The Pharma Innovation Journal 2022; 11(4): 1575-1578

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; 11(4): 1575-1578

www.thepharmajournal.com
Received: 06-01-2022
Accepted: 13-02-2022

Koppula Madhuri
Researcher, Department of Entomology, Sam Higginbottom University of Agriculture, Technology & Sciences, Prayagraj, Uttar Pradesh India

Ashwani Kumar
Professor, Department of Entomology, Sam Higginbottom University of Agriculture, Technology & Sciences, Prayagraj, Uttar Pradesh India

Corresponding Author:
Koppula Madhuri
Researcher, Department of Entomology, Sam Higginbottom University of Agriculture, Technology & Sciences, Prayagraj, Uttar Pradesh India

To study the field efficacy of certain chemicals and neem oil against shoot and fruit borer *Earias vittella* (Fabricius) on okra

Koppula Madhuri and Ashwani Kumar

Abstract
The field trial was conducted at Central Research Field, Department of Entomology, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj during kharif season 2021 investigation entitled "To study the field efficacy of certain chemicals and neem oil against shoot and fruit borer *Earias vittella* (Fabricius) on okra" Seven treatments were evaluated against, *Earias vittella* i.e., T_1Spinosad 45% SC, T_2 Lambda-cyhalothrin 2.5 EC, T_3 Flubendiamide 480 SC, T_4 Profenophos 50 EC, T_5 Neem oil 0.03% EC T_6 Emamectin benzoate5%SG, T_7 Cypermethrin 25%EC and T_8 Control. When the benefit cost ratio was worked out, interesting results was achieved. Among the treatment studied the best and most economical treatment was T_1 Spinosad 45% SC (1:6.05), T_3 Flubendiamide 480 SC (1:4.68), T_7 Cypermethrin 25%EC (1:4.64), T_2 Lambda-cyhalothrin 2.5 EC (1:4.50), T_6 Emamectin benzoate5%SG (1:4.32), T_4 Profenophos 50 EC (1:3.97) and T_5 Neem oil (1:3.47) as compared to T_0 control (1:3.08).

Keywords: Benefit cost ratio, *Earias vittella*, insecticide, Okra shoot and fruit borer

Introduction

Okra (Lady finger or bhendi), *Abelmoschus esculentus* (L.) Moench is cultivated in India mainly for its immature fruits. Okra fruits have nutritious as well as dietary value. Though, it is mainly used as a fresh vegetable, it is also consumed as canned, dehydrated or frozen forms (Schippers, 2002).

Among vegetables, it occupies an important position and is grown extensively throughout India. In Uttar Pradesh, okra grown in an area of 11.6 thousand hectare with the production of 131.2 thousand tones per hectare (Indian Horticultural Database, 2011).

The crop, however, is vulnerable to attack of important insect pests, among which fruit borer *Earias vittella* (Fabricius) is the most important pest causing direct damage to marketable fruits. It alone is reported to cause 57.1 per cent fruit infestation and 54.04 per cent net yield loss in okra (Chaudhary and Dadheech, 1989).

Earias vittella damage to okra crop is done by two ways. First, the terminal portion of growing shoots is bored by caterpillars, which move down by making tunnels inside. As a result, the shoot drop downward or dry up. Second, the larvae enter the fruit by making holes, rendering them unfit for human consumption. According to an estimate this pest can cause 36-90% loss in fruit yield of okra (Misra *et al*., 2002) [5].

The total area and production under okra in the world is reported to be 1.26 million ha and 22.29 million tonnes, respectively. It is mainly grown in India, Nigeria, Sudan, Pakistan, Ghana, Egypt, Saudi Arabia, Mexico and Cameroon. India ranks first in okra production 5784.0 thousand tonnes (72% of total world production) having area of 1148.0 thousand hectares with an annual production of 6346 million tonnes and productivity of 11.9 million tonnes/ha. The crop is grown throughout India, Andhra Pradesh is the leading okra producing state which has production of around 1184.2 thousand tons from an area of 78.90 thousand ha, with a productivity of 15 tons / ha. It is followed by west Bengal (862.1 thousand tonnes from 74.00 thousand with 11.70 tonnes/ ha productivity. In Uttar Pradesh area, production and productivity of okra is 12.19 ha, 148.64 tonnes, 12.2 metric tons per hectare (National Horticulture Board 2018-19).

