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## Popularization of long duration rice variety Swarna sub-1 through front line demonstrations in Mahrajganj district of Uttar Pradesh, India

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### Abstract

Rice is a Major cereal Kharif crop of Uttar Pradesh as well as the country and plays a major role in augmenting the income of famers of Mahrajganj district of Uttar Pradesh. The major constraints of traditional rice cultivation is low productivity due to non-adoption of recommended package of practices and improved varieties. To overcome this problem Krishi Vigyan Kendra, Mahrajganj conducted Front Line demonstrations in farmer's fields in year kharif 2017 at different locations with high yielding rice variety Swarna sub-1 and applying scientific package of practices in cultivation including line transplanting. The rice productivity and economic returns under improved practices were calculated and compared with the prevailing farmer's practice. Results revealed that rice variety Swarna sub-1 under improved practices recorded higher yield of 19.29 during kharif 2017 than farmer's practice and the recommended practice gave higher net returns of Rs 42449 per ha. And B:C ratio of 2.20 as compared to farmer practice.

**Keywords:** Swarna sub-1, front line demonstrations, scientific package, farmer's practice

### Introduction

Rice crop holds the key for food security of Uttar Pradesh as well as the country. Mahrajganj district has been considered as productive potential region of rice crop due to assured irrigation facilities and favorable soil and climate conditions. In the district rice is grown in an area of 1.66 lac ha. with a production of 4.20 lac tons having productivity of 25.37 q/ha while in UP total area is 59.66 lac ha. with a production of 143.96 lac tons having productivity of 24.13 q/ha (Deptt. of Agric. Mahrajganj 2016-17). Mostly the farmers of this region prefer cultivation of medium-long duration (140-150 days) rice varieties as irrigated and rainfed crop. Swarna Sub-1, BPT -5204, Masuri, Golden etc. are the popular rice varieties mostly grown in the low land area of the district., but among these Swarna Sub- 1 is the predominant variety in rice growing low land area. Swarna Sub-1 has high production potential and also resistant to water logged conditions. It gives yield in submerged water condition up to 12-14 days. Apart from the improved agronomic practices, unawareness of the farmers about the adoption of improved high yielding varieties with improved package of practices are also the reasons responsible for limiting the production and productivity of rice.

Keeping in the view, krishi Vigyan Kendra, Basuli Mahrajganj conducted FLDs to introduce and popularize Rice var. Swarna Sub-1 in the real farm situation.

### Materials and Methods

Front line demonstrations (FLDs) of Rice variety swarna Sub-1 were conducted during kharif 2017 by Krishi Vigyan Kendra, Basuli Mahrajganj at the farmer's fields in different locations of the district. A total no. of 40 demonstrations were conducted in 16.00 ha. Area. The improved variety Swarna Sub-1 seed was procured from Agriculture department of district for demonstration purpose. In case of local check plots, existing practice of transplanting was followed by the farmers. The whole package approach demonstrated to farmers through FLDs included components such as improved variety, line transplanting, recommended seed rate, use of treated seed, weed and water management, fertilizer management and plant protection measures (Table-1). In the demonstration plots critical input as improved seed of Swarna Sub-1 variety was provided to the farmers. Traditional practices were maintained in case of local checks. The farmers involved in demonstrations were facilitated by KVK scientists in performing proper field operations like timely sowing of nursery, spraying of weedicides balance use of fertilizer, irrigations on critical conditions etc. During this period extension activities like field days, framers' trainings, diagnostic visits etc. were done under the supervision of KVK scientists which benefitted the farmers.

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Data on crop yield were recorded by per square meter observation method randomly from 3-4 places and collected from both the demonstrations and farmers' fields and analyzed using simple statistical tools. The technology gap, extension gap and technology index (Samui *et al.*, 2000) [6] were calculated using the following equation.

Technology Gap= Potential Yield-Demonstration yield  
Extension Gap= Demonstration yield – farmer practice yield.

