Gujarat Journal of Extension Education Vol. 34 : Issue 2 : December 22 *https://doi.org/10.56572/gjoee.2022.34.2.0027*

IMPACT OF FRONTLINE DEMONSTRATIONS IN TRANSFER OF TECHNOLOGY FOR MANAGEMENT OF PADDY LEAF FOLDER

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ABSTRACT

The present study was conducted to popularize the recommended practice for the management of paddy leaf folder through frontline demonstrations in Panchmahal district of central Gujarat. Results indicated that application of insecticide in recommended practices, i.e., indoxacarb 15.8 EC @ 0.015 per cent (79 g a.i./ha) was found most effective in managing leaf folder as compared to farmers practices. Demonstration plots recorded minimum mean pest infestation (0.38 larvae/hill) and higher yield (39.50 q/ha) as compared to farmers practices recorded higher pest infestation (1.44 larvae/hill) and lower yield (32.50 q/ha). The percentage increased in the yield over farmer's practices was computed to be 21.54 %. Results of study on economic analysis of the yield performance revealed that the recommended practices recorded appreciable higher gross returns (` 71,100/ha) and net return (` 32,000/ha) with higher benefit cost ratio (1.82) as compared to farmer's practices (1.52). The technology gap (10.50 q/ha), extension gap (7.00 q/ha) and the technology index values (21.00 %) were recorded. Frontline demonstrations brought out that the recommended practice was feasible and economically viable over farmers practice and was a better option to adopt for managing paddy leaf folder.

Keywords: *cnaphalocrocis medinalis,* indoxacarb, demonstrations, paddy

INTRODUCTION

Rice (*Oryza sativa* L.) is cultivated in the most diverse ecosystems of tropical and subtropical regions of the world. Out of the eight species of leaf folder attacking rice, the most wide spread and important one is *Cnaphalocrocis medinalis* (Guenee) [Pyralidae: Lepidoptera] which attack rice in different crop growth stage (Arshad *et al*. 2012*). C. medinalis* considered earlier as a pest of minor importance have increased in abundance and have become a major pest in many parts of the world. Paddy leaf folder attained the major pest status in some important rice growing areas of India. This pest is the most widely distributed and found foliage feeder in paddy. Second instar leaf folder larva glues the growing rice leaves longitudinally and feeds the green foliage voraciously which results in papery dry leaves. Larval feeding results in stunting, curling or yellowing of plant green foliage. The damage is more noticeable during active tillering to booting stage. In certain extend, *C. medinalis* causes 63 to 80 per cent yield losses in rice (Nayak *et al*. 2017). An increase in leaf folder population could be practiced to the large scale cultivation of high yielding varieties, excessive usage of nitrogenous fertilizers and continuous use of insecticides that created resistance against this pest. Use of chemical insecticides is one of the most common and popular method of its management. Present studies were undertaken to demonstrate the efficacy of indoxacarb 15.8 EC @ 0.015 per cent (79 g a.i./ha), indoxacarb is insecticide of oxadiazine group, which effectively controls leaf folder by its contact and stomach poison action under real farm conditions. In view of the above factors, frontline demonstrations were undertaken in a systematic manner on farmers' field to show the worth of recommended technology and convince the farmers to adopt the same.

OBJECTIVE

To know the impact of frontline demonstrations in transfer of technology for management of leaf folder, *Cnaphalocrocis medinalis* (Guenee) in paddy crop.

METHODOLOGY

The field experiments were carried out during the *Kharif* season of 2018-19 to demonstrate the efficacy of indoxacarb 15.8 EC @ 0.015 per cent (79 g a.i./ha) in the control of the rice leaf folder under FLD activity of ICAR-Krishi Vigyan Kendra Panchmahal (Gujarat) at farmer's field. Twelve innovative and receptive farmers from taluka Kalol were selected for conducting the demonstrations to ensure their active participation. Indoxacarb 15.8 EC @ 0.015 per

cent (79 g a.i./ha) was used as a recommended pesticide to control the leaf folder while the existing farmers practice used unsystematic spray of quinalphos 25% EC were treated as control for comparison. The farmers usually tend to give higher than the recommended dose. Experimental trial was conducted by following all standard and recommended packages of practices such as tillage, spacing, irrigation and disease control for cultivation of the crop. The insecticides were sprayed with the help of knapsack sprayer when the attack of leaf folder reached two larvae per plant. Observation on population buildup of rice leaf folder was recorded on ten randomly selected hills from each practice. These plants observed regularly at weekly interval. Larval populations in leaves were counted per hill starting from the transplanting till the harvesting of crop.

Production and economic data of recommended practices for front line demonstrations and farmers' practices were collected. In the present study, technology gap, extension gap and technology index were calculated using the formula given by Samui *et al*. (2000).

Technology gap = Potential yield - Demonstration yield;

Extension gap= Demonstration yield –Yield under existing practice;

Technology index = Potential yield – Demonstration yield/ Potential yield ×100.

Statistical analysis

The data collected were transformed into square root values as per the standard requisites. The experiments were subjected to statistical scrutiny following the method of Panse and Sukhatme (1989) and the means were compared with Least Significant Difference (L.S.D.).

