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EVALUATION OF SOME IGR'S AGAINST BRINJAL SHOOT AND FRUIT BORER

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ABSTRACT

Emamectin benzoate, novaluron, diflubenzuron, *Bacillus thuringiensis* and untreated control were evaluated for bioefficacy against brinjal fruit and shoot borer and their impact on coccinellides on brinjal crop. Minimum shoot damage 4.89 per cent after first three sprays was observed in Emamectin benzoate followed that in Novaluron (5.29%). Similarly fruit damage was also minimum, 12.45, 14.47 and 10.25 fruits in Emamectin benzoate after 3rd, 4th and 5th spray compared to other test insecticides. Emamectin benzoate was found at par with Novaluran and Diflubenzuron but superior to *Bt*k and control.

Keywords: *Leucinodes orbonalis,* brinjal, cocinellides, emamectin benzoate, novaluron, diflubenzuron, *Bacillus thuringiensis*

INTRODUCTION

Brinjal is an important vegetable crop and grown all over the India. It is infested by many insect pests that cause huge loss in yield. Therefore reports of 26 insects pests from India, while shoot and fruit borer, *Leucinodes orbonalis* Guenee (Pyralidae: Lepidoptera) is considered the most important one. It has been reported from across the country (Patel and Basu, 1948) and found most destructive and active through out the year particularly under high temperature and humid conditions. The larvae of *L. orbonalis* bore into the young axillary's shoots, causing wilting and enter into fruits unobtrusively, with small entrance holes plugged with excreta. This pest accounts for 40.11 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).

The sole reliance on insecticide for the control of the pest has resulted in residual and environmental problems. Therefore, the present study was taken to evaluate the performance of novel insecticides against brinjal shoot and fruit borer (BSFB).

MATERIALS AND METHOD

The present investigations were carried out at the Instructional Farm, Post Graduate Institute, MPKV, Rahuri, Dist. Ahmednagar (M.S.) during *kharif* 2008 in randomized block design. Five treatments *viz.*, diflubenzuron 50 g a.i., novaluron 25 ml a.i., *Bacillus thuringiensis* 500 g a.i. per hectare, emamectin benzoate 10 g a.i. and untreated control were evaluated with four replications. Five sprays of insecticides were undertaken at 45, 60, 75, 90 and 105 days after transplanting during morning hours using knapsack sprayer. Pre treatment observations were recorded 24 hours before application of treatment and post treatment observations were recorded 3, 7 and 10 days after spraying. The fruit damage was recorded at each picking. The shoot and fruit infestations were recorded by counting total number of healthy and infested shoots and fruits on randomly selected, tagged five plants in each treatment.

RESULTS AND DISCUSSION

It is apparent from the Table 1 that the treatment of crop with emamectin benzoate (Table 1) was found most effective against BSFB wherein 4.89 per cent infested shoots were only recorded followed with 5.29, 6.44 and 7.13 per cent in Novaluron, Diflubenzuron and *BtK* WG compared to 10.86 per cent in untreated control.

The data recorded on fruit damage by BSFB (Table 2) showed that minimum number of infested fruits 12.45, 14.47 and 10.25 were observed in Emamectin benzoate after 3rd, 4th and 5th spray followed by 13.90, 15.75 and 12.02 in Novaluron, 15.51, 17.04 and 12.06 in Diflubenzuron and 16.94, 19.53 and 15.87 in *Btk* respectively. All treatments were found significantly superior to control but emamectin benzoate were at par with Novaluron and Diflubenzuron.

The yield of healthy fruits in emamectin benzoate treated crops was maximum, 20.46 t ha^{-1}, followed by 19.21 and 18.26 t ha^{-1} in Novaluron and Diflubenzuron. The lowest fruit yield was recorded in untreated control, which recorded 12.21 t ha^{-1}. Minimum yield in treatments was recorded in *BtK* plots (17.45).

Table 1. Efficacy of pesticide treatments against brinjal shoot and fruit borer based on shoot damage

Treatments	Mean per cent infested shoots			
	Ist spray	IInd spray	IIIrd spray	Overall Mean
Diflubenzuron 25 WP @ 50 g a.i. ha^{-1}	9.99 (18.358)	7.50 (15.83)	1.83 (7.54)	6.44 (13.90)
Novaluron 10 EC @ 25 ml a.i. ha^{-1}	8.59 (16.96)	5.79 (13.89)	1.51 (7.03)	5.29 (12.62)
*Bt*k 11 WG @ 500 g ha^{-1}	10.39 (18.83)	8.62 (17.03)	2.39 (11.49)	7.13 (15.78)
Emamectin benzoate 5 SG @ 10 g a.i. ha^{-1}	8.08 (16.43)	5.51 (13.60)	1.08 (6.25)	4.89 (12.09)
Untreated control	12.54 (20.90)	14.32 (22.19)	5.74 (13.02)	10.86 (18.70)
S.E. ±	0.62	0.53	0.87	0.67
CD at 5%	1.92	1.66	2.70	2.09

Figures parenthesis are arc sine transformed value.
Figures in parenthesis are square root transformed values of coccinellides population.

Table 2. Efficacy of pesticide treatments against brinjal shoot and fruit borer based on fruit damage

Treatments	Mean per cent infested fruits						Yield (t ha^{-1})
	3rd spray		4th spray		5th spray		
	Number basis	Weight basis	Number basis	Weight basis	Number basis	Weight basis	
Diflubenzuron 25 WP @ 50 g a.h. ha^{-1}	15.51 (23.13)	15.32 (22.95)	17.04 (24.25)	16.55 (23.94)	12.06 (20.67)	12.34 (20.44)	18.26
Novaluron 10 EC @ 25 ml a.i. ha^{-1}	13.90 (21.73)	12.58 (21.52)	15.75 (23.27)	15.52 (23.14)	12.02 (20.15)	11.38 (19.68)	19.71
*Bt*k 11 WG @ 500g ha^{-1}	16.94 (24.28)	16.98 (24.31)	19.53 (26.16)	18.60 (25.52)	15.87 (23.42)	15.83 (23.40)	17.45
Emamectin benzoate 5 SG @ 10 g a.i. ha^{-1}	12.45 (20.50)	12.52 (20.55)	14.47 (22.18)	14.42 (22.24)	10.25 (18.55)	10.39 (18.71)	20.46
Untreated control	28.95 (31.56)	25.92 (30.56)	27.44 (31.50)	26.92 (31.26)	24.93 (29.87)	24.93 (29.90)	12.21
S.E. ±	1.11	0.85	0.70	0.48	1.06	0.90	
CD at 5%	3.45	2.63	2.17	1.49	3.30	2.77	

Figures in parenthesis are arc sine transformed value.

The results corroborate with the findings of many workers (Udikeri *et al.*, 2004) who reported emamectin benzoate most effective against BSFB. Earlier reports indicate Novaluron effective against BSFB, while in another study Strivastava *et al*. (2007) reported Diflubenzuron quite effective against BSFB as compared to *Bt*k. Patel and Vyas (2000) reported *Bt*k less effective against BSFB.

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