

Efficacy of Indoxacarb and Combinations with Cypermethrin for Management of *Earias* Sp. of OKRA



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Abstract

The study was carried out to determine the efficacy of two insecticides viz., Indoxacarb, Cypermethrin, and their mixtures against shoot and fruit borer *Earias spp.* on okra variety Arka Anamika. These insecticides were tested for the control of shoot and fruit borer, *E. spp.* in *Kharif* season okra crop. Among various treatment Indoxacarb10EC+Cypermethrin10EC @100+100 g a.i./ha was found significantly superior over rest of treatment in controlling fruit damage. The next best effective treatment was Indoxacarb 10EC+Cypermethrin10EC @75+75g a.i./ha and Indoxacarb10EC+Cypermethrin 10 EC @ 50+50g a.i./ha. also effective and provided protection against fruit borer during *Kharif*. Significantly maximum yield of marketable okra was recorded from the plot sprayed with Indoxacarb 10EC+Cypermethrin10EC 17.15 q/ha.

Keywords: Okra, *Earias* spp., Indoxacarb, Cypermethrin

Introduction

Okra is one of the most important crop grown for vegetable purpose throughout the country. The crop is prone to be attacked by various insects namely; *Earias* spp., *Nezara viridula*, *Amrasca biguttulla biguttulla*, *Bemacia tabaci* that are responsible for reducing the crop yield among which shoot and fruit borer, *Earias* spp. is most serious by causing direct damage to tender fruits. Radake and Undirwade (1981) reported 88 to 100 per cent damage to fruits by fruit borer. A number of synthetic insecticides are being used for controlling pest of okra. (Mishra and Singh, 1996). In pest management strategies to achieve the desired control, various attempts are undergoing to develop more potent insecticides that could counter these insect pests but non pertains to evaluation of insecticides alone and their combinations. Hence, in the present study on novel insecticides were conducted to counter the population of insect pests of okra. Two insecticides alone at different doses and their mixtures at different doses were evaluated against shoot and fruit borer *Earias* spp.

Material and Methods

A field experiment was conducted during *kharif*, 2012 on variety Arka Anamika at Simbholi, Hapur (UP) in randomized block design with plot size of 2x3 = 6m² using appropriate agronomic practices. There are six treatments including a control and each treatment was replicated four times. Two foliar sprays of insecticides were given at an interval of 15 days starting from 5-6 leaf stage of crop with help of Knapsack sprayer using hollow cone nozzle to get uniform coverage of insecticides in each plot. Six insecticide schedules were made. (table 1). To observe the efficacy of different treatments against insect pest of okra, data were recorded on insect infestation at 7 and 15 days after each spray. For bioefficacy, all plants from each plot were observed at vegetative stage while infested and healthy fruits were counted and per cent infestation was calculated at fruiting stage. Yield was recorded from whole plant and calculated in q/h accordingly. All data were analysed in R.B.D. with help of computer.

Table1:Treatment details

Treatment No.	Treatment	Formulation dose/ha	g a.i./ha	Dilution Ltr/ha
T ₁	Indoxacarb 10+ Cypermethrin 10 SC	1.0 ltr	100+100	300
T ₂	Indoxacarb 10+ Cypermethrin 10 SC	750 ml	75+75	300
T ₃	Indoxacarb 10+ Cypermethrin 10 SC	500 ml	50+50	300
T ₄	Indoxacarb 14.5 SC	330 ml	50	300
T ₅	Cypermethrin 10 EC	500 ml	50	300
T ₆	Untreated control	-	-	300

Results and Discussion

Spraying of different treatments under investigation was started at 30 days after sowing when insects started to appear at this location. The main insect pest was *Earias* spp. Recorded as noxious though other insects like *Nezara viridula*, *Amrasca devastans* and *Bemisia tabaci* were also observed but the population was negligible.

The infestation was assessed on whole plot basis. During vegetative stage per cent infested plants were calculated and at fruiting stage per cent infestation was calculated on the basis of fruits.

Before first spraying the initial infestation ranged from 3.03 to 3.17 per cent in all plots (Table 1). Seven days after first spray the infested plants were 19.13 per cent in untreated plots. The minimum infestation was recorded in T1 (6.37 per cent). As the doses of mixed formulation decreased in T2 and T3 the infestation was increased. However cypermethrin alone had maximum infestation of 10.93 per cent plant shoots among treated all treated plots. At 15 days after first spray the fruiting was started.the fruit infestation was also minimum in T1

(2.83 per cent). Indoxacarb and cypermethrin alone (T4 and T5) treated plots had more infestation than different doses of mixed formulations though the infestation was significantly lower than untreated plots. Similar trend was also observed at 7 and 15 days after second spray.

The okra yield was significantly increase by all Indoxacarb treatments (alone or combination). The maximum yield was 40.99q/ha in T1 with 17.15 per cent increase over control (Table2).as the dose of indoxacarb + cypermethrin (premix) reduced the yield was also reduced in T2 and T3 with 40.05 and 39.27 q/ha, respectively. Cypermethrin 10 EC @50 gm a.i./ha increased yield of okra only 4.46 per cent. While indoxacarb14.5SC @ 50 gm a.i./ha increased 10.00 per cent yield.These results are in close agreement with the works of Sinha and Sharma(2008),Gupta *et al.* (2009) and Sinha *et al.*(2009).Hence,these insecticides and their combinations can be included in integrated management of shoot and fruit borer in okra ecosystem.

Table 2: Percent Infestation by *Earias* Spp. of Okra in Different Treatments at Various Time Interval at Hardeki, Saharanpur

Treatments	Per cent infestation by <i>Earias</i> spp.				
	Before I spray	7 Days after I spray	15 Days after I spray	7 Days after II spray	15 Days after II spray
T ₁ : Indoxacarb 10+ Cypermethrin 10 SC@ 100+100 gm a.i./ha	3.13	6.37	2.83	1.43	1.93
T ₂ : Indoxacarb 10+ Cypermethrin 10 SC@ 75+75 gm a.i./ha	3.07	7.17	3.87	2.56	3.00
T ₃ : Indoxacarb 10+ Cypermethrin 10 SC@ 50+50 gm a.i./ha	3.17	8.73	3.50	4.60	5.13
T ₄ : Indoxacarb 14.5 SC@ 50 gm a.i./ha	3.03	8.83	4.93	6.10	6.16
T ₅ : Cypermethrin 10 EC@ 50 gm a.i./ha	3.10	10.93	5.33	6.73	8.07
T ₆ : Untreated control	3.07	19.13	14.57	14.60	16.27
F- test	NS	Sig.	Sig.	Sig.	Sig.
CD at 5%	0.39	1.85	0.69	1.02	1.01

Table 3: Yield, Percent Increase in Yield of Okra in Different Treatments at Hardeki, Saharanpur

Treatments	Yield (q./ha.)	Per cent increase in yield over untreated control
T ₁ : Indoxacarb 10+ Cypermethrin 10 SC@ 100+100 gm a.i./ha	40.99	17.15
T ₂ : Indoxacarb 10+ Cypermethrin 10 SC@ 75+75 gm a.i./ha	40.05	14.46
T ₃ : Indoxacarb 10+ Cypermethrin 10 SC@ 50+50 gm a.i./ha	39.27	12.78
T ₄ : Indoxacarb 14.5 SC@ 50 gm a.i./ha	38.49	10.00
T ₅ : Cypermethrin 10 EC@ 50 gm a.i./ha	36.55	4.46
T ₆ : Untreated control	34.99	--
F- Test	Sig.	--
CD at 5%	2.48	--

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