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Research Article

EVALUATION OF SCENTED VARIETY PUSA SUGANDHA-4 OF PADDY THROUGH FLDS IN SIDHI DISTRICT OF MADHYA PRADESH

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Abstract- Sidhi is situated in Kaymore plateau and satpura hills of Madhya Pradesh. Paddy is one of the major kharif crop grown in Sidhi district. Krishi Vigyan Kendra laid down Front Line Demonstration in the year 2010-11 and 2011-12 introducing new, high yielding and scented variety "Pusa Sugandha-4" and applying recommended package and practices in their cultivation. The FLDs were carried out in village "Dainiha" of Sidhi district in supervision of krishi vigyan Kendra agronomy scientist. The productivity and economic returns of paddy in recommended package and practices were calculated and compared with the corresponding farmer's practices (local check). Improved practices gave higher yield as compared to farmer's practices. The improved technology observed higher yield of 33.21 q/ha and 34.00 q/ha in the year 2010-11 and 2011-12, respectively than 19.13 and 20.21 q/ha. The average yield increase was observed 41.48 per cent. In spite of increase in yield of paddy, technology gap, extension gap and technology index existed. The improved technology gave higher gross return (39852 & 40800 Rs./ha), net return (19652 & 20600 Rs./ha) with higher benefit cost ratio (1.97 & 2.02) as compared to farmer's practices. The variation in percent increase in the yield was observed due to the poor management practices, lack of knowledge and poor socio economic status. Under sustainable agricultural practices, with this study it is concluded that the FLDs programmes were effective in changing attitude, skill and knowledge of improved package and practices of HYV of paddy adoption.

Keywords- Scented Paddy, FLDs, Economic impact, Adoption, B:C ratio.

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Introduction

Paddy (*Oryza sativa* L.) is the staple food for over half the world's population. It provides 27 per cent of dietary energy and 20 per cent of dietary protein in the developing countries. This crop is grown in about 114 most developing countries and it is the primary source of income and employment for more than 100 million household in Asia [1]. Almost 90 per cent of the paddy is grown and consumed in Asia [2]. India is second largest paddy producer in world followed by China. Worldwide paddy is grown on about 145 million hectares with a production of 600 million tones, in India area under paddy cultivation is from 38 to 43 million hectares with a productivity of 2.6 ton/ha only [3]. Selection of proper variety and agronomic practices can play a vital role in increasing productivity.

Krishi Vigyan Kendra an innovative science based institution that plays an important role in bringing the research scientists face to face with farmers. The main aim of Krishi Vigyan Kendra is to reduce the gap between generation of technology at the research institution and its transfer to the farmers for increasing productivity and income from the agriculture and allied sectors on sustained basis. KVKs are grass root level organizations meant for application of technology through assessment, refinement and demonstration of proven technologies under different micro farming situation at district level [4]. Front line demonstration is a long term educational activity conducted in a systematic manner at farmer's field to worth of new practices/ technology. Farmers in India are still producing crops based on the knowledge transmitted to them by their fore fathers leading to a grossly unscientific agronomic, nutrient management and pest management practices. As a result of these, they often fail to achieve the desired potential yield of various crops and new varieties. The baseline survey was conducted by Krishi Vigyan Kebdra and it was found that farmers were using old varieties without proper use of chemical fertilizers, herbicides and pesticides. Keeping in view the constraint, Krishi Vigyan Kendra, Sidhi conducted front line demonstration on paddy variety Pusa Sugandha-4 with crop management practices under rain fed condition.

