International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2018; 6(6): 875-877

Received: 14-09-2018
Accepted: 18-10-2018

Ravindra Tigga
Krishi Vigyan Kendra, Surguja, Chhattisgarh, India

Abhay Kumar
Krishi Vigyan Kendra, Surguja, Chhattisgarh, India

Sachin Kumar
Krishi Vigyan Kendra, Surguja, Chhattisgarh, India

Vinod Kumar Prajapati
Krishi Vigyan Kendra, Surguja, Chhattisgarh, India

Correspondence
Ravindra Tigga
Krishi Vigyan Kendra, Surguja, Chhattisgarh, India

Yield gap analysis through front line demonstration in wheat crop under irrigated situation in Surguja district of Chhattisgarh

Ravindra Tigga, Abhay Kumar, Sachin Kumar and Vinod Kumar Prajapati

Abstract
Front Line Demonstration is one of the most powerful tools for transfer of technology. The present study was undertaken to find out the yield gap through FLDs on wheat crop. Krishi Vigyan Kendra, Surguja, Chhattisgarh conducted 101 front line demonstration on wheat crop at farmers field of seven adopted villages within five blocks during 2014-15 to 2016-17 for transfer of technology. In three year demonstration programme every year demonstration plots with improved package of practices gave higher yield ranges from 34.70 – 38.05 q ha^{-1} as compared to farmers practices (22.65 – 28.75 q ha^{-1}) which could be increased by 32 – 53% grain yield over farmers practices. Maximum technology gap (8.3) and technology index (19.30) recorded in *Rabi* 2014-15 which was later on decreased to 5.4, 4.9 and 9.8, 8.3 in next coming respective years but in case of extension gap, it was maximum (12.05) in the year 2014-15 and then decreased to 14.75 and 11.51 in next two years. It shows positive role of KVK in performance of FLDs under wheat crop to fulfill the yield gap with improvement in socio-economic status of the farmers.

Keywords: front line demonstration; recommended practices; transfer of technology; yield gap

Introduction
Winter cereal in India after rice contributing substantially to the national food security by providing more than 50% of the calories to the people who mainly depend on it. In Surguja district wheat is a major cereal crop of *Rabi* season in rice based cropping system under irrigated condition and maximum farmers grow wheat crop after harvesting of rice and maize in upland and midland situation. There are about 11 thousand hectare area covered by wheat cultivation with an average productivity of 1584 kg ha^{-1}. The climatic condition of this district is quite favourable for wheat cultivation due to prolong & cold winter. But lack of knowledge of improved varieties, sowing method, balance fertilizer, proper weed control and irrigation management etc., leads to very low productivity of wheat yield. However there is still a wide gap between the productions potential and the actual production realized by the farmers. This may be due to partial adoption of recommended package of practices use of improved varieties, proper sowing method, Integrated Nutrient Management, timely weed control and efficent irrigation management etc. by the wheat growers. Technology gap is a major constraint in increasing wheat production Thus, there are tremendous possibilities for ehancing of wheat yield by inclusion of improved techniques in farmers practices (Traditional methods) through front line demonstration. Keeping the above facts in veiw the present study was undertaken to find out the yield gap through FLDs on wheat crop

Methodology
Keeping the above facts in mind the front line demonstration was conducted on farmers field in different adopted villages of five blocks (Surajpur, Ambikapur, Batauli, Lundra and Lakhanpur) in Surguja district during 2014-15to 2016-17. During these four years of study, an area of 36.00 ha was covered under front line demonstraton with active participation of 101 farmers. Before conducting of FLDs a list of farmers was prepared from group meetings and specific skill training was imparted to the selected farmers regarding different aspects of wheat cultivation. The KVK scientists visited the FLDs field regularly on different critical stages of crops to ensure timely application of nutrients, weedicides and plant protection measures and

also to give other suggestive measures to the farmers and collect the feedback information on each stage for further improvement in research and extension programme. The data were collected through personal interview schedule consisting of set of questions, which were asked from the FLD farmers by the investigator in face to face situation to give their response about each improved production technology of wheat. To compare the production and profitability of crop the yield data of FLDs and control plots were collected from each farmers and averaged out in each year at all locations during the study. The collected information was grouped and tabular analysis was done for calculating the technological gap and extension gap in yield by using the suitable statistical tools. In demonstration plots, use of improved varieties, seed treatment, line sowing, balanced fertilizer, proper weed as well as irrigation management were emphasized on the farmers field located on road side in different adopted villages were selected. The Farmers practices were indicated in case of local checks. The data on output were collected from both FLD plots as well as control plots and finally the extension gap, technology gap and technology index were worked out. The differences between the demonstration package and existing farmers practices are mentioned in (Table 1). In general, the soils under study were sandy loam soil in texture with a $_{p}$H range in between 5.5 to 6.2. The available nitrogen, phosphorous and potassium varied between 100-250, 26-60, 250-300 Kg/ha, respectively. However, the soils were deficient in micro nutrients particularly zinc. In demonstration plots, use of quality seeds of improved varieties, timely weeding, need based pesticides as well as balanced fertilization, irrigation were emphasized and comparison has been made with the existing practices (Table 1). The necessary step for the selection of site and farmers, lay out of demonstration, etc. were followed as suggest by Chaudhary (1999) [1]. The tradition practices were maintained in case of local check. The data output were collected from both FLD plots as well as control plot and finally the extension gap, technological gap, technological index along with the benefit-cost ratio were calculated. (Samui *et al.* 2000) [3]. as given below.

