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Bio-efficacy of insecticides for the management of cashew thrips (*Scirtotrips dorsalis* Hood.) under south Konkan coastal region of Maharashtra

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Abstract

Cashew (*Anacardium occidentale* L.) is one of the important cash crops grown in Konkan region of Maharashtra. Cashew flower thrips (*Scirtotrips dorsalis* Hood.) is one of the important pests of cashew influencing the yield and quality of cashew nut. The experiments were carried out at Regional Fruit Research Station, Vengurla for management of cashew thrips during 2012-13 to 2014-15. Among the different insecticides tested against cashew thrips, 0.003 per cent Lambda cyhalothrin (three sprays) was observed to be the most effective with the least per cent incidence (2.15%) followed by a treatment comprising three sprays of different insecticides (Monocrotophos 0.05 per cent at flushing, Profenophos 0.05 per cent at flowering and Lambda cyhalothrin 0.003 per cent at fruit and nut development stage).

Keywords: Cashew, thrips, management, bio-efficacy, *Scirtotrips dorsalis*

1. Introduction

Cashew is one of the most important commercial crops grown in India. Earlier cashew was grown for reducing soil erosion but, now days it has become a dollar earner crop of India. The productivity of cashew crop is influenced by many factors; among which the incidence of insect pest is the major one causing crop loss of 30 to 40 per cent^[1]. It has been reported that 180 insect and non-insect pests causing substantial yield losses in cashew crop^[2]. The cashew crop is infested by 170 insect species in Ghana^[3] and 58 insect pests in the Konkan region of Maharashtra^[4]. However, only stem and root borer (*Placaederus ferrugineus* L.), cashew tea mosquito bug (*Helopeltis antonii* Sign.), and cashew flower thrips (*Scirtotrips dorsalis* Hood.) are the major pests of cashew in Konkan region of Maharashtra^[5].

Among the sucking pests of cashew the flower thrips has become a serious threat now a day. About six species of thrips are known to attack cashew in India; out of which four species viz., *Scirtotrips dorsalis* Hood., *Thrips hawaiiensis* Morgan., *Selenothrips rubrocinctus* Giard and *Haplothrips tenuipennis* Bagnal have been recorded infesting cashew in Konkan region of Maharashtra^[6]. *S. dorsalis* is the predominant species of cashew thrips in Konkan region^[7]. The adult and nymphs of thrips are observed in colonies on the lower surface of leaves. As a result of their rasping and sucking activity the leaves become pale brown and slightly crinkled with roughening of leaf surface. They also lacerate the flowers, panicles, apples and nuts. As a result, the flowers turn brownish and there is flower drop which ultimately affect the fruit setting.

Due to voracious feeding by huge number of thrips the apples and nuts become corky, remain under sized with shabby appearance. The thrips alone accounts for 16.39 per cent fruit drop^[8]. Keeping in view, the present study aims to evaluate the efficacy of certain chemical insecticide against cashew flower thrips (*S. dorsalis*) in order to identify the effective insecticide for management.

2. Material and Methods

Field experiments were conducted during 2012-13 to 2014-15 at Regional Fruit Research Station, Vengurla.

Treatment details	
T ₁	- First spray of neem oil soap (4%) at flushing stage followed by spray of lambda cyhalothrin 5EC (0.003%) at flowering stage followed by spray of neem oil soap at fruit setting.
T ₂	- Imidacloprid 17.8 SL (0.01%) (all three spray).
T ₃	- Acetamiprid 20 SP (0.01%) (all three spray).
T ₄	- Lambda cyhalothrin 5 EC (0.003%) (all three spray).
T ₅	- Monocrotophos (0.05%) at flushing, Profenophos (0.05%) at flowering and Lambda cyhalothrin (0.003%) at fruit & nut development stage.
T ₆	- Untreated control

2.1 Method of recording observations

For recording per cent incidence of thrips (corky growth or presence of scabs) 100 nuts as well as apples per tree were selected randomly and recorded damage score in 0-4 scale [5] as given below.

0	No damage
1	1-25 per cent nut or apple surface damaged (up to 1/4 of the damaged surface area)
2	26-50 per cent nut or apple surface damaged (up to 1/2 of the damaged surface area)
3	51-75 per cent nut or apple surface damaged (up to 3/4 of the damaged surface area)
4	76-100 per cent nut or apple surface damaged (more than 3/4 of the damaged surface area)

The recorded data were converted into per cent incidence on the basis of formula given below,

$$\text{Percent incidence} = \frac{\text{Sum of all numerical ratings}}{\text{No. of shoots observed} \times \text{maximum rating}} \times 100$$

2.2. Stastical Analysis

The per cent incidence data were subjected to statistical analysis using analysis of variance [9].