Materials and Methods

Front line demonstrations (FLDs) on paddy variety Pusa Sugandha-4 were conducted by Krishi Vigya Kendra, Sidhi (M.P.) during the period from 2010-11 and 2011-12 in village Dainiha of district Sidhi. The total 10 number of demonstrations were conducted in this village. In general, soil of the village under study was sandy loam with low to medium fertility status. The components for demonstration in front line demonstration on paddy was comprised i.e. improved variety Pusa Sugandha-4, proper tillage, proper seed rate and sowing method, balance dose of fertilizer (100:60:40:25 (N:P:K:Zn)), use of PSB @ of 5g/kg of seed as seed treatment, proper irrigation, weed management and protection measure [Table-1]. The total 08 ha area was covered in two consecutive years. In the demonstration, one control plot was also kept where farmers practices was carried out. The FLDs was conducted to study the technology gap between the

potential yield and demonstrated yield, extension gap between demonstrated yield and yield under existing practice and technology index. The yield data were collected from both the demonstration and farmers practice by random crop cutting method and analyzed by using simple statistical tools. The technology gap, extension gap and technological index [7] were calculated by using following formula as given below-

$$\text{Percent increase yield} = \frac{\text{Demonstration yield-farmers yield}}{\text{Farmers yield}} \times 100$$

Technology gap= Potential yield-Demonstrated yield

Extension gap= Demonstrated yield – Yield under existing practice

$$\text{Technology index} = \frac{\text{Potential yield -Demonstrated yield}}{\text{Potential yield}} \times 100$$

Results and Discussion

The gap between the existing and recommended technologies of paddy in district Sidhi was presented in [Table-1 & 3]. Full gap was observed in case of use of HYVs, sowing method, seed treatment and weed management and partial gap was observed in fertilizer dose and plant protection measure, which definitely was the reason of not achieving potential yield. Farmers were not aware about recommended technologies. Farmers in general used local or old-age varieties instead of the recommended high yielding resistant varieties. Unavailability of seed in time and lack of awareness were the main reasons. Farmers followed broadcast method of sowing or old days (25-30 days) seedlings of paddy and closer spacing (10-15 cm) against the recommended line sowing, newly seedlings (15-20 days) and proper spacing (15-20 days) and because of this, they applied higher seed rate than the recommended.

Yield

During two years of frontier technologies results obtained are presented in [Table-2].

Table-1 *Differences between technological intervention and farmers practices under FLDs in paddy*

S. No.	Particulars	Technological intervention	Existing practices	Gap
1	Variety	Pusa Sugandha-4	Old and degenerated	Full gap
2	Land preparation	Three ploughing	Three ploughing	Nil
3	Seed rate	10 kg/ha	100 kg/ha	Higher seed rate
4	Sowing Technique	Transplanting	Broadcasting	Full gap
4	Seed treatment	*PSB* powder@ 5g/kg of seed	No seed treatment	Full gap
5	Fertilizer dose	100:60:40:25 (N:P:K:Zn)	60:30:0:0 (N:P:K:Zn)	Partial Gap
6	Weed management	Butachlor @ 1.5 l/ha	No weeding	Full gap
7	Plant protection	Need based plant protection measure	No plant protection	Full gap

Table-2 *Yield and yield attributing character of paddy variety Pusa Sugandha-4 under FLDs*

Year	Variety	Trial No.	Area (ha)	Average yield (q/ha)		Per cent increase in yield	No. of Panicle/hill	
				Trial	Farmers practice		Trial	Farmer's Practice
2010-11	Pusa Sugandha-4	10	4.0	33.21	19.13	42.39	28.2	13.3
2011-12	Pusa Sugandha-4	10	4.0	34.00	20.21	40.56	36.0	18.0
Total/ Average	-	20	8.0	33.61	19.67	41.48	32.1	15.65

The results revealed that the FLDs on paddy an average yield was recorded 33.61 q/ha under demonstrated plots as compare to farmers practice 19.67 q/ha. The highest yield in the FLDs plot was 33.61 q/ha and in farmers practice 20.21 q/ha during 2011-12. This results clearly indicated that the higher average grain yield in demonstration plots over the years compare to local check due to knowledge and adoption of full package of practices i.e. appropriate varieties such as Pusa Sugandha-4, timely sowing, proper spacing, seed treatment with PSB @ 5g/kg of seed, use of balanced dose of fertilizer (100:60:40:25 (N:P:K:Zn)), method and time of sowing, timely weed management and need based plant protection. The average yield of paddy increased 41.48 per cent. The yield of paddy could be increased over the yield obtained under farmers practices (use of non-descriptive local variety, no use of the balanced dose of fertilizer, untimely sowing and no control measure adopted for pest management) of paddy cultivation [3].

