

RESEARCH ARTICLE

Evaluation of different insecticides and bio-pesticides for control of pigeonpea pod borer (*Helicoverpa armigera* Hubner)

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ABSTRACT

The results of the investigation on chemical control of gram pod borer, *Helicoverpa armigera* Hubner infesting pigeonpea indicated that among the different insecticides tested, indoxacarb 0.0075 per cent gave the highest per cent mortality of the pest followed by spinosad 0.009 per cent, profenophos+ cypermethrin 0.044 per cent and endosulfan 0.07 per cent. Endosulphon 0.07 per cent 0.0075 per cent recorded significantly highest grain yield (1486 kg/ha). While, highest cost benefit ratio of 1: 18.94 was also obtained from the treatment of endosulfan 0.07 per cent.

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INTRODUCTION

Pigeonpea is an important pulse cum grain legume crop and due to the productivity, favourable conditions and economics of the crop; the area under crop is increasing year by year. Among the insect species infesting pigeonpea, the pod borer complex is reported to reduce the yield upto 27.77 per cent (Sahoo and Senapati, 2000) and among the borers, gram pod borer (*Helicoverpa armigera* Hubner) is considered as most destructive. Thus, attempts were made in the present investigation to study the efficacy of certain insecticides and biopesticides against *H. armigera*.

MATERIALS AND METHODS

The pigeonpea TTB-7 was sown at Zonal Agricultural Research station University of Agricultural Sciences, Bangalore during *Kharif*-2009 in a plot size of 15 ft x 5ft with the spacing of 90 cm x 30 cm. Twelve treatments were evaluated with 5 replications in randomized block design. First spray of insecticidal treatments was given at 50 per cent flowering and subsequent spray (second) was applied at 50 per cent pod formation stage of the crop. Observations on pod borer larvae

were recorded from five randomly selected plants from each treatment at one day before and 3, 7 and 10 days after spraying. The data were converted into per cent mortality by using the formula given by Abbott (1925) and modified by Henderson and Tilton (1955).

RESULTS AND DISCUSSION

A perusal of data in Table 1 indicated that the treatment of indoxacarb 0.0075 per cent caused highest mortality (89 to 96%) of the pest followed by spinosad 0.009 per cent (86 to 95% mortality) and the ready mixed insecticide profenophos + cypermethrin 0.044 per cent (85 to 94% mortality). The next effective treatments were endosulfan 0.07 per cent, quinalphos 0.05 per cent, monocrotophos 0.05 per cent and novaluron 0.01 per cent with 88 to 79 per cent mortality of the pest. The results are in confirmation with the findings of Mittal and Ujagir (2005). The rest of the insecticides gave the yield of 1417 to 875 kg/ha. Similar observations were also reported by Giraddi *et al.* (2002). Indoxacarb 0.0075 per cent gave highest net return (Rs. 19824/ha) followed by spinosad 0.009 per cent, profenophos + cypermethrin 0.044 per cent, endosulfan 0.07

Table 1. Effect of timing of sowing on the growth, yield and quality of eggplants

Treatments	Per cent mortality			Grain yield (kg/ha)	Net realization	C:R
	3 DAS	7 DAS	10 DAS			
Azadirachtin	66.49 (54.63)	58.81 (56.05)	63.77 (52.99)	61.25 (51.50)	60.55 (51.09)	1: 2.52
B. I @ 2 g/litre	60.73 (51.20)	63.51 (52.84)	67.06 (54.97)	53.95 (47.26)	61.51 (51.65)	1: 2.56
B. B @ 4 g/litre	57.01 (49.03)	59.77 (50.63)	64.23 (53.27)	50.64 (45.37)	58.33 (50.14)	1: 2.72
Dimethoate 0.05%	71.30 (57.61)	73.65 (59.11)	68.55 (55.89)	66.00 (54.33)	65.29 (53.91)	1: 13.94
Endosulphon 0.075%	85.76 (67.83)	88.20 (69.91)	82.95 (65.61)	80.38 (63.71)	79.66 (63.19)	1: 118.94
Imidacloprid 0.0075%	94.42 (76.24)	95.98 (78.44)	90.65 (72.19)	89.93 (71.50)	89.28 (70.81)	1: 110.07
Monocrotophos 0.05%	80.10 (63.51)	82.47 (65.25)	77.34 (61.57)	74.79 (59.86)	74.08 (59.39)	1: 117.79
Noveluron 0.01%	76.55 (61.03)	78.90 (62.65)	73.79 (59.21)	71.26 (57.58)	70.55 (57.13)	1: 116.24
Profenophos Cypromethrin (0.04/1%)	91.56 (73.11)	94.33 (76.22)	88.62 (70.29)	85.78 (67.85)	85.05 (67.25)	1: 118.11
Quinoloophos 0.05%	89.53 (66.05)	85.89 (67.99)	80.78 (63.99)	78.24 (62.19)	77.53 (61.70)	1: 115.30
Spinosad 0.0009%	92.52 (74.13)	95.23 (77.39)	89.62 (71.20)	86.51 (68.45)	85.78 (67.85)	1: 6.68
S.E. ±	2.88	3.08	2.60	2.77	2.90	14.58
C.D. @ 5%	8.32	8.89	7.52	7.99	8.37	42.01
C. V. %	9.12	9.45	8.41	9.38	9.75	10.22

Retransformed values. Figures in the parentheses are arcsin transformed values, DAS - Days after sowing

per cent, quinalphos 0.05 per cent and monocrotophos 0.05 per cent that gave net returns of Rs. 18844 to 11284/ha (Table 1). Novaluron 0.01 per cent, dimethoate 0.03 per cent, azadiractine 0.00045%, Bt @ 2 g/litre and Bb @ 4 g/litre gave relatively less net returns of Rs. 8932 to 2716/ ha. The cost: benefit ratio (Table 1) was high in the plots treated with endosulfan 0.07 per cent (1:18.94). While, it was in the range of 1:18.11 to 1:10.07 in the rest of the insecticidal treatments. The treatments *viz.*, spinosad 0.009 per cent, Bb @ 4 g/litre, Bt @ 2g/litre and azadirachtine 0.00045 per cent could not show any conspicuous gain over cost (1:6.68 to 1:2.52). Such trend of biopesticides have also been reported by Mandal and Mishra (2003). Thus, spraying with indoxacarb 0.0075 per cent, spinosad 0.009 per cent, profenophos + cypermethrin 0.044 per cent, endosulfan 0.07 per cent and monocrotophos 0.05 per cent were found most effective and economic for controlling gram pod borer incidence on pigeonpea.

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