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Impact of frontline demonstrations (FLDs) on participatory seed production of rice among scheduled caste farmers of Bishnupur district, Manipur, India

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ABSTRACT

One of the main reasons for low productivity of crops is unavailability of reliable quality seeds in the local markets. Use of quality seeds alone can enhance the crop productivity by 15-25 per cent. Considering the importance of quality seeds of rice, KVK, Bishnupur, Manipur conducted frontline demonstrations (FLDs) through participatory seed production of rice var RC-Maniphou-13 in kharif season at adopted farmers' fields in Leimaram village, district Bishnupur, Manipur during 2017-18. The study was carried out to demonstrate the production and economic benefit of adopting improved technologies through line transplanting at 25 x 10 cm spacing in the fields of 20 adopted farmers' fields covering an area of 10 ha. Impact assessment recorded higher yield as well as higher economic return as compared to the farmers' local practices. The demonstration of technologies gave higher yield of 58 q/ha with 15.51 per cent increase in average yield over farmers' local practices. The study also registered higher gross return, net return with higher benefit-cost ratio in the demonstration fields as compared to farmers' local practices.

Keywords: FLD; farmers' practices; seed; rice; gap; improved technologies

INTRODUCTION

In India for more than two-third of the populace, rice is considered as the most important and grown extensively food crop. During the period 1950-51 to 2001-2002 the area has increased by one and a half time (31.0 to 44.6 million hectares), productivity by three times (668 to 2,086 kg/ha) and production by four and half time (20.58 to 90 million tonnes) (Mishra 2005). By 2020 at the current rate of inclining in population growth the projected demand for rice is 125 million tonnes (Meena et al 2018).

Rice (*Oryza sativa* L) has not only been the staple food of northeastern India but has also shaped the culture, diet, economy and livelihood of the majority of the northeastern Manipur. Its production primarily depends on innovative package of practices and the most consistent and the highest yields of the crop can be harvested in irrigated systems (Singha and Mishra 2015). Innovative package of practices includes the effective fertilization, water and weed management, lower plant densities and sustainability of the farmers (Anon 2006, Hossain 1998). The main reasons responsible for decline in productivity of rice are meagre investment on proper irrigation strategies, technological absence to reduce abiotic and biotic maladies, invasive mushrooming of weeds that cause substantial destruction in standing crop, no use of improved varieties, lack of quality seed of improved varieties, cultivation on less fertile soils, rainfed and marginal lands, imbalanced use of nutrients, lack of integration of nutrient supply sources and adverse impact of weather aberrations on crops (Singha and Mishra 2015). The innovative package of practices of rice is generally neglected by the farmers completely in all respects. As such there always appears to be a gap between the recommended agricultural technologies by the scientists or researchers and their modified form at the farmers' level. The technological gap is thus the major obstruction in the efforts of inclining agricultural production in the Bishnupur district of Manipur. The need of the day is to minimise the technological gap between the innovative package of practices recommended by the scientists and its appreciation by the scheduled caste farmers of Bishnupur on their field (Meena et al 2018). Quality seed is an important input for increasing agricultural productivity (Nag et al 2015). In general the productivity of rice crop in Bishnupur district was low because of least technological backup, small and marginal landholdings and poor adoption of improved package of practices. Therefore efforts were made through frontline demonstrations (FLDs) to introduce innovative package of practices of rice with a view to increase its productivity in the district.

Technology gap, extension gap and technology index were measured as per the formulae given as under:

Technology gap= Potential yield - Demonstration yield

Extension gap= Demonstration yield - Farmers' yield

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

MATERIAL and METHODS

The present study was carried out through frontline demonstrations (FLDs) on participatory seed production of rice var RC-Maniphou-13 by the Krishi Vigyan Kendra, Bishnupur, Manipur in kharif season at adopted farmer's fields in Leimaram village, Bishnupur district during 2017-18 to demonstrate the production and economic benefit of adopting improved technologies through line transplanting with 25 x 10 cm spacing in each of the 20 adopted farmers' fields covering an area of 10 ha. The improved technologies included modern varieties, seed treatment, maintenance of optimum plant population etc. The fertilizers were given as per improved practices as basal dose. Pest and disease management was done routinely. The crops were harvested at perfect maturity stage with suitable method. In demonstration plots critical inputs in the form of quality seed and treatment, farm manure, balanced fertilizers and agro-chemicals were provided by KVK, Bishnupur. The technology gap, extension gap and technology index were calculated as suggested by Samui et al (2000).

