

## **Field evaluation of certain insecticides against Brinjal shoot and fruit Borer, *Leucinodes orbonalis* Guen**

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### **ABSTRACT**

A field experiment was carried out for evaluating newer insecticides in comparison with conventional insecticides against brinjal shoot and fruit borer, *L. orbonalis* during kharif 2005-2006 at Research Farm, B.R.D.P.G.College, Deoria. The result revealed that amongst newer insecticides cartap hydrochloride 50 SP @0.1% gave most promising result in reducing shoot infestation (5.6%), fruit infestation (22.21% on number basis and 25.30% on weight basis) and increasing yield of brinjal (75.00 q/ha.). Among the conventional insecticides Fenvalerate 30 EC @ 0.006% and Monocrotophos 36 EC @ 0.05% was found to be superior in terms of efficacy and yield. Although, ICBR showed that application of Endosulfan 35 EC showed most viable treatment (1: 23.89) followed by Fenvalerate 30 EC (1: 23.17).

**Key words:** Brinjal shoot and fruit Borer, chemical control, field evaluation, ICBR.

### **Introduction**

Brinjal shoot and Fruit borer, *Leucinodes orbonalis* is most destructive and is considered to be the major limiting factor in quantitative as well as qualitative harvest of brinjal fruits. The larvae bore in to the young axillary shoots, causing wilting and enters into fruits when available with small entrance holes plugged with excreta. The infested fruits become unfit for human consumption. The pest accounts for 44.11 per cent of shoot infestation and 62.50 and 55.40 per cent fruit infestation on number and weight basis, respectively (Tripathi *et al*, 1996). However, 48.30 per cent losses in yield of brinjal fruit are reported by this pest Singh *et al*, (2000).

Several insecticides of various groups have been recommended for the management of this pest in various part of the country. But their indiscriminate use created several problems in natural ecosystem, resulting in environmental pollution, pest resistance, resurgence and health hazards. Now a days it is seen that brinjal growers are not getting satisfactory control of the pest in spite of repeated application of recommended insecticides. Hence such insecticide needs to be substituted by superior insecticides especially newer ecofriendly

products. Therefore, the present investigation was undertaken to evaluate the performance of different insecticides against brinjal shoot and fruit borer in eastern Uttar Pradesh Conditions.

### **Materials and Methods**

Field experiment was carried out during Kharif season of 2005-06 at the research farm of B.R.D.P.G. College, Deoria, U.P.. The experiment was laid out in randomized block design with seven treatments including untreated check. The treatments comprised of four conventional and to newer insecticides. One month old seedlings of var. pusa purple round were transplanted in a plot of 4x3 M with inter and intra row spacing of 60x60 cm, respectively. All the recommended agronomic practices were followed to raise a good crop. The first spray of respective treatment was given as soon as pest population exceeded five per cent infestation and repeated at 15 days interval. A total of three sprays were given.

Observations were recorded on healthy and infested shoots after each sprays on five randomly selected plants in each plots. The performance of each insecticide against fruit

borer was assessed by recording the number and weight of infested and healthy fruits at each picking. The yield of brinjal fruits was recorded separately from each plot and converted in to hectare basis. Considering the present cost of various inputs of all the treatments and the yield of brinjal the cost benefit ratio was worked out in order to get effective and economically viable treatment for the management of *L. orbonalis*.

### Results and Discussion

The pooled data of three spraying (table-1) revealed that all the insecticide treated plots were recorded significantly less shoot damage, fruit infestation and higher yield of brinjal as compared to untreated check. Among the insecticides, Cartap hydrochloride 50 SP @0.1% was found to be most superior treatment with lowest shoot infestation (5.6%). The next equally effective treatments were Spinosad 45 EC (8.66%) and Fenvalerate 30 EC (9.39%). The

other effective treatments in their descending order of minimizing the shoot infestation were Carbaryl (14.37%), Endosulfan (17.50%) and Monocrotophos (22.50%).

As far as fruit infestation on number basis is concerned Cartap hydrochloride 50 SP @0.1% was found significantly most effective treatment (22.21%) which was followed by Spinosad 45 EC @ 0.01% (30.67%). Next in order of efficacy was Fenvalerate (31.94%), Endosulfan (32.79%) and Carbaryl (34.89%) remain at par to each other. The results on fruit infestation on weight basis revealed that lower infestation of brinjal fruit borer was exhibited in cartap hydrochloride (25.30%), followed by Spinosad (29.28%). Next in order of merit were Fenvalerate (32.35%), Endosulfan (32.37%), Monocrotophos (34.21%) and Carbaryl (36.80%). Maximum shoot and fruit infestation were noticed in untreated control.

