



# New Insecticide Proved Very Effective for Management of Leaf Folder in Paddy

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## ABSTRACT

An On Farm trial (OFT) was conducted during *Kharif* 2019-20 and 2020- 21 seasons at the farmers' field to manage the leaf folder, *Cnaphalocrocis medinalis* through conventional and newer insecticides in rice. Three treatments assessed were T1-Farmer's practice (Chloropyriphos 20 EC @ 2 ml/l), T2- Monocrotophos 36 WSC @ 1.5 ml/l of water (recommended) and T3 -Flubediamide 480 SC (Fame) @ 0.3 ml/l (New Intervention). The results revealed that use of Flubediamide 480 SC (Fame) @ 0.3 ml/l of water was observed to be superior which resulted in 64.86 per cent reduction in damage to leaves of Paddy and increased the grain yield to an extent of 43.18 per cent over farmers' practice (Chloropyriphos 20 EC @ 2 ml/l of water) followed by Monocrotophos 36 WSC @ 1.5 ml/l of water. In terms of cost benefits Flubediamide 480 SC was proved to be the best. Therefore, the use of Flubediamide 480 SC @ 0.3 ml./lt. of water can be recommended for control of leaf folder in paddy.

**Key Words:** Leaf folder, On Farm Trial, Flubediamide, Chloropyriphos, Monocrotophos.

## INTRODUCTION

Rice (*Oryza sativa* L) is one of the important cereal crops, being the staple food for more than 65 per cent of the world population (Sudhikumar *et al*, 2009). The productivity of rice is threatened by a number of insect pests attacking the crop from nursery to harvest, causing enormous yield loss (Srivastava *et al*, 2009). The insect-pest incidence is one of the major constraints in obtaining the yield potential from the newly evolved varieties and the instances of crop failure due to outbreaks of insect-pests have been reported worldwide (Reddy, 2013). Among various pests of rice, paddy leaf folder is one of the most serious pest causes 11.18 per cent of losses in paddy crop in India (Shanmungam *et al*, 2006). Rice leaf folder, the major pest of rice feed on rice leaves; hinder the photosynthesis of the leaves resulting in the reduction of rice yield. Every unit of increase in infestation by paddy leaf

folder decreases the yield by 14.0 and 1.46 per cent during summer and wet-season, respectively whereas, under epidemic situations, the yield loss varies from 30 to 80 per cent (Nanda and Bisoi, 1990). Paddy leaf folder has been reported to cause significant yield losses to the extent of 80 per cent (Satish *et al*, 2007). Out of the eight species of leaf folder, the most widespread and important one is *Cnaphalocrocis medinalis* (Guenee) (Bhatti *et al*, 1995). Among the major insect pest of rice leaf folder (LF) *Cnaphalocrocis medinalis* is considered as the most nuisance of high level of nitrogenous fertilizer and cloudy weather with low sunlight. The symptoms of leaf folder damage are characterized by the presence of a large number of leaf folds. The larvae prior to feeding, fold the leaves longitudinally and fasten the leaf margins with stitches of silk thread. The larvae feed by scraping the green mesophyll tissue from all over the inside

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of the folded leaves. Among the various strategies adopted to combat the pest of rice, insecticides are the first line of defense. However, Kumar *et al* (2020) reported that integrated pest management (IPM) module comprised of recommended dose of fertilizers+ clipping of rice seedling tips+ pheromone traps with 5 mg lure @ 20 traps/ha against yellow stem borer for mass trapping+ Spraying of NSKE 5% at 20 days interval+ need based application of chlorpyrifos 20 EC @ 1.0 l/ha and carbofuran 3G @ 20 kg/ha. The results on paddy insect-pests infestation and yield indicated that integrated pest management was superior to farmers' practice. The minimum incidence of yellow stem borer (6.57% and 5.85%) and leaf folder (5.12% and 4.72%) was found in IPM module as compared to farmers' practice. Therefore, an effort has been made in present investigation to evaluate the new molecules of chemical insecticides and assess the yield losses of rice caused by paddy leaf folder.

