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Impact of Front Line Demonstrations on Rice Production and Economics

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Abstract

The results of present study revealed that average highest yield in demonstration was recorded both the 28.8 q/ha and 38.08 q/ha were obtained in demonstrated plot over farmers practice (19.20 q/ha and 18.40 q/ha) with an additional yield of 9.60 q/ha and 20.40q/ha the increasing the average rice productivity by 50.00 percent and 110.86 percent. Besides this, the demonstrated field gave higher gross return Rs. 63360 and 68544 compared to farmers practice Rs. 42240 and Rs 33120 and Demonstration provided higher net return of Rs17720 and Rs 19244/ha with higher benefit cost ratio 1.39 when compared to farmer's practice, respectively. The front line demonstration technology was more profitable as compared to farmer practices.

Keywords: Front Line Demonstration, Technology, Production, Economics, Rice

Introduction

Rice production in India is an important part of the national economy. India is the world's second-largest producer of rice, and the largest exporter of rice in the world. Production increased from 53.6 million tons in FY 1980 to 120 million tons in FY 2020-21.

Rice is one of the chief grains of India. Moreover, this country has the largest area under rice cultivation. As it is one of the principal food crops. It is, in fact, the dominant crop of the country. India is one of the leading producers of this crop. Rice is the basic food crop and being a tropical plant, it flourishes comfortably in a hot and humid climate. Rice is mainly grown in areas that receive heavy annual rainfall. That is why it is fundamentally a *Kharif* crop in India. It demands a temperature of around 25 degrees Celsius and above, and rainfall of more than 100 cm (39 inch). Rice is also grown through irrigation in those areas that receive less rainfall. Rice is the staple food of eastern and southern parts of India.

Rice is one of the most important crops in India, and plays a important role in food security. It is a choice crop of the millions of poor and small farmers not only for income but also for household food security. India has the largest area under rice worldwide with 46.38 million hectares and a production that comes second only behind China in total rice production. The current productivity is still much lower and needs to be increased within the limits of the scope for expanding the area or irrigation coverage,

The most important rice-growing regions in India are Assam, West Bengal, coastal regions of Odisha, Andhra Pradesh, Telangana, Tamil Nadu, Kerala and Maharashtra. Recently, paddy has also become an important crop of Punjab and

Haryana. Rice contributes of major role of the country's total food grain production. According to the data released by the government of India, the total rice production in India stands at 130.29 million Tones in the year 2021-22. (Sources: 4th AE, E & S Division, DA&FW, 2021-22 FAE, New Delhi).

About one-fourth of the total cultivated area of the state is devoted to rice cultivation. The unusual interest shown by the farmers in the rice culture; supported by the easy availability of HYV seeds, fertilizers and uninterrupted supply of irrigation are the chief factors responsible for this progress. Conducting front line demonstrations of proven technologies the yield of rice can be increased to a great extent. This will substantially increase the income as well as the livelihood of the farming community.

Materials and Methods

Front line demonstration is one of the most powerful tools for transfer of new technology. These trials were conducted during kharif seasons 2019-20 and 2020-21 by Krishi Vigyan Kendra Bichpuri, Agra (U.P) adopted villages Ardaya, Nagariya Ninvaya Nagla, Vishnu Barbar, Chandi. The soils of the farmer's field were sandy loam in texture and medium in phosphorus, low in organic carbon and nitrogen. The Technology used for Front line demonstration included treatments as farmer practices (T-1): Local variety. FLDs (T-2):120 kg N, 60Kg P, 40 Kg K, 12.5 kg Zinc (33 percent), and 20 Kg Sulphur with Pusa Basmati 1509 variety.

Economics of the treatments: Economics of the treatments recommendation and adoption of any practice by cultivators depends upon its economics. Therefore, it becomes essential to work out economics of the treatments tested for judging the best treatment under study, for getting higher net profit per hectare

Cost of cultivation (Rs./ha) : For different treatments total cost was calculated on the basis of prevailing market rates of fertilizer, field preparation, sowing of seeds, labour charges, cultural and intercultural operations as well as expenditure an herbicides, harvesting and threshing of the crop produce etc.