RESULTS AND DISCUSSION

Performance of FLD

A comparison of frontline demonstrations due to recommended technology and farmers practice were analyzed and presented in table 1.

Table 1 : *C. medinalis* population, yield attributes, technology gap and technology index of demonstration

Variables	No. of larvae /hill	Yield (q/h)	Yield increase (%)	Technology gap (q/h)	Extension gap (q/h)	Technology index (%)
Farmer's practice	1.44 (2.24)	32.50				
Recommended practice*	0.38 (1.64)	39.50	21.54	10.50	7.00	21.00
S.E±	(0.03)					
CV	(3.51)					
LSD (P = 0.05)	(0.08)*					

*Foliar spray of indoxacarb 15.8 EC @ 0.015 per cent (79 g a.i./ha)
Figures in parenthesis are transformed values of √x+1

Of the two practices, recommended practice i.e. use of indoxacarb 15.8 EC @ 0.045 % was found to be the most effective in managing leaf folder over farmers practice. From the present investigation, it can be concluded that the infestation of leaf folder commenced from 2nd week of August. The leaf folder infestation increased and gradually reached peak of its activity was observed in the 3rd week of September. The two sprays were taken for the management of leaf folder. The data on the larval population of leaf folder after first and second spray revealed that recommended practice recorded significantly lower mean leaf folder infestation. The highest mean leaf folder infestation was recorded in farmers' practices. Leaf folder infestation varied from 0.38 (recommended practices) to 1.44 (farmers practices) larvae population per hill. In the present study, recommended practices found effective in bringing down the paddy leaf folder.

These findings are in close agreement with Sharma and Raju (2018) and Khajuria *et al.* (2021a) reported that per cent mortality of *C. medinalis* by spray of indoxacarb 14.5 SC @ 125 g a.i./ha was found significantly superior to control. The yield performance of recommended practice was 39.50 q/ha which is almost 21.54 % higher than farmers practice (32.50 q/ha). Yield enhancement in paddy crop in evaluation of insecticides has been documented by Sharma and Raju (2018) who obtained significantly the highest yield from indoxacarb sprayed plots and gave satisfactory control of paddy leaf folder.

From these results, it is evident that the recommended practice was found better than the farmers practices under local conditions. Farmers were motivated by results of technologies applied in the front line demonstrations trials and it is expected that they would adopt this technology in the coming years. Yield of the front line demonstration trials and potential yield of the crop was compared to estimate the yield gaps which were further categorized into technology index.

The technology gap shows the gap in the demonstration yield over potential yield and it was 10.50 q/ha. The frontline demonstrations were laid down under the keen supervision of KVK specialist at the farmer's field; there exist a gap between the potential yield and demonstration yield. The observed technology gap may be attributed to dissimilarities in soil fertility, salinity, erratic rainfall and vagaries of weather conditions in the region. Hence, to narrow down the gap between the yields of diverse varieties, location specific recommendation appears to be necessary. These findings are similar to the findings of Rai *et al.* (2017), Rai *et al.* (2018) and Rai *et al.* (2020) in case of various crops.

Technology index shows the feasibility of recommended practices at the farmer's field. The lower the value of technology index more is the feasibility of practices. Result of study depicted in table 1 revealed that the technology index values were 21.00 %. The results of the present study are in consonance with the findings of Khajuria *et al.* (2016a) and Khajuria *et al.* (2021b).

The economics of paddy production under front line demonstrations were estimated and the results have been presented in table 2.

Table 2 : Economics of frontline demonstrations

Variables	Cost of cultivation (₹/h)	Gross return (₹/h)	Net return (₹/h)	Benefit cost ratio
Farmer's practice	38,400	58,500	20,100	1.52
Recommended practice	39,100	71,100	36,000	1.82
Additional in recommended practice	700	12,600	15,900	18.00*

*Incremental benefit cost ratio

Economic analysis of the yield performance revealed that front line demonstrations in recommended practices recorded higher gross returns (₹ 71,100/ha) and net return (₹ 32,000/ha) with higher benefit cost ratio (1.82) as compared to farmers practices (1.52). These results are in accordance with the findings of Khajuria *et al.* (2017) and Khajuria *et al.* (2020). Further, additional cost of ` 700/ha in demonstration has acquired additional net returns ₹ 15,900/ha with incremental benefit cost ratio 18.00 suggesting its higher profitability and economic viability of the demonstration. Similar results were also reported by Khajuria *et al.* (2016b).

CONCLUSION

Outcome of the frontline demonstrations clearly brought out that the adoption of recommended practice indoxacarb 15.8 EC @ 0.015 per cent (79 g a.i./ha) is feasible, economically viable and effective technology for management of paddy leaf folder. The demonstration could convenience most of the farmers to use recommended technology on account of its obvious advantages and effective management of paddy leaf folder. These innovative practices showed solving the farmer's problem, decision-making and ability to modify their farming practices. It is suggested that location specific recommended practice would be needed to bridge the productivity gap of the crop grown in the district.

CONFLICT OF INTEREST

No conflict of interest among researchers.

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Received : October 2022 : Accepted : December 2022