**Table 1 Efficacy of insecticides against the brinjal shoot and fruit borer**

Treatments	Conc. (%)	Shoot infestation (%)	Fruit infestation (%)		Yield of healthy fruits (Kg/plot)	Yield (Q/ha.)
			Number basis	Weight basis		
Spinosad 45 SC	0.01	8.66 (16.79)*	30.67 (31.35)	29.28 (33.35)	8.38	59.05
Carbaryl 50 WP	0.05	14.37 (22.01)	34.89 (36.56)	36.80 (37.34)	7.29	50.30
Endosulfan 35 EC	0.05	17.50 (24.69)	32.79 (33.59)	32.37 (35.15)	9.33	66.25
Cartap hydrochloride 50 SP	0.1	5.60 (13.45)	22.21 (29.06)	25.30 (30.14)	10.92	75.00
Fenvalerate 30 EC	0.006	9.39 (17.85)	31.94 (33.13)	32.35 (34.18)	7.37	48.70
Monocrotophos 36 EC	0.05	22.50 (28.29)	36.39 (37.10)	34.21 (35.70)	7.20	50.20
Untreated Check	-	35.00 (36.26)	46.01 (42.64)	43.25 (40.05)	2.5	23.50
SE (M)+_	-	1.19	1.10	1.17	-	0.82
CD at 5%	-	3.53	3.27	3.37	-	2.49

\*Figures in parenthesis are angular transformed values

**Table 2 Incremental cost benefit ratio for different treatments**

Treatment	No. of Spray	Total cost of treatment (Rs./ha.)	Yield (q/ha.)	Increase in yield over control (q/ha.)	Gross income (Rs./ha.)	Additional income (Rs./ha.)	C:B ratio (Rs./rupee invested)	Rank
Spinosad 45 SC	3	612	59.05	35.55	23620	13608	22.23	3
Carbaryl 50 WP	3	705	50.30	26.80	20120	10015	14.20	4
Endosulfan 35 EC	3	687	66.25	42.75	26500	16413	23.89	1
Cartap hydrochloride 50 SP	3	2265	75.00	51.50	30000	18335	8.09	6
Fenvalerate 30 EC	3	417	48.70	25.20	19480	9663	23.17	2
Monocrotophos 36 EC	3	778	50.20	26.70	20080	9902	12.72	5
Untreated Check	-	-	23.50	-	9400	-	-	

### Cost of insecticides and materials

1. Spinosad =Rs. 1000/lit
2. Carbaryl = Rs. 300/Kg
3. Endosulfan = Rs. 200/lit
4. Cartap hydrochloride = Rs. 800/Kg
5. Fenvalerate = Rs. 300/lit
6. Monocrotophas = Rs. 260/lit
7. Labour cost = Rs. 50/day
8. Sprayer rent = 15/day
9. Sale Price of brinjal = 400/q

The significantly highest yield of brinjal fruit was registered in Cartap hydrochloride 50 SP @0.1% (7500 q/ha.). It was followed by Spinosad (59.05 q/ha.), Endosulfan (66.25 q/ha.) and Carbaryl (50.30 q/ha.). The yield obtained under plot treated with Monocrotophos (50.20 q/ha.) and Fenvalerate (48.70 q/ha.) showed statistically nonsignificant. Control plot recorded significantly lowest yield (23.50 q/ha.) than treated plots.

Cost benefit analysis presented in table-2 indicated that increase in yield over control

varied from 25.20 to 51.50 q/ha in different treatments. Maximum additional income (Rs.18335/ha.) was obtained in Cartap hydrochloride 50 SP. But the cost benefit ratio was highest with Endosulfan 35 EC (1 : 23.89) followed by Fenvalerate 30 EC (1 : 23.17), Spinosad 45 EC (1 : 22.23), Carbaryl 50 WP (1 : 14.20) and Monocrotophos 36 EC (1 : 12.72). The lowest cost benefit ratio (1 : 8.09) was obtained in Cartap hydrochloride 50 SP.

From the overall result it could be concluded that newer insecticide Cartap hydrochloride and Spinosad found to be best in reducing shoot and fruit infestation of *L. orbonalis* and increasing brinjal fruit yield. These findings are in close confirmity with the findings of Rai & Satpathy (1996) and Nitam & Mali (2002). However, CB ratio was lower with these two most effective insecticides might be due to higher cost of insecticide. Endosulfan and Carbaryl were best among the conventional insecticides in all the respects were also reported by Roy & Pande (1994).

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