RESULTS and DISCUSSION

Yield

The high, low and average yield in the demonstration plots was 65, 55 and 58 q/ha respectively as compared to 42 q/ha in farmers' practice (Table 1). Similar observations were made by Poonia and Pithia (2011).

Technology gap

The technology gap in the demonstration yield over potential yield (5.3 tonnes/ha) was 8 q/ha. The technology gap may be attributed to the dissimilarity in the soil fertility status and weather conditions (Mukherjee 2003). Hence variety-wise location-specific recommendation appears to be necessary to minimize the technology gap for yield level in different situations (Rachhoya et al 2018).

Extension gap

The highest extension gap of 16 q/ha was recorded. This emphasized the need to educate the farmers through various means for the adoption of improved agricultural production technologies to reverse this trend of wide extension gap. More and more use of latest production technologies with high yielding varieties would subsequently change this alarming trend of galloping extension gap. The new technologies would eventually lead to the farmers to discontinue the old technologies. This finding is in corroboration with the findings of Hiremath and Nagaraju (2010).

Technology index

The technology index shows the feasibility of the evolved technology at the farmers' fields and lower the value of technology index more is the feasibility of the technology (Jeengar et al 2006). The technology index was 8.6 per cent.

The input and output prices of commodities prevailed during the study of demonstrations were taken for calculating gross return, cost of cultivation, net return and benefit-cost ratio. The cultivation of rice var RC-Maniphou under improved technologies gave

Table 1. Yield, economics, technology gap, extension gap and technology index of the frontline demonstrations

Crop enterprise	Technology demonstrated	Demonstration yield (q/ha)			Local check yield (q/ha)	% increase/change in average yield over local check	Gross cost (Rs/ha)/(Rs/unit)	Gross return (Rs/ha)/(Rs/unit)
		H	L	A				
Rice var RC Maniphou-13	Spacing: 25 x 10 cm	65	55	58	42	15.51	45,000	1,16,000
Farmers' practice: direct seeding method	-	-	-	-	-	-	35,000	84,000

Table 1 contd…..

Crop enterprise	Net return (Rs/ha)/(Rs/unit)	B:C (GR/GC)	Technology gap (q/ha)	Extension gap (q/ha)	Technology index (%)
Rice var RC Maniphou-13	43,840	1.97:1	8.0	16.0	8.6
Farmers' practice: direct seeding method	26,600	176.1	-	-	-

H= High, L= Low, A= Average, GR= Gross return, GC= Gross cost; Technology gap over potential yield 5.3 tonnes/ha

higher net return of Rs 43,840/ha as compared to farmers; practice (Rs 26,600/ha). The benefit-cost ratio under improved technologies was 1.97:1 as compared to 1.76:1 under farmers' practice. This may be due to higher yields obtained under improved technologies compared to local check (farmers' practice). Same observation was made of Islam et al (2011).

CONCLUSION

The impeding factors on advocacy of well proven agricultural technology are the small size of holdings and poor farm resources. Less capability to take risk and do not dare to invest in the costly input due to high risk and the poor purchase capacity of small farmers are the unproductive attitudes of small and marginal farmers. Application of indigenous unscientific implements and tools are still in practice due to small holdings which have poor working efficiency. The lack of simple modern tools for small holding also hinders the adoption of improved technology. The demonstration of technologies gave higher yield of 58 q/ha in an average with 15.51 per cent increase in average yield over farmers' local practice. Technology and extension gap were extended which can be bridged by adopting package of practices with emphasis on improved variety, use of proper seed rate, balance nutrient application and proper use of plant protection measures. Replacement of local variety with the released variety of rice would increase the production and net income by more than fifty three thousand rupees.

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