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

## Results and Discussion

The yield of rice recorded under demonstration was 56.34 q/ha. while in Farmer practice was 41.20 q/ha. (Table 2). The yield enhancement due to the improved practices was 19.29% over the farmer's practice in year 2017. Yield enhancement in rice and other crops under Front Line Demonstrations has been documented by Haque (2000) [2], Tiwari and Saxena (2001) [7] Katare *et al* (2011) [3]. Extension gap of 9.11 q/ha. was observed. Extension gap emphasized the need to bring awareness among the farmers for adoption of improved varieties and production technologies and to reverse the trend of wide extension gap. Results also indicated technology gap between the improved technology and farmers' practice in tune of 10.66 q/ha. The technology gap observed may be attributed to differ in soil fertility status and agricultural

practices and may be overcome by adopting efficient management practices. The technology index indicates the feasibility of the improved technology at the farmers' field. Lower the values of technology index, more is the feasibility of the technology demonstrated (Chauhan, 2011) [1]. Technology index in the present study was 15.91 percent showing the efficacy of good performance of technical interventions. The reduction in the technology index exhibits the feasibility of the technology demonstrated. Economic analysis of improved practices indicate that the cost of cultivation in FLDs was equal to the local practice (Table 4). The input and output prices of the commodities prevailing during the study were taken into account for calculating the net returns and B:C ratio. A higher net return of Rs 57481 ha<sup>-1</sup> was recorded as compared to Rs 42449 in farmer's practice. The benefit-cost ratio of rice cultivation under improved cultivation practices was 2.62 as compared to 2.20 under farmers' practice. The benefit-cost ratio was higher due to more yield obtained under improved technologies as compared to farmer's practice. Tiwari and Saxena (2001) [7] and Pandey *et al* (2018) [5] also found in the same way. The data on yield attributes of improved technology indicate that the no of matured panicles (m<sup>2</sup>) and No of filled grain panicles<sup>-1</sup> were 283-294 and 175-196 recorded as compared to 215-223 and 180-187 under farmers practice respectively. Moreover, the test weight (g) was 23.80-24.20 as compared to 22.90-23.40 under farmer practice (Table 3).

**Table 1:** Agrotechniques followed in improved practices and Farmers Practices

Sl. No	Technology	Improved practices	Farmer practice
1.	Variety	Swarna Sub-1	BPT-5204, Masuri, Golden etc.
2.	Land preparation	Ploughing, Harrowing	Ploughing, Harrowing and puddling
3.	Seed rate	40 kg/ha	40 kg/ha
4.	Seed treatment	Carbendazym @ 2.0 g / kg seed	No application
5.	Sowing method	Line transplanting	Random transplanting
6.	Use of herbicide	Bispyribac-sodium 10% SC @ 250ml ha <sup>-1</sup>	Butachlor @ 2.0 lit. ha <sup>-1</sup>
7.	Fertilizer dose	120:60:60 (N:P:K) and ZnSO <sub>4</sub> @ 25 kg ha <sup>-1</sup>	120:60:00 (N:P:K) No use of ZnSO <sub>4</sub>
8.	Plant protection	IPM	Indiscriminate application

**Table 2:** Yield under Demonstration and Farmer practice.

No. of demo./ No. of farmer	Area (ha.)	Grain yield (q/ha.)		% increase over FP	Straw yield (q/ha.)	
		Demo	FP/Local check		Demo	FP
40	16.0	56.34	47.23	19.29	112.68	94.46

**Table 3:** Yield attributing characters

yield attributes	Demonstration	Farmer's practice
No. of matured panicles m <sup>-2</sup>	283-294	215-223
No. of filled grains panicle <sup>-1</sup>	175-196	180-187
Test weigh (g)	23.82-24.20	22.90-23.40

**Table 4:** Economic analysis of rice cultivation (Rs / ha.)

Demonstration				Farmer's practice (control)			
Cost of cultivation	Gross return	Net return	B:C	Cost of cultivation	Gross return	Net return	B:C
35480	92961	57481	2.62	35480	77929	42449	2.20

**Table 5:** Impact of Demonstration as Technology gap, Extension gap and Technology index

Technology gap (q ha <sup>-1</sup> )	Extension gap (q ha <sup>-1</sup> )	Technology index (%)
10.66	9.11	15.91

## Conclusion

The yield potential of rice var. Swarna Sub-1 by conducting Front Line Demonstrations was increased to a great extent by proven technology. This substantially increased the income as

well as the livelihood of the farming community of the Mahrajganj district of Uttar Pradesh. Some of the factors are responsible for constraints in the adoption of Rice var. swarna sub-1. This variety gained a momentum in upscaling the rice

productivity which created a positive impact on farming community.

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