Research Paper :

Study on evaluation of different insecticides against leaf eating caterpillar (*Thalossades dissita* Walker) on mango and cashew

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International Journal of Plant Protection (October, 2010), Vol. 3 No. 2 : 170-173

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SUMMARY

The *Thalassodes dissita* Walker is very common on both the Mango and cashew crops this was considered to be a minor pest in the past. However, in recent days, it is becoming regular pest causing considerable damage to the tender foliage of nursery seedlings and grafts. The infestation is also severe in bud wood orchards and young plantations on tender vegetative flush during rainy season.

Key words : *Thalassodes dissita, Anacardium occidentale Mangifera indica*

Accepted :
April, 2010

Mango (*Mangifera indica* L.) belonging to family Anacardiaceae universally considered as the most delicious tropical fruit of the world and has been called 'King of fruits'. It is also a 'National fruit of India'. Mango is grown in atleast 111 countries spread over five continents. India ranks first in world with total production of 10.8 million metric tons from about 1.6 million hectare area, which is nearly fourty three per cent, the total world area under mango (FAO, 2006).

The cashew nut (*Anacardium occidentale* L.) is a native of south eastern Brazil belongs to the family Anacardiaceae. It was introduced in sixteenth century by the Portuguese on west coast of India mainly to check the soil erosion (Murthy and Ramadevi, 1985).

Several pests have been reported on these crops affecting the productivity greatly. Mango alone has been reported to be infested by 551 pests in the different parts of the world which includes 492 species of insects, 17 species of mites, 26 species of nematodes,9 species of birds and 7 species of mammals (Tandon and Verghese,1985) whereas, cashew crop has been reported to be infested by 180 pests in India including insects,mites and vertebrates (Sundararaju and Bhaktavathsalam, 1990). Among the several leaf eating caterpillars feeding on these crops. The *Thalassodes dissita* Walker is very common on both the crops. This was considered to be a minor pest in the past. However, in recent days, it is becoming regular pest causing considerable damage to the tender foliage of nursery seedlings and grafts. The infestation is also severe in bud wood orchards and young plantations on tender vegetative flush during rainy season.

Therefore, keeping the above facts in view the present investigation was aimed to study effect of different insecticides against *Thalassodes dissita* on mango and cashew.

MATERIALS AND METHODS

The experiment was laid out in a Randomised Block Design with three replications and ten treatments were arranged experiments units at random.

To determine the relative efficacy of different insecticides against leaf eating caterpillar, *Thalassodes dissita* the experiment was conducted under laboratory condition at the Department of Agril. Entomology, College of Agriculture, Dapoli during *Kharif* 2007-2008.

Details of insecticidal treatment are given in Table 1.

Method of insecticidal treatment:

The pesticide solutions were prepared with desired concentration as mentioned in treatment details. One litre quantity of pesticide

Table 1 : Details of insecticides evaluated against *Thalassodes dissita* Walker

Sr. No.	Common name	Trade name	Formulation	Concentration used (%)	Source
1.	Endosulfan	Endocel	35 EC	0.05	Excel Crop Care Ltd.
2.	Quinalphos	Ekalux	25 EC	0.05	Syngenta India Ltd.
3.	Carbaryl	Sevin	50 WDP	0.15	Bayer Crop Science Ltd.
4.	Emamectin benzoate	Proclaim	5 SG	0.0016	Syngenta India Ltd.
5.	Spinosad	Tracer	45 EC	0.016	Dow Agro Sciences India Pvt. Ltd.
6.	Lamda cyahalothrin	Karate	5 EC	0.005	Syngenta India Ltd.
7.	Cypermethrin	Cymbush	25 EC	0.0075	Syngenta India Ltd.
8.	Methyl parathion	Folidol dust	2 D	2.0	Bayer Crop Science Ltd.
9.	Neem formulation	Trishul	300 ppm	2.0	Ozane Biotech
10.	Control	-	-	-	-

solutions was poured in rectangular glass jar of volume 1250 ml. The fresh,tender leaves of mango were collected from bud wood orchards. The leaves were dipped in the pesticide solution and then dried under fan in the laboratory.

After drying, the treated leaves were placed in the Petridish of 15 cm diameter. Five uniform size third instar larvae were released on the treated leaves in each Petridish. Total twenty larvae were released on treated leaves per treatment per replication for subsequent feeding untreated leaves were provided second day onwards, the food was changed daily. Observations on larval mortality were recorded at 1, 3, 5 and 7 days after treatments. The data on mortality in respective treatments were subjected to arcsine transformation before analysis.

RESULTS AND DISCUSSION

Results on efficacy of some insecticide against the leaf eating caterpillar *T. dissita* are presented in Table 2. The results indicated that all the insecticides tested were significantly superior over control in causing larval mortality 1,3,5,and 7 days after application of insecticides. Post treatment observations recrded at one day after application of the insecticides revealed that the treatments with 0.0016 per cent emamectin benzoate alone showed the knockdown effect with 100 per cent mortality and found significantly superior over rest of the treatments. The insecticide λ- cyhalothrin 0.005 per cent though observed significantly inferior to emamectin benzoate, (0.0016 %) proved to be the next best treatment with 90 per cent larval mortality. However, it was at par with 0.05 per cent quinalphos and cabaryl, both having 80 per cent larval mortality and significantly superior over remaining treatments. On the other hand the treatment of quinalphos 0.05 % and carbaryl (0.15 %) were also at par with spinosad (0.016 %) and cypermethrin (0.0075 %) and significantly superior over treatments of methyl parathion, neem formulation and endosulfan. Among the insecticidal treatments, endosulfan 0.05 per cent found to be the least effective with just 28.33 per cent larval mortality followed by neem formulations with 38.33 per cent larval mortality.