Gross return (Rs./ha): For different treatments gross returns were calculated on the basis of prevailing market rate of produce.

Net return (Rs./ha): It was calculated treatment wise. The cost of cultivation per hectare was subtracted from the gross income for computing net returns of each treatment.

Net profit (Rs./ha): Gross return (Rs./ha) - Cost of cultivation (Rs./ha)

The BCR formula was calculated in given below.

$$BCR = \frac{\text{Gross return}}{\text{Gross cost}}$$

Table 1 Grain yield of farmer practices and front line demonstration

Treatments	Average grain yield(q/ha)		Number of farmer
	2019-20	2020-21	
T-1: Farmer practices	19.20	18.40	05
T-2: Front line demonstration(FLD)	28.80	38.08	05

Table 2 Economics of farmer practices and front line demonstration

Treatments	Gross cost (ha^{-1})		Gross return (ha^{-1})		Net return (ha^{-1})		B:C Ratio	
	2019-20	2020-21	2019-20	2020-21	2019-20	2020-21	2019-20	2020-21
T-1: Farmer practices	45640	49600	42240	33120	-3400	-16480	0.93	-0.67
T-2: Front line demonstration(FLD)	45640	49300	63360	68544	17720	19244	1.39	1.39

Results and Discussion

The data given in Table 1 reveal that adopted new variety Pusa Basmati 1509 with application of balanced fertilizer under front line demonstration result in substantially higher rice crop grain yield that compared to farmer's practices during the year 2019-20and 2020-21. The average seed yield of rice in first year was 28.80 q/ha and second year average grain yield of rice was 38.08 q/ha under demonstration technology. The average seed yield of farmer's practices in first year was 19.20 q/ha and in second year 18.40 q/ha. Adopted new variety Pusa Basmati 1509 with application of balanced fertilizer under demonstration seed yield of rice 9.60 q/ha first year and 20.40 q/ha second year was obtained more in the comparison to farmer's practices. The higher seed yield of rice under Demonstration in comparison to farmer's practices could be ascribed mainly to the adopted new variety Pusa Basmati 1509 with use of balanced fertilizer dose under front line demonstration.

The similar results of yield enhancement in front line demonstrations have been documented earlier[1, 2,3]. The results clearly indicate the positive effects of FLDs over the existing practices towards enhancing the productivity of rice in Agra district. Despite the lower yield levels in adopted villages Ardaya, Nagariya, Barbar, Chandi, Nagala the newer technologies for production of rice have given a very good result in comparison to farmer's practices. There is a need to adopt FLDs technology that enhancing rice production.

Economics indication i.e. gross cost of cultivation, gross returns, net returns and benefit cost ratio of front line demonstration are presented in **Table 2** which clearly show that gross cost of cultivation for rice under front line demonstration practices during was first year Rs. 45640 and second year Rs. 49300 compare to farmer practices cost of cultivation first year Rs. 45640 and second year Rs 49600. The date clearly revealed that demonstrated of new variety Pusa Basmati 1509 with application of balanced fertilizer provided substantially higher return than local check (farmer's practices) i.e. during 2019-20 and 2020-21. Demonstration under new variety Pusa Basmati 1509 with application of balanced fertilizer show clear income Rs. 17720 and Rs. 19244 compare to farmer practices Rs. -3400 and Rs. -16480, respectively both the year. New variety Pusa Basmati 1509 with application of balanced fertilizer under front line demonstration was more Profitability compared to farmer practices.

Economics analysis of the yield performance revealed B:C ratio 1.39:1 and 1.39:1 compare to -0.93:1 and -0,67:1 farmers practices (Traditional) of year 2019-20 and 2020-21, respectively . Benefit: Cost ratio was recorded to be higher under new variety Pusa Basmati 1509 with application of balanced fertilizer demonstration against control (farmer's practices) during both the years of study.

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