

## CONTROL OF BRINJAL FRUIT BORER, *LEUCINODES ORBONALIS* GN. WITH SOME INSECTICIDES

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The incidence of attack by *Leucinodes orbonalis* Gn. was studied under natural conditions in three different localities of Muzaffarabad district. It was found that the percent infestation varied slightly on different localities at the same time of the season. At all the localities, insect damage started in Aug. (19.6%) which increase with passage of time and reached to its maximum in Sept. (71.9%). Three insecticides viz., Decamethrin, Metasystox and DDVP were used to control this pest. Sprays were started when first insect larvae appeared boring in fruits. Decamethrin was more effective than the Metasystox and DDVP. These insecticides were applied at two different intervals viz. 10 and 15 days. There was no significant difference between the two spray schedules. Similarly, there was also no significant difference between the size of fruit and the yield obtained from the different insecticidal treatments.

**Key words:** Brinjal, Fruit borer, Insecticides.

### Introduction

The brinjal fruit borer, *Leucinodes orbonalis* Gn., is one of the most serious insect pests of brinjal and attacks all parts except roots. The extent of fruit loss may go as high as 62%. The result is that production is lowered and the quality of fruit is greatly diminished. Systematic efforts are needed to find an effective and economic control of this insect. Although the pest can be partially controlled by various cultural methods, chemical control is the most important and effective one.

It was successfully controlled by the use of some organophosphates and synthetic pyrethroids at an interval of 7-15 days [1-6,8,10,11]. The application of Diazinon or Phorate granules at pre-flowering stage followed by two or three foliar sprays of Carbaryl in the late fruiting period gave effective control of *L. orbonalis* Gn. and resulted in considerable increase of yield [7,9]. The studies on incidence and control of this important insect pest were not conducted in Azad Jammu and Kashmir since before. The present research was, therefore, undertaken to work out the incidence of brinjal fruit borer and its chemical control.

### Materials and Methods

**Incidence of brinjal borer.** Three localities in Muzaffarabad district one each at Jalal-a-Bagh in the town of Muzaffarabad, Kathai in Tehsil Hattian and Chhattarkalas in Tehsil Muzaffarabad served as areas for working out the incidence of insect attack. At each locality one experimental plot (6x3m) was selected in the Government Vegetable Seed Production Farms. Observations were made fortnightly starting from the beginning of Aug. until the end of Oct. The plots were not

sprayed during the experimental period. At each locality 20 plants in the experimental plot were randomly selected and permanently marked. At each observation all fruits (more than 2.5 cm in length), both infested and uninfested on the marked plants were counted and recorded. A fruit which contained a hole, resulting from larval boring, was considered as infested.

**Effectiveness of insecticides.** The experiment was laid out in the field at Shoran Village near Muzaffarabad for the chemical control of brinjal fruit borer. Three insecticides, namely, Decamethrin, Metasystox and DDVP were used at the rate of 10 g a.i. per hectare, 625g a.i. per hectare and 938g a.i. per hectare, respectively. The spray programme was started in the beginning of Aug. when first larvae were seen infesting fruits. The spray interval was split into two schedules and in each schedule there were a total of six sprays. In the first schedule the sprays were repeated after every 10 days whereas in the second after every 15 days.

The experiment was laid out in split plot design and there were 3 replications. Thus in total there were (3 insecticides + 1 control) x (3 replications) x (2 schedules) = 24 sub-plots. Each sub-plot measured 3 x 1.5m in size. Each time all the plants in each sub-plot were thoroughly sprayed and the control plots were sprayed with water only.

Data on the effectiveness of spray were recorded by counting the number of infested fruits containing larval holes after each spray. As the fruits matured, they were picked and the infested ones dissected to record larval mortality. This was done to see how far these insecticides were able to kill the larvae once they had entered the fruit. The yield data of the crop was recorded and average weight of fruit was also calculated. Data thus obtained was subjected to statistical analysis.

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### Results and Discussion

Data on incidence of brinjal fruit borer at three different localities in Muzaffarabad district is given in Table 1. It shows that infestation was minimum at all the three localities in Aug., which increased to maximum in Oct. Average number of infested fruits at different localities were 19.6% in Aug., 55.1% in Sept. and 71.9% in Oct. A comparison of three different localities shows that maximum infestation (52.3%) was found at Chhatarkalas. At Jalal-a-Bagh a mean of 44.2% fruits was found infested. Incidence of attack at Kathai was intermediate (50.1%) between the other two localities. Level of attack by brinjal fruit borer on fruits at all the three localities was more or less similar.