## MATERIAL AND METHODS

The experiment was conducted at farmers' field during *Kharif* season of 2019-20 and 2020-21 with an objective to assess the efficacy of different insecticides for the management of Leaf folder (*Cnaphalocrocis medinalis*) in paddy. During 2019-20, five farmers were selected and area under each experiment was 500m<sup>2</sup>. The detail of treatment for management of leaf folder were T1-Farmer's practice (Chloropyrifos 20 EC @ 2 ml/l), T2- Monocrotophos 36 WSC @ 1.5 ml/l of water (recommended) and T3 -Flubediamide 480 SC (Fame) @ 0.3 ml/l (New Intervention). The incidence of leaf folder was recorded on regular basis to apply different insecticidal sprays as and when larval population reached economic threshold level *i.e.* one damaged leaf/hill or 10 per cent damaged leaves. Insecticides were sprayed with the help of hand Sprayer. The care was taken to avoid drift of spray from one plot to another plot. The pre and post treatment observations on larval population of leaf folder were taken in each treatment at five places.

The percentage reduction of larval population was determined. Seed yield of paddy was recorded on the basis of individual plot and expressed in kg/ plot and converted in to kg/ ha.

The benefit: cost ratio was determined for each treatment by using the following formula:

$$\text{Benefit: Cost ratio} = \frac{\text{Monetary gain over control (Rs/ha)}}{\text{Cost of plant protection (Rs/ha)}}$$

## RESULTS AND DISCUSSION

### Efficacy of insecticides in controlling leaves damage

The data (Table 1) revealed that both insecticides lowered down and reduced percentage of the population of leaf folder in paddy as compared to control. The results during 2019-20 revealed that use of Flubediamide 480 SC (Fame) @ 0.3 ml/l of water was significantly superior resulting in 64.86 per cent reduction in damage to leaves of paddy and increased the grain yield to an extent of 43.18 per cent over farmers' practice (Chloropyrifos 20 EC @ 2 ml/l of water) followed by Monocrotophos 36 WSC @ 1.5 ml/l of water resulted ( 33.78% reduction in damage to leaves and increased the grain yield to an extent of 11.36%) over farmers' practice (Chloropyrifos 20 EC @ 2 ml/l of water). Similarly, during 2020-2021, it was observed that all insecticides lowered down and reduced the percentage of the population of leaf folder in paddy as compared to control. The results revealed that use of Flubediamide 480 SC (Fame) @ 0.3 ml/l of water was found to be superior (69.23% reduced damage to leaves and increased 44.44% grain yield) compared to farmers' practice (Chloropyrifos 20 EC @ 2 ml/l of water) followed by Monocrotophos 36 WSC @ 1.5 ml/l of water (reduced 28.20% damage to leaves and increased 6.66% grain yield) over farmers' practice (Chloropyrifos 20 EC @ 2 ml/l of water). These results were consistent with those reported by Raju *et al* ( 2016) that the insecticides, flubendiamide @ 0.1 ml/l (5.79%) and

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**Table 1. Evaluation of new insecticide for the management for leaf folder in Paddy.**

Sr. No.	Treatment	Yield (q/ha)		Damage Percent (%)		BC Ratio	
		2019-20	2020-21	2019-20	2020-21	2019-20	2020-21
1	T1 (Farmers' practice)	22.0	22.50	18.50	19.50	1.15	1.20
2	T2 (Recommended Practice)	24.50	24.0	12.25	14.0	1.40	1.35
3	T3 (New Intervention)	31.50	32.50	6.50	6.0	2.08	2.18

chlorantraniliprole @ 0.3 ml/l (5.8%) were highly effective against leaf folder in paddy.

In terms of cost benefits Flubediamide 480 SC was the best during both the years. Farmers were satisfied and ready to adopt the insecticide for control of leaf folder in Paddy. Therefore, the use of Flubediamide 480 SC @3ml. /lt. of water can be recommended for the control of leaf folder in paddy.

### CONCLUSION

The study revealed that use of Flubediamide 480 SC (Fame) @ 0.3 ml/l of water was observed to be superior which resulted in 64.86 per cent reduction in damage to leaves of Paddy and increased the grain yield to an extent of 43.18 per cent over farmers' practice (Chloropyriphos 20 EC @ 2 ml/l of water) followed by Monocrotophos 36 WSC @ 1.5 ml/l of water. Therefore, the use of Flubediamide 480 SC @ 0.3 ml./lt. of water can be recommended for control of leaf folder in paddy.

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