

Impact of frontline demonstrations on line sowing of paddy variety Maheshwari through seed drill in tribal area of Gariyaband district of Chhattisgarh

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ABSTRACT

Paddy is a predominant rainfed Kharif crop and plays a major role in augmenting the income of small and marginal farmers of Gariyaband district of Chhattisgarh. One of the major constraints of traditional paddy cultivation is low productivity due to non-adoption of recommended package of practices and improved varieties. To overcome this anomaly Krishi Vigyan Kendra, Gariyaband conducted frontline demonstrations in farmers' fields of Mahonda village with high yielding variety IGKV R 1244 (Maheshwari) and applying scientific practices in cultivation including line sowing through seed drill. The paddy productivity and economic returns under improved technologies were calculated and compared with the prevailing farmers' practice. Results revealed that Maheshwari variety under improved practices recorded higher yield of 44 and 46.8 q/ha during 2014-15 and 2015-16 and the recommended practice gave higher net returns of Rs 38150 and 44360 per ha and B:C ratio of 2.63 and 2.89 respectively as compared to farmers practice.

Keywords: Frontline demonstration; line sowing; net returns; paddy; seed drill

INTRODUCTION

Rice is the principal crop grown in the state of Chhattisgarh and in Gariyaband district 68.4 per cent of the area is under Kharif rice. Small and marginal farmers constitute almost 71.14 per cent of the total farmers who are dependent on rains. Biasi method of rice cultivation is most widely used by the farmers of Gariyaband district in which maintaining the optimum plant population is a major constraint for achieving higher productivity. Biasi or bueshening is basically a method of broadcasting seeds in dry or wet soils after normal field preparation. The rice plants as well as weeds grow simultaneously up to 30 to 40 days and thereafter ploughing is done in standing rice crop in presence of 5-10 cm of water. It is done by Desi plough. After ploughing the rice plants are put erect and gap filling is done by local transplanting system within 3-4 days of Biasi operation. It is done manually by labourers. But there are several constraints like uneven plant population, high weed population during early growth stage, high mortality rate due to Biasi operation

and late onset or uneven rainfall due to which the farmers are not able to conduct Biasi operation timely resulting in poor productivity. Under these circumstances direct sown paddy with seed drill appears to be a viable alternative for rice cultivation that saves labour and water requirement. So direct seeding is much helpful due to less labour and time requirement. Apart from the sowing techniques unawareness of the farmers about the improved high yielding varieties and adoption of proper package of practices are also the reasons responsible for limiting the production and productivity of paddy. Keeping this in view Krishi Vigyan Kendra, Gariyaband had taken up demonstrations to introduce and popularize sowing of Maheshwari variety of paddy through seed drill over the traditional Biasi method of rice cultivation.

MATERIAL and METHODS

Frontline demonstrations (FLDs) in rice were conducted during Kharif 2014 and 2015 by Krishi Vigyan Kendra, Gariyaband at the farmers' fields of

Mohanda village. A total of 22 demonstrations in 8.8 ha area were conducted in the selected village. The improved variety Maheshwari was procured from Indira Gandhi Krishi Vishwa Vidhyalaya, Raipur for demonstration purpose. In case of local check plots, existing practice of direct seeding through broadcasting followed by Biasi was followed by the farmers. The whole package approach demonstrated to farmers through FLD trials included components such as improved variety, line sowing through seed drill, recommended seed rate, seed treatment, weed and water management, fertilizers and plant protection measures (Table 1). In the demonstration plots a few critical inputs in the form of improved seed of Maheshwari variety and balanced fertilizers were 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 through seed drill, spraying and harvesting. During this period extension activities like field days, farmers' trainings, diagnostic visits etc were undertaken which benefitted the farmers. Data on crop yield were recorded by per square meter observation method randomly from 3 to 4 places from an acre. The yield data were collected from both the demonstrations and farmers' fields and analysed using simple statistical tools. The technology gap, extension gap and technology index (Samui et al 2000) were calculated using the following equation:

Technology gap= Potential yield - demonstration yield

Extension gap= Demonstration yield – farmers' practice yield

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

RESULTS and DISCUSSION

The yield of paddy recorded under demonstration was 44 and 46.8 q/ha during 2014-15 and 2015-16 respectively (Table 2). The yield enhancement due to the improved practices was to the tune of 34.1 and 36 per cent over farmers' practice. Yield enhancement in rice and other crops under frontline demonstration has amply been documented by Haque (2000) and Tiwari and Saxena (2001).

Extension gap of 11.2 and 12.4 q/ha was observed during 2014-15 and 2015-16. Extension gap

emphasized the need to bring awareness among the farmers for adoption of improved varieties and production technologies and to revert the trend of wide extension gap. Results also indicated technological gap between the improved technology and farmers' practice in tune of 6 and 3.2 q/ha during 2014-15 and 2015-16 respectively. The technology gap observed may be attributed to difference in soil fertility status and agricultural practices and may be overcome by adopting efficient management practices.

The technology index indicates the feasibility of the evolved technology at the farmers' fields. Lower the values of technology index more is the feasibility of the technology demonstrated (Chauhan 2011). The technology index in the present study was 10.91 and 5.82 per cent showing the efficacy of good performance of technical interventions. The reduction in the technology index from 10.91 per cent in the first year to 5.82 per cent in the second year exhibited the feasibility of the technology demonstrated.

The data on economics of the improved technology indicate that the cost of production in FLD was higher than that of the local practice (Table 3). 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 38150 and 44360 per ha was recorded during both the years as compared to Rs 24920 and 28630 achieved as net returns in the farmers' practice. The benefit-cost ratio of paddy cultivation under improved cultivation practices was 2.63 and 2.89 during both the years as compared to 2.19 and 2.35 under farmers' practice. This may be due to higher yield obtained under improved technologies as compared to farmer's practice.

CONCLUSION

The yield potential of paddy cultivation increased to a great extent by conducting frontline demonstrations of the proven technologies. This substantially increased the income as well as the livelihood of the farming community. Some of the factors constraining the full adoption of direct sown paddy through seed drill were timely availability of seed drill, lack of land levelling and skill in operating seed drill. If the farmers overcome these constraints this technique will make remarkable performance than the traditional method. This

Table 1. Comparison between demonstration package and farmers' practice in paddy cultivation

Parameter	Demonstration package practice	Farmers' practice
Variety	Maheshwari	MTU 1010
Seed rate	60 kg/ha	100 kg/ha
Seed treatment	Carbendazim + mancozeb (2 g/kg seed)	Not applied
Sowing method	Line sowing through seed drill	Broadcasting/Biasi
Fertilizer dose	100:60:40 (N:P:K kg/ha)	Imbalanced use
Plant protection measures	Need-based spray of pesticides	No use of pesticides

Table 2. Yield, technology gap, extension gap and technology index of paddy variety Maheshwari under FLD

Year	Area (ha)	Number of FLDs	Yield (q/ha)		Extension gap (q/ha)	Technology gap (q/ha)	Technology index (%)
			FLD	Farmers' practice			
2014-15	4.8	12	44	32.8	11.2	6	10.91
2015-16	4	10	46.8	34.4	12.4	3.2	5.82

Table 3. Economics of paddy under frontline demonstration

Parameter	2014-15		2015-16	
	Improved practice	Farmers' practice	Improved practice	Farmers' practice
Cost of cultivation (Rs/ha)	23450	21000	23500	21250
Gross return (Rs/ha)	61600	45920	67860	49880
Net return (Rs/ha)	38150	24920	44360	28630
B:C ratio	2.63	2.19	2.89	2.35

method gained a momentum in upscaling the paddy productivity which created a positive impact on farming community.

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