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Impact of front line demonstration over traditional farmers practice on short duration paddy

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Abstract

Krishi Vigyan Kendra Kurukshetra has conducted Front line demonstration (FLD) on short duration paddy (PB-1509) to compared the differences of yield and economic with traditional farmer practices in different villages of Kurukshetra. In demonstrated field farmer grow paddy by fallowing the guidelines of Package of Practices published by CCS Haryana Agricultural University; Hisar whereas, the traditional paddy growing methods was applied by other farmers with local variety. After comparison of yield and economic of both the treatment i.e., demonstrated field and traditional farmers practices, it was found the yield and net income in front line demonstrated field was found higher than the traditional farmers practices. Lower yield and higher expenditure in traditional practices was due to the farmers used local variety, apply over doses of fertilizers, expend more cost in controlling pesticides etc.

Keywords: Paddy Yield, Front Line Demonstration, Traditional Farmer Practices, Economics

Introduction

Rice (*Oryza sativa*) belongs to the family Poaceae cultivated in Indo-Gandetic plans with high quality characters and good aroma. India is one of the top exporters of basmati rice, it export about 30-40 % of basmati rice and 60-70 % non-basmati rice to different countries of the world like Iran, Saudi Arabia, Iraq etc. Rice is grown in well irrigated system in 18 districts of Haryana with high to low productivity. High rice productivity districts of Haryana are Kurukshetra, Panchkulla, Fathabad, Ambala, Sirsa, Yamunanagar and Karnal. In Haryana Paddy acreages are estimated 1,350 thousand ha out of which Basmati acreages are estimated 843.4 thousand ha in 2019.

Major paddy growing states includes West Bengal, Uttar Pradesh, Punjab, Andhra Pradesh, Tamil Nadu, Bihar, Orissa and Chhattisgarh in India and contributing about 72 % of total paddy area and 75 % of paddy production. India is still amongst the countries with the lowest paddy yields, 70 % of the all paddy growing districts report yields lower than the national average. Yield gap analysis further reveals that 30 to 40 % of the potential yield is yet to be tapped with available high yielding varieties (HYV) with improved practices. This gap is likely due to use of local varieties, high plant population, endemic pests and diseases, low input use, defective cropping systems and a low adoption rate by farmers of high yielding technologies. Keeping in view the above facts, front line demonstration has conduct at farmer's field to provide all the necessary information to the farmers to grow paddy crop in their field.

Materials and Methods

Krishi Vigyan Kendra, Kurukshetra has conducted 44 front line demonstrations in 17.6 ha area on farmer's field in different villages of Kurukshetra from 2017 to 2019. In front line demonstrated field, short duration high yielding paddy variety (PB-1509) were sown as per guideline mentioned in package of practices (Kharif) published by CCS Haryana Agricultural University, Hisar. Soils condition of Kurukshetra villages were clay loam in texture with low to medium in organic carbon content and other nutrients like Nitrogen, Phosphorous, and Potassium. In front line demonstrated fields; Seeds were sown after seed treatment with Bavistin @ 10 g in 10 liters of water for 10kg seeds and transplant only healthy seedlings in the field. The application of Urea, Single Super Phosphate, micronutrients, recommended weedicide, insecticides etc were applied in paddy field as per information mentioned in Package of Practices. The output data like expenditure, profit, yield etc were collected from farmers grow paddy under demonstrated field as well as farmer grown paddy under traditional farming practices to compare the gap between the technologies. Finally, the Technology gap, Extension gap, Technology index along with B:C ratio were analyzed by the formulas as given by (Katare et al. 2011) and (Samui et al. 2000)

Technology gap = Potential yield – Demonstration yield

Extension gap = Demonstration yield – Farmer's practice yield

$$\text{Technology Index} = \frac{\text{Potential yield} - \text{Demonstration yield}}{\text{Potential yield}} \times 100$$

$$\%\ \text{increase over farmers practices} = \frac{\text{Demonstrated practices} - \text{Farmer practices}}{\text{Farmer practices}} \times 100$$

Results and Discussion

22 Front line demonstration of short duration paddy were shown on farmers field in 8.8ha areas during both the years i.e., 2017-18 and 2018-19 (Table: 1). In demonstration field, farmers follows all the cultural and management practices from nursery sowing of paddy crop to final harvest in their field as mentioned in Package of Practices like use of recommended variety (PB-1509), sowing before seeds treatment with fungicide, timely sowing with healthy seeds in nursery bed (1st week of June), timely transplanting of healthy seedlings (1st week of July) with 2-3 cm deep in soil with the help of transplanting machine, timely application of weedicide to control weed growth and pesticides which harms the paddy crops. (Samant. 2015) concluded that replacement of high yield variety with newly released hybrid will increase the yield of rice and net income of the farmers. All the essential fertilizers were applied after soil testing of demonstrated field like Urea, Single Super Phosphate, Zinc sulphate. After harvest of short duration paddy, 46.2 and 43.8 q/ha yield were recorded in front line demonstration field and 43.6 and 41.2 q/ha in traditional farmers practices field during 2017-18 and 2018-19 respectively. It was recorded that the yield of short duration paddy yield under demonstration field was 5.48 and 6.31 percent higher over traditional farmers practices during 2017-18 and 2018-19 respectively, the result of yield during both the years showed that use of latest technology and other cultural management practices from sowing to final harvest of paddy crop and timely application of irrigation water in the field help to enhance the paddy yield than paddy yield recorded from traditional farmers practices. In demonstration field, yield of short duration paddy was more than traditional farmer practices may be due to the use of recommended variety, seed treatment, recommended chemicals used in plant protection and other practices were timely applied in demonstrated field reported by (Mishra. 2019). In comparisons between demonstrated field paddy yield and traditional farmer's practices paddy yield, the technology gap varied from 8.8 to 11.2, extension gap was 2.6 during both the years. (Beigh et al. 2015) observed that extension and technology gap of the farmers was due to lack of knowledge of improved production practices of paddy crop and this gap can be overcome by conducting of front line demonstration programmes at farmers field which increases the knowledge among the farmers to a significant level. Technology index was varied from 20.7 to 25.1 during 2017-18 and 2018-19 respectively. The feasibility of technology increased if lowers the value of technology index. This gap may be due to the farmers use to grow paddy in their field without soil and water testing before sowing in traditional practices, use of over doses of fertilizers resulted more disease and insects attack of their crop, apply over doses of pesticides, weedicides resulted they expend more cost to control weeds, disease and insects. The gap between potential and demonstration yield of paddy varieties due to the gap between extension and technology. To overcome this gap, educate the farmers in adoption of improved technology through various technology transfer centers reported by (Mandavkar et al. 2012).