Technology gap

The technology gap, the differences between potential yield and yield of demonstration plots were 26.79 and 26.0 q/ha during 2010-11 and 2011-12 respectively. On an average technology gap under two year FLDs programme was 26.39 q/ha. The technology gap observed may be attributed to dissimilarity in the soil fertility status, agricultural practices and local climatic situation.

Extension gap

Extension gap of 14.08 and 13.79 q/ha was observed during 2010-11 and 2011-12 respectively. On an average extension gap was observed 13.94 q/ha which emphasized the need to educate the farmers through various extension means i.e. front line demonstration for adoption of improved production and protection technologies, to revert the trend of wide extension gap. More and more use of latest production technologies with high yielding varieties will subsequently change this alarming trend of galloping extension gap.

Technology index

The technology index shows the feasibility of the demonstrated technology at the farmers field. The technology index varied from 44.65 and 43.33 per cent [Table-3]. On an average technology index was observed 43.99 per cent during the both the years of and FLDs programme, which shows the efficacy of good performance of technical interventions. This will accelerate the adoption of demonstrated technical intervention to increase the yield performance of paddy.

Economic return

The inputs and outputs prices of commodities prevailed during the study of demonstration were taken for calculating net return and benefit: cost ratio [Table-4]. The cultivation of paddy under improved technologies gave higher net return Rs. 19652 and 20600 per ha in 2010-11 and 2011-12 respectively as compared to farmers practices. [5]. The benefit: cost ratio of paddy cultivation under improved cultivation practices were 1.97 and 2.02 as compared to 1.85 and 1.95 under farmer's practice. This may be due to higher yield obtained under improved technologies compared to farmer's practice [6].

Table-3 *Technology & Extension gap and Technological Index of paddy variety Pusa Sugandha-4 under FLDs*

Year	Variety	Trial No.	Area (ha)	Technology gap (q/ha)	Extension gap (q/ha)	Technological index (%)
2010-11	Pusa Sugandha-4	10	4.0	26.79	14.08	44.65
2011-12	Pusa Sugandha-4	10	4.0	26.00	13.79	43.33
Total/ Average	-	20	8.0	26.39	13.94	43.99

Table-4 *Economic Impact of paddy variety Pusa Sugandha-4 under FLDs*

Year	Variety	Trial No.	Area (ha)	Gross Income (Rs./ha)		Net Return (Rs./ha)		B:C Ratio	
				Trial	Farmers practice	Trial	Farmer's Practice	Trial	Farmer's Practice
2010-11	Pusa Sugandha-4	10	4.0	39852	22956	19652	10556	1.97	1.85
2011-12	Pusa Sugandha-4	10	4.0	40800	24252	20600	11852	2.02	1.95

Conclusion

The FLD produces a significant positive result and provided the researcher an opportunity to demonstrate the productivity potential and profitability of the latest technology (Intervention) under real farming situation, which they have been advocating for long time. This could be circumvent some of the constraints in the existing transfer of technology system in the district, Sidhi of Madhya Pradesh. The productivity achieved in FLD over existing practices of paddy cultivation created greater awareness and motivated the other farmers to adopt suitable production technology of paddy in the district. The constraints faced by the farmers were different for different technologies. Efforts should, therefore, be made by the extension agencies in their transfer of technology programmes to consider the constraints as perceived by the farmers in this investigations as well as personal. Therefore, for enhancing the production & productivity of paddy crop, strategy should be made for getting the more and more recommended technologies adopted by the farmers.

Conflict of Interest: None declared

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