The major okra growing states in India includes Andhra Pradesh (20%), West Bengal (15%), Bihar (14%), Orissa (11%), Gujarat (10%), Jharkhand (7%), Maharashtra (4%), Assam (3%) and Haryana (3%) (Anonymous, 2012).

The sucking pest complex of okra consisting of aphids, leaf hoppers, whiteflies, thrips and mites causes 17.46% yield loss and failure to control them in initial stages was reported to cause 54.04% yield loss (Chaudhary and Daderch, 1989).

Materials and Methods

The present study on, To study the field efficacy of certain chemicals and neem oil against shoot and fruit borer, [*Earias vittella* (Fabricius)] on okra will be conducted under the field condition during Kharif 2021.

Experimental site

The experiment will be conducted during kharif season 2021 at Central Research Field, Department of Entomology, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj, India, in a randomized block design with eight treatments replicated three times using variety GR-51(green regnum) seeds in a plot size of 2m×2m at a spacing of 45cm × 30cm with a recommended package of practices excluding plant protection. The soil of the experimental site was well drained and medium high.

Climate & Topography

The climate of the experimental site is sub-tropical characterized by normal rainfall. Naini is situated at 25.22'45.1"N North Latitude 81.52'37.44'' East Longitude of 95.63 meter above sea level. The climate at Prayagraj is sub-tropical which prevails in the eastern part of U.P. The extremes of both summer and winter are experienced while the minimum temperature in winter may 4 ºC and the maximum temperature reaches up to 45 ºC in summer.

Method of Recording Observation

Efficacy of treatments

The population of okra shoot and fruit borer was recorded before 1- day spraying and on 3rd day, 7th day and 14th day after insecticidal application. The populations of okra shoot and fruit borer was recorded on 5 randomly selected and tagged plants from each plot and then it was converted into per cent of infestation by following formula.

On Shoot

At each picking the total number of shoots and number of shoots infested of five selected plants from each treatment replication wise was recorded.

$$\% \text{ Shoot infestation} = \frac{\text{No. of shoot infested}}{\text{Total no. of shoot}} \times 100$$

On Fruit

At each picking the total number of fruits and number of fruits infested of five selected plants from each treatment replication wise was recorded.

$$\text{Fruit infestation} = \frac{\text{No. of fruit infested}}{\text{Total no. of fruit}} \times 100$$

Treatments No.	Treatments	Dosages Gm/ml/lit
T_1	Spinosad 45% SC	0.3-0.4ml/lit
T_2	Lambda-cyhalothrin 2.5 EC	0.5-1ml/lit
T_3	Flubendiamide 480 SC	0.3ml/lit
T_4	Profenophos 50 EC	2ml/lit
T_5	Neem oil 0.03% EC	2ml/lit
T_6	Emamectin benzoate 5% SG	0.4g/lit
T_7	Cypermethrin 25% EC	2ml/lit
T_0	Control	-

Results and Discussion

The results of the experiment entitled, "To study the field efficacy of certain chemicals and neem oil against shoot and fruit borer, *Earias vittella (*Fabricius) on okra" to study cost benefit ratio during *Kharif* season of 2021. The data so obtained through observation on various aspects were subjected to statistical analysis wherever necessary and the compiled mean data are tabulated in the following pages. Results obtained are presented aspect wise here under.

Shoot infestation

A mong all the treatments lowest per cent shoot, infestation was recorded T_1 Spinosad 45% SC (5.22), T_3 Flubendiamide 480 SC (11.68), T_7 Cypermethrin 25%EC (13.39), T_2 Lambda-cyhalothrin 2.5 EC (16.81), T_6 Emamectin benzoate5%SG (17.44), T_4 Profenophos 50 EC (19.25) and T_5 Neem oil (20.67) is found to be least effective than all the treatments and is significantly superior over the control (25.61).

