Yield Gap Analysis through Front Line Demonstration in Wheat

ABSTRACT

For demonstrate recommended technologies among farmers, front line demonstration is an effective and appropriate tool. Krishi Vigyan Kendra, SDAU, Tharad (Banaskantha-II) conducted eighty demonstrations on wheat with recommended package of practices during 2018 to 2021 in the villages of Banaskantha district. The study found, the yield of wheat in improved practises under irrigated conditions ranges from 44.52 to 45.02 q/ha whereas in Farmer Practices it ranges between 38.85 to 40.99 q/ha. The per cent increase in yield with IP over FP was recorded in the range of 9.03 to 15.39 per cent. The extension gap were ranging from 3.80 to 5.98 q/ha. The trend of extension gap reflected the farmer's cooperation in carrying out demonstrations with encouraging results in subsequent years and also it is the impact of training given by KVK scientist. The cost benefit ratio was 2.19 to 2.87 under demonstration, while it was 1.44 to 2.34 under local check. By conducting front line demonstration of proven technologies, yield potential of wheat crop could be enhanced to a great extent with increase in the income level of the farming community.

INTRODUCTION

Wheat has been described as "Staff of life or king of cereals" and one of the most important staple food crop. Wheat has its own outstanding importance as a human food; it is rich in carbohydrates and protein. Wheat is cultivated in at least 43 countries of the world. Front Line Demonstration (FLD) was started in wheat to generate production data and feedback information to various development agencies, which are engaged in dissemination of technological advances through researchers to the farmer's fields. Eighty FLDs were conducted from 2018 to 2021 in Banaskantha district of Gujarat to demonstrate the improved wheat production technologies that are suitable for that particular eco-system. The concurrent impact of such demonstrations is given in (Table 1). An attempt was made to analyze the impact of the demonstrations in vertical and lateral spread of the technologies and the resultant improvement in yield and income of the wheat growers, with the following objectives: (a) to document the profile characteristics of wheat growers; (b) to assess the knowledge and adoption level of wheat growers in Banaskantha district of Gujarat as an impact of FLDs; (c) to assess the impact of frontline demonstrations on yield and income obtained by the wheat growers; (d) to delineate the constraints encountered by the wheat growers in Banaskantha district of Gujarat and (e) to suggest strategies to improve the wheat cultivation scenario in Gujarat. It was found that farmers were using old varieties of wheat crop without proper use of recommended scientific package of practices. Keeping in view the constraints, KVK, Banaskantha-II conducted front line demonstrations on wheat crop which would ensure livelihood and economic empowerment of tribal households at faster pace.

MATERIAL AND METHOD

The present study was carried out during the year 2018 to 2021 in the (Dhunsol, Kotda, Khoda. Kuda and Ratanpura) villages of Banaskantha district of Gujarat. Eighty

numbers of demonstrations was conducted in different villages with an objective to identify the yield gaps as well as to work out the difference in input cost and monetary returns under frontline demonstrations and farmers' practices (local checks) of wheat crop. The critical inputs were applied as per the scientific package of practices recommended by Wheat Research Station, SDAU, Vijapur, Gujarat (Table 1). The component demonstration of front line technology in wheat was comprised of improved variety GW-451, Line sowing, seed treatment of biofertilizer, integrated pest management for termite, proper seed rate, balance dose of fertilizer and weed management (Table 1). The data on production cost and monetary returns were collected for four years (2018 to 2021) from frontline demonstration plots to work out the economic feasibility of improved and scientific cultivation of wheat. Besides, the data from local checks, data were also collected where farmers were using their own practices for cultivation of wheat. Extension gap was calculated as given by (Samui *et al*., 2000) as:

Extension gap = Demonstration yield – Yield from farmers practice (Local check)

$$\text{Percent increase yield} = \frac{\text{Demonstration yield farmers yield}}{\text{Farmers yield}} \times 100$$

Table.1 Difference between technology intervention and farmers practice under FLD on wheat