Table: 1. Comparison of Yield, % increase over farmers practices, technology gap, extension gap and technology index in short duration paddy variety (PB-1509) between Front Line Demonstration and Farmer's Practices

Year	No. of farmers	Area (ha)	Yield (q/ha)			% increased over farmers practices	Technology Gap	Extension Gap	Technology Index
			PY	DY	FP				
2017-18	22	8.8	55	46.2	43.6	5.48	8.8	2.6	20.7
2018-19	22	8.8	55	43.8	41.2	6.31	11.2	2.6	25.1
Average			**55**	**45.0**	**42.4**	**5.90**	**10.0**	**2.6**	**22.9**

PY- Average Potential yield, DY- Demonstrated Yield and FP- Farmer's Practices

The economics of front line demonstration in farmer field and traditional farmer practices were presented in Table: 2, the average gross cost, gross return and net return was Rs 73921, 118992 and 45071 respectively in front line demonstrated field whereas in traditional farmer practices it was recorded Rs 77190,112408 and 35218 respectively. (Raj *et al.* 2014) suggested that the production of rice yield by replacement of local variety with latest variety of rice resulted increases in net income of the farmer. In traditional farmers practices, farmer expend more money to grow paddy seeds without seed treatment resulted they expend more money in controlling insect-pests moreover, they use overdoses of pesticides in paddy field and use traditional technology to growing paddy crop from sowing to harvest period. Whereas, in demonstration field, farmer sowing the recommended variety after seed treatment and applied prescribed doses of pesticides and weedicides in controlling pests and weeds, applied all the essential fertilizers like Urea, SSP, Zinc Sulphate etc after soil testing resulted they expend less money and also use to grow paddy crop with latest technology form seeds sowing in nursery bed to final harvest stage. Benefit cost (B:C) ratio was recorded 1:37 in demonstrated field and 1.29 in traditional farmers practices during 2017-18 and 2:03 and 1:73 was recorded in demonstrated field and traditional farmers field during 2018-19 respectively this indicated that the Benefit cost ratio was recorded better in demonstration field than traditional farmer practices. (Samant. 2014) reported that cultivation of rice with improved technologies has been found more productive and grain yield and replacement of high yielding variety with newly released hybrid will increase the production and net income of farmers. The gap between demonstrated field and traditional farmer practices was due to the farmers has not followed the full package of practices and latest technology and recommended chemicals and doses of fertilizers, pesticides and weedicides in growing short duration paddy crop from sowing to final harvest period. (Singh et al. 2021) also reported that the farmer using the latest scientific technology and follows the guideline as mentioned in Package of Practices from sowing to final harvest of summer moong like using the improved variety, seed treatment, timely sowing, timely application of weedicide, pesticides and irrigation etc can obtained better quality higher yield and net return. Similar observation is also obtained by (Mamta et al. 2020) and (Singh et al. 2021) in wheat crop.

Table: 2. Gross cost, Gross return, Net return and B:C ratio as affected by improved and traditional farming practices in short duration paddy variety

Year	Economics of demonstration				Economics of Traditional Farmer's practices			
	Gross Cost (Rs)	Gross Return (Rs)	Net Return (Rs)	B:C	Gross Cost (Rs)	Gross Return (Rs)	Net Return (Rs)	B:C
2017-18	94342	129360	35018	1:37	95240	122640	27400	1:29
2018-19	53500	108624	55124	2:03	59140	102176	43036	1:73
Average	**73921**	**118992**	**45071**	**1:70**	**77190**	**112408**	**35218**	**1:51**

Conclusion

Krishi Vigyan Kendra, Kurukshetra has conducted Front line demonstration in farmer's field to compare the yield and net return gap with traditional farmer's practices of growing short duration paddy crop. It was concluded that the growing of recommended variety of paddy in demonstrated field from sowing in nursery beds to final harvest as per guideline mentioned in Package of Practices published by CCS Haryana Agricultural University, Hisar like time of sowing, timely and recommended doses of fertilizers, weedicides, pesticides and use of latest machines to grow paddy crop increase the yield and net income of farmers as compared with traditional farmers practices. The yield and economic gaps of demonstrated field and traditional farmer's practices can be overcome by organizing the trainings at farmer's field and village levels to motivate the farmers to grow the recommended varieties in their field and also too aware the farmers about the latest technologies and various management practices for growing short duration paddy crop.

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