Fruit infestation

The data on the percent infestation of shoot and fruit borer on okra 3rd, 7th and 14th day after second spray revealed that all the chemical treatments were significantly superior over control. A mong all the treatments lowest per cent shoot, infestation was recorded T_1 Spinosad 45% SC (5.85), T_3 Flubendiamide 480 SC (12.37), T_7 Cypermethrin 25%EC (14.57), T_2 Lambda-cyhalothrin 2.5 EC (15.51), T_6 Emamectin benzoate5%SG (16.06), T_4 Profenophos 50 EC (17.43) and T_5 Neem oil (18.63) is found to be least effective than all the treatments and is significantly superior over the control (25.40).

Table 1: To study the field efficacy of certain chemicals and neem oil against shoot and fruit borer, [*Earias vittella (*Fabricius)] on okra (First Spray): (Percent shoot infestation).

Treatments		Percent shoots infestation of *E. vittella*				
		One day before spray	After spray			
			3 DAS	7 DAS	14 DAS	Mean
T_1	Spinosad 45% SC	16.51	4.06	3.81	7.79	5.22
T_2	Lambda-cyhalothrin 2.5 EC	19.48	16.23	16.90	17.3	16.81
T_3	Flubendiamide 480 SC	15.86	11.45	11.73	11.87	11.68
T_4	Profenophos 50 EC	20.24	18.63	19.40	19.74	19.25
T_5	Neem oil 0.03% EC	20.67	21.04	20.53	20.45	20.67
T_6	Emamectin benzoate5%SG	17.75	16.44	17.76	18.14	17.44
T_7	Cypermethrin 25%EC	15.72	12.92	12.08	15.19	13.39
T_0	Control	21.20	23.67	25.79	27.38	25.61

Overall Mean	18.42	15.55	16	17.23	16.80
F- test	NS	S	S	S	S
S. Ed. (±)	-	0.59	0.67	0.59	0.68
C. D. (P = 0.05)	-	1.75	2.02	1.71	1.69

Table 2: To study the field efficacy of certain chemical and neem oil against shoot and fruit borer, *Earias vittella (*Fabricius) on okra (Second spray): (Percent Fruit infestation).

Treatments		Percent fruits infestation of *E. vittella*				
		One day before spray	After spray			
			3 DAS	7 DAS	14 DAS	Mean
T_1	Spinosad 45% SC	15.52	5.42	4.45	7.70	5.85
T_2	Lambda-cyhalothrin 2.5 EC	17.26	14.32	15.55	16.67	15.51
T_3	Flubendiamide 480 SC	20.25	11.47	10.81	14.85	12.37
T_4	Profenophos 50 EC	19.48	16.40	17.47	18.42	17.43
T_5	Neem oil 0.03% EC	20.24	18.18	17.72	19.99	18.63
T_6	Emamectin benzoate 5% SG	19.07	14.95	15.89	17.34	16.06
T_7	Cypermethrin 25% EC	16.90	14.29	13.43	16.00	14.57
T_0	Control	20.97	23.03	25.01	28.16	25.40
Overall Mean		18.71	14.75	15.04	17.39	16.47
F- test		NS	S	S	S	S
S. Ed. (±)		-	1.01	1.01	0.73	0.64
C. D. (P = 0.05)		-	3.16	3.11	2.14	1.39

Table 3: Table representation of to study the field efficacy of certain chemical and neem oil against shoot and fruit borer, [*Earias vittella* (Fabricius)] on okra on Economics and cost of benefit ratio of okra