3. Results and Discussion

The data on per cent incidence of flower thrips 30 days after last spray recorded during 2012-13, 2013-14, 2014-15 and the pooled data are presented in Table 1. From the data it is revealed that during the year 2012-13, all the insecticide treatments were significantly superior over control. Among the different insecticide treatments studied, the treatment T₄ (lambda cyhalothrin 0.003%) recorded significantly lowest incidence of cashew flower thrips (1.95%) after last spray. However, it was at par with treatment T₅ (monocrotophos 0.05% at flushing, profenophos 0.05% at flowering and lambda cyhalothrin 0.003% at fruit & nut development stage). During the year 2013-14, the incidence of thrips ranged between 1.56 to 4.66 percent among the different insecticide treatments. All the insecticide treatments were significantly superior over control. The treatment T₃ (acetamiprid 0.01%) was found to be the best treatment for the management of

thrips with least incidence of flower thrips (1.56%). However, it was at par with T₄(lambda cyhalothrin 0.003%), T₅ (monocrotophos 0.05% at flushing, profenophos 0.05% at flowering and lambda cyhalothrin 0.003% at fruit & nut development stage) and T₁(first spray of neem oil soap 4% at flushing followed by lambda cyhalothrin 0.003% at flowering followed by neem oil soap at fruiting stage).

During the year 2014-15, all the insecticide treatments were significantly superior over control. The treatment T₄ (lambda cyhalothrin 0.003%) was found most effective for the management of cashew flower thrips with only 1.74 per cent incidence. However, it was at par with T₂ (imidacloprid 0.01%), T₁ (first spray of neem oil soap 4% at flushing followed by lambda cyhalothrin 0.003% at flowering followed by neem oil soap at fruiting stage) and T₅(monocrotophos 0.05% at flushing, profenophos 0.05% at flowering and lambda cyhalothrin 0.003% at fruit & nut development stage).

The data on pooled mean of three years is presented in Table 1 and shows non-significant result. From the mean it is evident that all the insecticide treatments reduced the incidence of flower thrips over control. The treatment T₄ (lambda cyhalothrin 0.003%) was most effective with only 2.15 per cent thrip damage; followed by the treatment, T₅ (monocrotophos 0.05% at flushing profenophos 0.05% at flowering and lambda cyhalothrin 0.003% at fruit & nut development stage) and T₃ (acetamiprid 0.01%).

Many earlier research workers have studied the efficacy of different insecticides for management of cashew thrips. Godase and co-workers studied the bioefficacy of monocrotophos, carbaryl and endosulfan against cashew thrips and reported monocrotophos 36 SL (0.05%) as the most effective insecticide [4].

The present findings are in close conformity with Jalgaonkar [10] and Mahapatro [11] who reported lambda cyhalothrin 5 EC (0.003%) as most effective insecticide against cashew thrips. Similarly, Navik and co-workers reported the efficacy of lambda cyhalothrin 5 EC (0.003 %) and fipronil 5 EC (0.005%) against cashew thrips [12]. Also, Jadhav and co-workers reported the efficacy of lambda cyhalothrin 5 EC against chilli thrips [13].

Table 1: Efficacy of different insecticides against cashew flower thrips

Treatments		Per cent incidence of flower thrips 30 days after last spray during			
		2012-13	2013-14	2014-15	Pooled mean
T ₁	First spray of Neem oil soap (4%) at flushing followed by Lambdacyhalothrin 5 EC (0.003%) at flowering followed by Neem oil soap at fruiting stage.	12.88 (21.03)	3.00 (9.85)	2.52 (8.90)	6.13 (13.28)
T ₂	Imidachloprid 17.8 SL (0.01%) all three spray	8.13 (16.65)	3.42 (10.47)	2.34 (8.65)	4.63 (11.92)
T ₃	Acetamiprid 20 SP (0.01%) all three spray	7.93 (16.22)	1.56 (6.44)	3.06 (10.04)	4.18 (10.90)
T ₄	Lambdacyhalothrin 5 EC (0.003%) all three spray	1.95 (7.52)	2.76 (8.59)	1.74 (7.14)	2.15 (7.75)
T ₅	Monocrotophos (0.05%) at flushing, Profenophos (0.05%) at flowering and	4.48	3.17	2.64	3.43

	Lambdacyhalothrin (0.003%) at fruit & nut development stage.	(12.17)	(9.63)	(9.25)	(10.35)
T ₆	Untreated control	25.05 (29.62)	4.46 (12.73)	5.04 (12.83)	11.51 (18.40)
	SEm±	1.68	1.24	0.80	2.12
	CD at 5%	5.07	3.74	2.42	N.S

(* figures in parenthesis are arc sine transformed values)

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