Effectiveness of insecticides in reducing the pest infestation is given in Table 2. It shows that Decamethrin was the most effective insecticide followed by Metasystox and DDVP at both the spray intervals. It was significantly better than Metasystox and DDVP which did not differ significantly from each other. However, all the three insecticides were significantly better than the control treatment. The application of all the insecticides at an interval of 10 days was better to reduce the pest infestation when compared the application of the same

TABLE 1. INCIDENCE OF ATTACK (%AGE OF ATTACKED FRUITS) BY BRINJAL FRUIT BORER DURING VARIOUS MONTHS AT THREE DIFFERENT LOCALITIES.

Months	Localities			Average of three months
	Jalal-a-Bagh	Kathai	Chhatarkalas	
August	13.5	20.9	24.4	19.6
September	50.0	56.8	58.4	55.1
October	69.1	72.7	74.0	71.9
Ave. of 3 months	44.2	50.1	53.3	-

TABLE 2. ANALYSIS OF VARIANCE FOR EFFECTIVENESS OF INSECTICIDES APPLIED AT TWO INTERVALS (%AGE INFESTATION).

S.V.	D.F.	S.S.	M.S.	F. Ratio	Tab. values	
					5%	1%
Repts.	2	37.31	18.655	-	-	-
Interval	1	115.06	115.06	12.75 <sup>NS</sup>	18.51	98.49
Error I	2	18.05	9.025	-	-	-
Treats	3	2630.45	876.82	73.93 <sup>**</sup>	3.49	5.59
I x T	3	5.21	1.74	-	-	-
Error II	12	142.31	11.86	-	-	-

COMPARISON OF MEANS

Interval/ treatments	Decamethrin	Metasystox	DDVP	Control
10 days	15.47	24.71	18.16	45.50
15 days	21.09	29.55	32.06	48.74

insecticide at an interval of 15 days but the effectiveness of these two different spray schedules was insignificant.

It is seen from Table 3 that larval mortality caused by all the insecticides at both the spray intervals differed significantly from each other and also from the control treatment. It further shows that Decamethrin was the most effective insecticide followed by Metasystox and DDVP in killing the larvae feeding inside the fruit. A comparison of two spray schedules indicate that significantly more larval mortality was caused by all the insecticides when repeated at an interval of 10 days rather than at an interval of 15 days.

Fruit yield from the control and various insecticide treated plots is given in Table 4. Analysis of variance showed that no significant difference existed among the fruit yield of plots treated with various insecticides and control treatment. It can be seen that maximum fruit yield was obtained with Decamethrin followed by Metasystox, DDVP and control treatment.

TABLE 3. ANALYSIS OF VARIANCE OF LARVAL PERCENT MORTALITY.

S.V.	D.F.	S.S.	M.S.	F. Ratio	Tab. values	
					5%	1%
Repts.	2	16.79	7.39	-	-	-
Interval	1	165.22	165.22	78.68 <sup>*</sup>	18.51	98.49
Error I	2	4.21	2.10	-	-	-
Treats	3	4365.42	1455.14	112.02 <sup>**</sup>	3.49	5.59
I x T	3	138.15	46.05	-	-	-
Error II	12	155.96	12.99	-	-	-

#### COMPARISON OF MEANS

Interval/ treatments	Decamethrin	Metasystox	DDVP	Control
10 days	43	34	18	5
15 days	39	21	16	3

NS = Non significant; \* = Significant; \*\* = Highly significant.

TABLE 4. DATA SHOWING THE FRUIT YIELD OBTAINED FROM FOUR DIFFERENT TREATMENTS APPLIED AT 10 DAYS AND 15 DAYS INTERVAL.

Appl. Interval	Yield in kg from plots of			
	Control	Decamethrin	Metasystox	DDVP
10 days	18	30	25	20
15 days	17	28	24.5	21

TABLE 5. DATA SHOWING NUMBER OF FRUITS/KG IN DIFFERENT TREATMENTS.

Appl. Interval	Control	Decamethrin	Metasystox	DDVP
10 days	11.24	10.16	10.17	10.48
15 days	8.85	7.82	8.17	8.63

Similarly no significant difference was found among the two spray schedules when the various insecticides were applied at different intervals.

The size of the fruits and number of fruits per kg also varied (Table 5). It shows that larger size fruits were obtained in Metasystox followed by Decamethrin, DDVP and then control.

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