio) were worked out on the basis of prevailing market prices of inputs and minimum support prices of outputs. The ultimate objective of generation of any technology, particularly in the field of agriculture, is its speedy diffusion and quicker adoption of by the farmers. But a number of constraints might be held responsible for slowing down the rate of adoption of that technology. Therefore, constraints in wheat were also identified through participatory approach. For this, the respondents were asked to identify 5 major constraints they face the most in wheat cultivation. Respondents were also asked to rank the constraints they perceive as limiting factor for wheat cultivation in order of preference.

## Results and Discussion

### Yield analysis

The yield data of wheat obtained during two year of FLD presented in table- 1 indicates mean yield of 30.89 q/ha and 25.93 q/ha for demonstration and local check respectively. It was also found that the demonstrated technologies under FLD resulted in an increase in yield by 19.15 percent over Local Check. The results found to be in close

conformity with the research results of Sharma *et al.* (2016) and Singh,S.B.(2017).

Table-1. Showed mean extension gap of 4.96 q/ha which is the gap between demonstrated technology and local check. Mean technology gap, the gap between potential yield and demonstration yield, found to be 9.11q/ha. This trend of results emphasizes the need to educate the farmers about latest recommended technology of wheat production in order to narrow down the extension gap. The technology gap observed may be due to climate change and dissimilarity in soil fertility status. Therefore, variety wise location specific recommendation appears to be necessary to minimize the technology gap for yield level in different situations. As far as the technology index is concerned, indicating the feasibility of the evolved technology at the farmer's field. It shows that lower the value of technology index more is the feasibility of the technology. In the present study, mean technology index was found to be 22.76 percent. This result was in conformity with the result of Dhaka *et al.* (2010) and Singh,S.B.(2017).

### **Economic performance**

Table-2 showing the economic performance of wheat under front line demonstration. Though the table reveals higher mean cost of cultivation (Rs.27342/ha) of demonstrated technology as compared to cost involved in local check (Rs.25567/ha) but the demonstration plots fetched higher mean gross returns (Rs.52324.5/ha) and mean net returns (Rs.24982.5/ha) with higher benefit: cost ratio (1.91) as compared to mean gross returns (Rs.44239/ ha), mean net returns (Rs.18672/ha) and benefit: cost ratio (1.63) of local check. Similar result was reported by Joshi *et al.*(2014) and Singh,S.B.(2017)

The perusal of table -2 also reveals higher mean additional return of Rs.8085.5/ha in comparison to mean additional cost of cultivation of Rs.1525/ha. This indicates higher profitability and economic viability of wheat demonstrations under local agro-ecological situation.

Table-3 indicates respondent satisfaction index towards front line demonstration and found that majority of them had high level of satisfaction index (57.00 percent) followed by medium level of respondent satisfaction index (33.00 percent). It was also observed that only 10.00 percent of respondent farmers had low level of satisfaction index. It is quite obvious from the table-3 that majority of respondent farmers fall under higher and medium level of satisfaction level towards performance of technology demonstrated, hence, it indicates a stronger conviction, physical and mental involvement in the frontline demonstrations which in turn would lead to easy and higher adoption of the technology demonstrated. These findings were in conformity with the findings of Dhaka *et al.* (2010) and Singh,S.B. (2017).

### **Constraints in wheat production**

During the study, constraints in wheat production identified through participatory approach presented in table- 4 shows that most confronting constraint faced by the farmers (92.00 percent) in FLD was unavailability of improved seeds variety in relation to climate change which ranked I.85.00 percent of them ranked II as low technical knowledge about recommended package of practices. Followed by lack of irrigation facility (82.00 percent), low soil fertility status (76.00 percent), damage by wild animals (especially Blue cow) (73.00 percent), unavailability of land for timely sowing of wheat (65.00 percent), heavy weed infestation (58.00 percent), lack of proper

markets available for sale of their produce (57.00 percent), Infestation of insects/pests/diseases (50.00 percent) and last ranked but not the least was use of higher

seed rate (38.00 percent). Dhruwet *al.* (2012) and Singh, S.B. also reported similar constraint.

**Table.1** Yield performance of wheat under Front Line Demonstration

Year	No. of Dem <sup>n</sup> .	Area (ha)	Yield (qt/ha)		% increase over Local check	Technology Gap (qt/ha)	Extension Gap (qt/ha)	Technology Index (%)
			Dem <sup>n</sup> .	Local check				
2015-16	50	20.00	30.38	25.56	18.90	9.62	4.82	24.02
2016-17	50	20.00	31.40	26.30	19.40	8.60	5.10	21.50
Mean	50	20	30.89	25.93	19.15	9.11	4.96	22.76

**Table.2** Economic performance of wheat under Front Line Demonstration

Year	Cost of cultivation (Rs/ha)		Gross Return (Rs/ha)		Net Return (Rs/ha)		Additional cost of cultivation (Rs/ha)	Additional Return (Rs/ha)	BC Ratio	
	Dem <sup>n</sup>	Local check	Dem <sup>n</sup>	Local check	Dem <sup>n</sup> .	Local check			Dem <sup>n</sup>	Local check
2015	26922	25222	50689	42678	23767	17456	1700	8011	1.88	1.69
2016	27762	25912	53960	45800	26198	19888	1350	8160	1.94	1.71
Mean	27342	25567	52324.5	44239	24982.5	18672	1525	8085.5	1.91	1.70

**Table.3** Extent of Farmers Satisfaction about Front Line Demonstration

Satisfaction Level	Frequency	Percentage
Low	10	10.00
Medium	33	33.00
High	57	57.00

**Table.4** Constraints faced by the farmers under Front Line Demonstration

S.No	Constraints	Percentage	Rank
1	Low technical knowledge about recommended package of practices	85.00	II
2	Lack of irrigation facility.	82.00	III
3	Unavailability of improved seeds variety in relation to climate change.	92.00	I
4	Infestation of insects/pests/diseases.	50.00	IX
5	Lack of proper markets available for sale of their produce.	57.00	VIII
6	Low soil fertility status.	76.00	IV
7	Heavy weed infestation.	58.00	VII
8	Damage by wild animals (especially Blue cow).	73.00	V
9	Use of higher seed rate.	38.00	X
10	Unavailability of land for timely sowing of wheat.	65.00	VI

From the above facts mention, it could be inferred that using improved production technology the yield and return of wheat can be increased substantially. The yield of wheat under frontline demonstration with improved variety found always greater than the yield of wheat in local check which could further be increased by adopting recommended production technology. However, demonstration yield of wheat is still less than its potential yield. Hence, there is need to disseminate recommended technologies of wheat through effective extension teaching methods i.e. need based training and FLD.

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