Particulars	Technology intervention	Existing practice	Gap
Variety	GW-451	Old variety	Full gap
Sowing tme	15 – 25 November	Early (October) or Late (December)	Full gap
Seed rate	125 kg/ha	100-150 kg/ha	Partial gap
Sowing method	Line sowing (22.5 cm)	Broadcasting	Full gap
Seed treatment	Azotobacter and Bifenthrine	No seed treatment	Full gap
Fertilizer dose	(120:60:00: kg NPK/ha)	Not decided	Full gap
Weed management	Pre-emergence application of Pendimethalin @1.0 kg a.i./ha	One or two hand weeding	Partial gap
Plant protection	Need based plant protection Measure and seed treatment for termite control	Used different pesticides	Uneven use of pesticide

Source : Scientific cultivation of cereal crop (Gujarati laungage), Book published by Wheat Research Station, SDAU, Vijapur (2015-16)

RESULTS AND DISCUSSION

Technology intervention and farmers practice under FLD on wheat

The gap between the existing and recommended technologies of wheat in district Banaskantha presented in (Table 1). Full gap was observed in case of high yielding variety, sowing time and method, seed treatment, fertilizer dose and in case seed rate and weed

management observed partial gap which definitely was the reason of not achieving potential yield. Farmers were not aware about recommended technologies. Farmers in general used old-age varieties with improper spacing and fertilizer because of lack of awareness. In plant protection measures farmers used uneven pesticide and high dose of pesticides so their cost increases.

Productivity and Economic impact of front line demonstrations

During the period of study, the inputs and outputs prices of commodities prevailed during each year of demonstrations were taken for calculating benefit cost ratio (Table 2). The economic analysis under front line demonstrations in improved practices (IP) recorded higher productivity and B: C ratio over local check (Farmer practices) in each year. These might be due to knowledge and adoption of full package of practices i.e. sowing of latest high yielding variety with proper spacing, adoption of improved nutrient management, adoption of improved weed management and pest management techniques. Similar results have been reported earlier by Romade *et al.*, (2018) and Kumar *et al*., (2015). The year wise fluctuation in yields was observed mainly on the account of variations in soil fertility status, climate and moisture availability.

Result revealed that yield of wheat in improved practises ranges from 44.52 to 45.02 q/ha whereas in Farmer Practices it ranges between 38.85 to 40.99 q/ha. The per cent increase in yield with IP over FP was recorded in the range of 09.03 to 15.39 per cent. The cost benefit ratio was 2.19 to 2.87 under demonstration, while it was 1.44 to 2.34 under local check. By conducting front line demonstration of proven technologies, yield potential of wheat crop could be enhanced to a great extent with increase in the income level of the farming community.

Table : 2 Wheat production, economics and extension gap of FLDs and local check

Year	Number of demonstration	Average yield (q/ha)		Percent increase in yield over local	Extension gap (q/ha)	B : C ratio	
		Improved practice	Farmer practice			Improved practice	Farmer practice
2018	15	44.83	38.85	15.39	5.98	2.53	1.92
2019	15	45.02	39.89	12.86	5.13	2.49	1.44
2020	25	44.52	40.54	09.81	3.98	2.19	1.75
2021	25	44.79	40.99	09.03	3.80	2.87	2.34

Extension gap

Extension gap of 5.98 q/ha, 5.13 q/ha and 3.98 q/ha was recorded in the year 2018 to 2020 respectively as compare to the year 2021 (3.80 q/ha). This emphasized the need to educate the farmers through various extension means i.e. front line demonstration for adoption of improved production and protection technologies, to revert the trend of wide extension gap. By horizontal spread of improved practices through front line demonstration, we can aware farmers about more and more use of latest production technologies with high yielding varieties which will subsequently change this alarming trend of galloping extension gap. Romade *et al*., (2018) has also opined that depending on identification and use of

farming situation, specific interventions may have greater implications in enhancing system productivity.

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