

## Efficacy of Leptophos Against Gall-Midge and Blast Disease of Rice

By

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### ABSTRACT

Leptophos, an organophosphorus insecticide, @ 1 l/ha per spray was not only effective in bringing down the final foliar and neck blast, but also arrested the rate of spread of foliar infection. Incidence of silver shoots was also brought down. There was also a significant increase in yield.

### INTRODUCTION

Rice gall-midge (*Pachydiplosis oryzae* Wood-Mason) blast and disease caused by *Pyricularia oryzae* Cav. are the two major limiting factors in rice production. In earlier studies at this Institute, attempts have been made to control both, blast and rice gall-midge through the application of different fungicides and insecticides. Chemicals having both fungicidal and insecticidal properties are rare. Leptophos [O-(4-bromo-2, 5-dichlorophenyl) O-methyl phenyl phosphonothioate) EC 34%] an organophosphorus insecticide was reported to possess both these qualities (Tech. Bull, Phosvel-Mysore Insecticides, India). The efficacy of leptophos along with other fungicides viz., benomyl, Methyl-1 (butyl carbomoyl-2-benzimidazole carbamate) 50% W.P., EDDP (O-ethyl-S-S-diphenyl-dithio phosphate) 50% E.C. and KSM [1-O-Inositol-2-amino-4-

aminodiketo ethyl amine (2,3,4,6 tetradeoxy) mannoside hydrochloric acid salt 2% W.P.] against rice blast and gall-midge was studied.

### MATERIALS AND METHODS

For blast control trials, 25 day old healthy seedlings of a highly blast susceptible cultivar Co.13 was transplanted in the field with a spacing of 15x15 cm. The variety Pusa 2-21 was used for studies on gall-midge. All the experiments were laid out in a randomised block design. Three sprayings at the rapid tillering stage to check foliar blast at an interval of ten days and two sprayings after flower emergence at an interval of five days to check neck blast, were given. For gall-midge control, in all, five sprays at an interval of ten days were given. Observations on the foliar, neck blast (Padmanabhan and Ganguly, 1959) and gall-midge were recorded in 1 sq.m. samples in each plot.

## RESULTS AND DISCUSSION

During *Rabi* 73 there was a significant reduction in foliar and neck infection in all the treatments from control with a corresponding significant increase in yield (Table I). However, leptophos was found to be superior

to the other three chemicals, *viz.*, benomyl, EDDP and KSM with respect to efficiency and increase in yield. These results were confirmed during *Kharif* 73 except that with EDDP, significant increase in yield was not observed. Leptophos was again found superior to EDDP and KSM in bringing

TABLE I Effect of chemicals on foliar and neck blast yields in *Rabi* and *Kharif* 1973 (Var. Co.13)

Chemicals	Dosage per ha	Fungicidal Efficacy				Percentage of yield increase	
		Foliar Blast		Neck blast		Rabi '73	Kharif '73
		Rabi '73	Kharif '73	Rabi '73	Kharif '73		
Leptophos	1 l	90.5*	65.8*	98.8*	66.1*	64.2*	71.2*
Benomyl	2kg	61.7*	66.8*	66.8*	77.9*	45.4*	50.0*
EDDP	1 l	55.0*	35.1*	61.7*	34.9*	9.2*	37.0
KSM	1kg	40.4*	45.1*	72.7*	57.3*	49.1*	58.5*
Values in control		21.86@	44.34@	50.60**	22.41**	0.59@@	0.17@

\* Significant at 5% level. \*\* Mean neck infection %.

@ Mean score of foliar infection, @@ Mean yield in kg per plot

down the infection and increasing yields. However, its performance in controlling infection was on par with benomyl.

Further analysis on the yield contributing factors with respect to the disease revealed a significant decrease in the percentage of leaves infected and the extent of damage to leaves, in all the treatments from control. However, leptophos was found far superior to the other three. There was significant increase in the number of ear bearing tillers (EBT) only with leptophos. These results indicate that the

significant increase in yield associated with leptophos over other treatments is obviously due the overall reduction in blast infection which contributed to the increase in the number of EBT.

The effect of leptophos on the incidence of gall-midge in the variety *Pusa 2-21* is presented in Table II. Leptophos was associated with a significant decrease in the percentage of silver shoots with a corresponding increase in yield over the check plot, while the other three chemicals being fungicides did not respond to gall-midge incidence. In earlier studies

TABLE II Effect of chemicals on Gall-midge on rice Kharif 1973-Var. Pusa 2-21.

Chemicals	Dosage per ha	Reduction in silver shoots (%)	% of yield increase
Leptophos	1 l	61.1*	59.2*
Benomyl	2 kg	7.0	0
EDDP	1 l	5.9	0
KSM	1 kg	16.7	13.4
Values in control		53.7**	0.58*

\* Significant at 5% level, \*\* Mean % of silvershoots (a) Mean yield in kg per plot

with different chemicals, to control blast, only leptophos was found to possess the ability to arrest the rate of infection per unit per day with a significant increase in yield (Nayak *et al.*, 1976). The five sprays, 3 for foliar blast and 2 for neck blast, would overlap at least 2-3 generations of rice stem borer and gall-midge. As an insecticide leptophos also was reported to be effective in controlling rice stem borer (Annual Report, CRRI, 1971-72)

and whorl maggot (Rao, Dani and Prakasa Rao, 1976). The results projected here brings out clearly the unique insecticidal and fungicidal properties of leptophos. Therefore, exploitation of leptophos in controlling the diseases and pests of rice would minimise the cost of plant protection measures.

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