

Evaluation of some newer insecticides against maruca on greengram

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Spotted pod borer, *Maruca vitrata* (Geyer) is a serious pest of legumes grains in tropics and subtropics, because of its extensive host range, destructiveness and distribution on pigeonpea, cowpea, mungbean, urdbean and field bean in southern zone of A.P. *Maruca* larvae feed on buds, flowers and pods by webbing them. This type of typical concealed feeding protects the larvae from natural enemies, human interventions and other adverse factors like insecticides (Sharma, 1998). In the present investigations, some newer insecticides were evaluated for their efficacy against *M. vitrata* in greengram. Lambda cyhalothrin in combination with Dichlorvos was found effective with 4.97% pod damage followed by Novaluron and Spinosad.

Key words : *Maruca vitrata*, Greengram, Lambdacyhalothrin + DDVP, Novaluron, Spinosad

INTRODUCTION

Legume pod borer *M. vitrata* is one of the major constraints in increasing the production and productivity of greengram causing economic loss of 25-50%. Though the farmers are using conventional insecticides, control of maruca is lacking. During *rabi*, pulses seed production is extensive because of good seed size and excellent seed quality, which enable the farmers to get good yield with good remuneration. It is therefore, felt necessary to evaluate some newer insecticides against maruca, which give an economically viable and sustainable protection system.

MATERIALS AND METHODS

An insecticidal evaluation trial was conducted during *rabi*, 2004 and 2005 at A.R.S., Madhira, Khammam district, A.P. The experiment was laid out in a Randomized Block Design with ten treatments replicated thrice with 18 sq mt individual plot size. Greengram variety MGG-295 was maintained under unprotected conditions while adopting all the recommended agronomic practices till the imposition of treatments (Table 1).

Observations on larval population of inflorescence and pods were recorded one day before spraying and larval mortality on 3, 5 and 7 days after spraying on ten randomly selected plants in each treatment. Data on efficacy (Abbott, 1925) based on larval counts on respective days of observation. Pod damage and yield were computed and subjected to statistical analysis.

RESULTS AND DISCUSSION

The results of the experiment are presented in the Table.

The larval population before chemical application was uniformly distributed in the experimental field. It is evident that all the treatments were effective against maruca when compared to the untreated control. The treatment of Lambda cyhalothrin in combination with DDVP showed immediate knockdown effect and the efficacy was continued upto 5DAS due to which pod damage was significantly less (5.29%). In case of Novaluron, Thiodecarb and Spinosad, they worked slowly with persistent efficacy upto 7DAS with lesser pod damage. It was demonstrated that the most effective treatments suppressed the population of maruca and contributed for good yields when compared to control (389 Kg/ha).

Since present studies were conducted during *rabi*, improved efficacies and prolonged persistence of Spinosad and Novaluron in the cooler periods resulted in good yield (872 and 871 Kg/ha) followed by Chlorpyrifos +DDVP (852 Kg/ha) and Lambda Cyhalothrin DDVP (822 Kg/ha). Vadodaria *et al.* (2001) reported the superiority of spinosad in cotton with lower larval population, minimum bollworm damage and higher seed cotton yield. These results are also in accordance with the findings of Das Mahapatra and Srivasthava, 2002 who reported that Lambda Cyhalothrin 5EC @ 25 g a.i/ha, Thiodecarb @750g a.i/ha attributed to higher yield and lesser larval incidence. Vishal mittal and Ram Ujagir (2005) reported the efficacy of spinosad in redgram against maruca. These findings were in agreement with Chandrayudu *et al.* (2006) who reported that Novaluron and Thiodecarb were promising treatments and showed moderate suppression of the maruca on cowpea.

Chlorpyrifos alone treatment was found less effective as high pod damage (14.42%) was recorded

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Table 1 : Evaluation of newer insecticides against Maruca on Greengram during rabi season

Treatments	Before Spraying Number / plant		Maruca Larval Mortality			Pod Damage (%)	Yield (Kg/ha)
	Webs	Larvae	3 DAS	5 DAS	7 DAS		
Chlorpyriphos (2.5ml)	1.50	1.43	0.35	0.33	0.33	14.42	730
NSKE 5% + Chlorpyriphos 1.25 ml	1.33	1.42	0.30	0.33	0.31	9.23	731
NSKE 5% + DDVP (0.5 ml/lt)	1.63	1.42	0.35	0.36	0.35	10.58	788
Chlorpyriphos 1.25ml + DDVP (0.5 ml/lt)	1.50	1.31	0.32	0.37	0.27	11.60	852
Lambda cyhalothrin 2 ml + DDVP 0.5 ml/lt	1.39	1.90	0.43	0.51	0.29	5.29	822
Novaluron (1.0 ml/lt)	1.42	2.19	0.35	0.48	0.73	7.64	871
Triazophos (2.0ml/lt)	1.45	1.55	0.25	0.38	0.29	7.25	778
Spinosad (0.4 ml/lt)	1.56	1.24	0.21	0.43	0.39	7.85	872
Thiodcarb (1.0 g/lt)	1.51	1.22	0.27	0.36	0.54	8.15	804
Control	1.68	3.21	0.00	0.12	0.16	42.97	389
S.E.±	0.051	0.131	0.010	0.019	0.019	0.421	25.644
C.D. (P=0.05)	0.152	0.388	0.029	0.058	0.056	1.252	76.186
C.V (%)	5.90%	13.40%	6.00%	9.10%	8.90%	5.80%	5.80%
F-test	Sign	Sign	Sign	Sign	Sign	Sign	Sign

DAS = Days after spraying

Table 2: Bacterial activity for normal solvents & Antibiotics used as a control : Zone of inhibition in (mm)

Test organism	Diameter of Zone of inhibition in (mm)				Concentration of antibiotic added in mg/ml					
	Normal solvents				Methanol	10	8	6	4	2
	Chloroform	Petroleum ether	Ethyl acetate							
<i>Escherichia coli</i>	01	01	01	01	13	14	11	10	09	
<i>Bacillus subtilis</i>	01	01	03	01	13	11	12	09	08	
<i>P. aeruginosa</i>	01	-	03	01	12	11	10	10	07	

with lower yield (730 Kg/ha). Even though the combinations of NSKE 5% + DDVP (10.58) and Chlorpyriphos +DDVP (11.60) recorded more percentage of pod damage but good yields 788 Kg/ha and 852 Kg/ha, respectively which were significantly *at par* with Spinosad, Novaluron and Lambda Cyhalothrin.

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