Treatment Symbols	Yield (q/ha)	Cost of yield (RS/q)	Gross return (RS)	Total cost of cultivation (RS)	Net return (RS)	B:C Ratio
T_1	196.5	1850	363525	60061	357464	1:6.05
T_2	136.3	1850	252155	55941	196214	1:4.50
T_3	150.4	1850	278240	59361	218879	1:4.68
T_4	120.2	1850	222370	55901	166469	1:3.97
T_5	105.3	1850	194805	56033	138772	1:3.47
T_6	130.18	1850	240833	55701	185132	1:4.32
T_7	140.2	1850	259370	55801	203569	1:4.64
T_0	92.2	1850	170570	55301	115269	1:3.08

Conclusion

From the above discussion it was found that, spraying of insecticides significantly reduced the shoot and fruit borer percent infestation in okra. The present findings conclude that the new generation insecticides like T_1Spinosad 45% SC (0.3-0.4ml/lit) T_2 Lambda-cyhalothrin 2.5 EC (0.5-1ml/lit) T_3 Flubendiamide 480 SC (0.3ml/lit) T_4 Profenophos 50 EC (2ml/lit) T_5 Neem oil 0.03% EC (2ml/lit) T_6 Emamectin benzoate5%SG (0.4g/lit) T_7 Cypermethrin 25%EC (2ml/lit) and treatment of untreated control plant T_0 were found effective against shoot and fruit borer of okra *Earias vittella.* Further, it was observed that the cost benefit ratio was also high with T_1 Spinosad 45% SC and T_3 Flubendiamide 480 SC. Hence, it is suggested that the effective insecticides may be alternated in harmony with the existing Intergrated pest management programes in order to avoid the problems associated with insecticidal resistance, pest resurgence etc.

Reference

1. Anitha KR, Nandihali BS. Seasonal incidence of sucking pests in okra ecosystem. Karnataka Journal of Agricultural Science. 2008;21:137-38.
2. Dash L, Ramalakshmi V, Padhy D. Bio-efficacy of emamectin benzoate 5% SG against shoot and fruit borer *Earias vitella* (Fabricius) on okra. The Pharma Innovation Journal. 2020;9(12):144-146.
3. Kanchan Padwal G, Kumar A. Efficacy of plant products and combinations with cypermethrin in management of *Earias vittella* of Okra. Annals of Plant Protection. Science. 2014;22(1):73-75.
4. Kumar P, Singh DV, Dabas JPS, Sachan K, Kumar M. Assessment the Efficacy and Economic of Insecticides And Bio-Pesticides Against Major Insect Pests of Okra (*Abelmoschus esculentus*). International Journal of Agriculture Sciences. 2016;48(8):2050-2052.
5. Misra HP. Field evaluation of some newer insecticides against aphid (*Aphis gossypii*) and jassid (Amrasca biguttula biguttula) on okra. Indian Journal of Entomology. 2002;64:80-84.
6. Naidu G, Kumar A. Field efficacy of certain insecticides against shoot and fruit borer (*Earias vittella* Fab.) on rainy season okra in Prayagraj (U.P.). Journal of Entomology and Zoology Studies. 2019;7(6):1211-1213.
7. Rakshith KA, Kumar A. Field Efficacy of Selected Insecticides and Neem Products against Shoot and Fruit Borer [*Earias vittella* (Fabricius)] on Okra [*Abelmoschus esculentus* (L.) Moench]'. International Journal of Current Microbiology and Applied Science. 2017;6(8):122-128
8. Singh GP, Yadav Ramkewal, Singh RS, Vikrant. Effect of Certain Eco-Friendly Insecticides on *Earias vittella* (Major Insect) Of Okra Crop in Central Region of Uttar Pradesh, India. Plant Archives. 2017;17(1):135-140.
9. Srivastava N, Srivastava AK, Alok M, Gupta P, Singh SK. Efficacy of Selected Insecticides And Neem Oil Against Shoot and Fruit Borer (*Earias vittella* fab.) Onokra (*Abelmoschus Esculentus* L.). International journal of pharmacy and life sciences (Ijpls).

2014;5(12):4096- 4099.
10. Roy A, Shrivastava SK, Mandal SM. Functional properties of okra Abelmoschus esculentus L. (Moench): traditional claims and scientific evidences.' Plant Science Toda. 2014;1(3):121-130.