Technology gap = Potential yield - Demonstration yield

Extension gap = Demonstration yield - Farmers yield

$$\text{Technology index} = \frac{\text{Potential yield - Demonstration yield}}{\text{Potential yield}}$$

Table 1: Comparison between demonstration and existing pactices under FLD Wheat Crop

Particulars	Demonstration package	Farmers practice
Farming situation	Irrigated upland & midland	Irrigated upland & midland
Variety	GW366	WH-147
Time of sowing	15 November to 10 December	Second fortnight of December
Method of sowing	Line Sowing	Broadcasting
Seed rate	100 kg ha^{-1}	130 kg ha^{-1}
Seed treatment	Azotobactor @ 5-10 gm per kg seed	Nil
Fertilizer Dose	100:60:40 kg ha^{-1}, NPK	50:40:10 kg ha^{-1}, NPK
Weed management	Isoproturon @ 1.0 kg ai ha^{-1} as pre emergence.	Nil
Water management	Irrigation at critical stages	Frequent Irrigation

Results and Discussion

The data from the Table 2 indicated that the demonstration plots with improved package of practices gave higher yield ranges from 34.70 – 38.05 q ha^{-1} with an average of 36.45 q ha^{-1} as compared to farmers practices (22.65 – 28.75 q ha^{-1} with an average of 36.06 q ha^{-1}) which could be increased by 32 – 53% with an average of 40.66% grain yield over farmers practices. Overall, the yield of demonstration plots exceeded that of farmers plot in all the years. Similarly, Kirar *et al.* (2005) [2]. Tomer *et al.* (2003) [6]. Tiwari and Saxena (2001) [4]. And Tiwari *et al.* (2003) [5]. Also reported that increase in productivity and income gain under FLD's over traditional practices.

Table 2: Yield performance of front line demonstration of wheat conducted during 2014-15 to 2016-17 (3 years)

Year	Area (ha)	No of famers	Yield (q ha^{-1})		% increase in yield
			Demo.	Local Check	
2014-15	20.00	50	34.70	22.65	53
2015-16	10.00	38	36.60	26.80	37
2016-17	06.00	13	38.05	28.75	32
Total/Mean	36	101	36.45	26.06	40.66

The data revealed that the technoloy gap existing between the potential and demonstrable yields ranging between 4.9-8.3 q ha^{-1} with an average of 6.21 q ha^{-1}. The technology gap observed may be attributed to the dissimilarity in soil fertility status and climatic condition. The Study also indicates that an extension gap exists between the improved and farmers practice with an avereage of 10.05 q ha^{-1}. Technology index varied from 11.51 to 19.30% with and average of 15.18% which gave evidence that there was scope for further improvement in the productivity of wheat in irrigated condition. The technology index showed the feasibility of the en volved technology at the farmers fields. Technology gap imply researchable issues for realization of potential yield, while the extension gap imply what can be achieved by the transfer of existing technologies. (Table 3)

Table 3: Technology gap, Extension gap and Technology index in Wheat under Front Line Demonstration

Year	Variety	Potential yield (q ha^{-1})	Demo. Yield (q ha^{-1})	Farmers Yield (q ha^{-1})	Technology Gap (q ha^{-1})	Extension Gap (q ha^{-1})	Technology Index (%)
2014-15	GW-273	43.00	34.70	22.65	8.3	12.05	19.30
2015-16	WH-1105	42.00	36.60	26.80	5.4	9.80	14.75
2016-17	GW-366	43.00	38.05	28.75	4.9	8.30	11.51
Total/Mean		42.66	36.45	26.06	6.21	10.05	15.18

Conclusion

From the above findings it can be concluded that use of improved practices of wheat cultivation can reduce the technology gap to a considerable extent thus leading to increased productivity of wheat in Surguja district. Moreover, extension agencies in the district need to provide proper technical support to the farmers through different educational and extension methods to reduce the extension gap for better wheat production in the district. Finally, front line demonstration is a effective tools of technology transfer in crop production because it encourage to farmers for accept and adopt the improved cultivation techniques due to increased in grain yield and decreased in production cost. Technology index which shows the feasibility of the technology demonstrated has depicted good performance of the intervention.

References

1. Chaudhary BN. Krishi Vigyan Kendra- A guide for KVK managers. Division of Agricultural Extension, ICAR, 1999, 73-78.
2. Kirar BS, Mahajan SK, Nashine R, Awasthi HK, Shukla PK. Impact of technological practices on the productivity of soybean in front line demonstration. Indian. Res. J Extn. 2005; 5(1):15-17.
3. Samui SK, Maitra S, Roy DK, Mandal AK, Saha D. Evaluation of front line demonstration on groundnut. J Indian Soc. Coastal Agric. Res. 2000; 18(2):180-183.
4. Tiwari KB, Saxena A. Economic analysis of FLD of oilseed in Chhindwara. Bhartiya Krishi Anusandhan Patrika. 2001; 16(3&4):185-189.
5. Tiwari RB, Singh V, Parihar P. Role of FLD in transfer of gram production technology. Maharastra J Ext. Edu. 2003; 22(1):19.
6. Tomer LS, Sharma BP, Joshi K. Impact of Front Line Demonstration of soyabean in transfer of improved technology. J Ext. Edu. 2003; 22(1):139.