The cumulative larval mortality recorded at third day after application of insecticide indicated that all the insecticidal treatment remained significantly effective over the control. However, the treatments 0.05 per cent quinalphos, 0.0016 per cent emamectin benzoate and 0.005 per cent λ- cyhalothrin showed 100 per cent mortality and observed equally effective and significantly superior over rest of the treatments. The treatments with 0.15 per cent carbaryl, 0.016 % spinosad and 0.0075 % cypermethrin gave 96.67, 91.67 and 91.67 larval mortality, respectively and were found equally effective as the significant difference dose not existed among them. Among the remaining treatments, neem pesticide recorded the lowest mortality of 45 per cent which was significantly inferior to all other treatments. The treatment of methyl parathion and endosulfan was found comparatively less effective with 80 and 86.7 per cent larval mortality, respectively. The observations recorded fifth day after application of the insecticides indicated that all the insecticidal treatments remained significantly effective over control.

The treatments with 0.05 per cent quinalphos, 0.15 per cent carbaryl, 0.0016 per cent emamectin benzoate and 0.005 per cent λ- cyhalothrin showed 100 per cent larval mortality and proved their superiority over all other treatments followed by treatments of 0.015 per cent spinosad, 0.0075 per cent cypermethrin and 0.05 per cent endosulfan recorded more than 90 per cent larval mortality and found equally effective in causing larval mortality. The neem pesticide recorded only 48.33 per cent cumulative larval mortality and found least effective among all the pesticide tested. Seven days after application

Table 2 : Evaluation of different insecticides against *T. dissita*

Sr. No.	Treatments	Concentration used	Mean per cent larval mortality*			
			1 DAT	3 DAT	5 DAT	7 DAT
1.	Endosulfan 35 EC	0.05	28.33	86.67	90.00	90.00
			(32.16)**	(68.58)	(71.57)	(71.57)
2.	Quinalphos 25 EC	0.05	80.00	100.00	100.00	100.00
			(63.43)	(90.00)	(90.00)	(90.00)
3.	Carbaryl 50 WDP	0.15	80.00	96.67	100.00	100.00
			(63.43)	(79.48)	(90.00)	(90.00)
4.	Emamectin benzoate 5 SG	0.0016	100.00	100.00	100.00	100.00
			(90.00)	(90.00)	(90.00)	(90.00)
5.	Spinosad 45 EC	0.016	68.33	91.67	96.67	96.67
			(55.76)	(73.22)	(79.48)	(79.48)
6.	Lamda cyahalothrin 5 EC	0.005	90.00	100.00	100.00	100.00
			(71.57)	(90.00)	(90.00)	(90.00)
7.	Cypermethrin 25 EC	0.0075	68.33	91.67	91.67	91.67
			(55.76)	(73.22)	(73.22)	(73.22)
8.	Methyl parathion 2 D	2.0	60.00	80.00	81.67	81.67
			(50.77)	(63.43)	(64.65)	(64.65)
9.	Neem formulation 300 ppm	2.0	38.33	45.00	48.33	48.33
			(38.25)	(42.13)	(44.04)	(44.04)
10.	Control	-	1.67	5.00	10.00	10.00
			(7.42)	(12.92)	(18.43)	(18.43)
	S.E. ±		3.46	2.90	2.74	2.74
	C.D. (P=0.05)		10.30	8.62	8.14	8.14

** Figures in the parenthesis are arcsine value DAT- Days after treatment

almost similar results were obtained as that of fifth day.

During the present study, treatment of 0.016 per cent emamectin benzoate was observed to be the most effective as it gave knockdown effect with 100 per cent larval mortality a day after application. However, considering the overall cumulative mortality five days after application the treatments emamectin benzoate 0.0016 per cent, quinalphos 0.05 per cent, carbaryl 0.15 per cent and λ- cyhalothrin 0.005 per cent were emerged as most effective treatment for the control of leaf eating caterpillar, *T. dissita.*

Emamectin benzoate has already been reported effective against many lepidopteran pests (Murugaraj *et al.,* 2006 and Prasadkumar and Devappa, 2006) which is confirmed by present findings. The pesticide quinalphos (0.005 %) was also found effective during present investigation which was earlier reported to be effective against leaf feeding pest of cashew (Sundararaju and Bhaktavathsalam, 1990) and leaf eating caterpillars of mango (Shrivastava,1997). Similarly the effectiveness of carbaryl 0.15 per cent against various leaf defoliating pests of cashew was reported by Sathiamma (1978) and Ramadevi and Krishnamurthy (1983) whereas Bhole *et al.,* 1987 reported 0.015 per cent carbaryl comparatively least effective treatment against mango nursery pests including *T. dissita* which is contradicting to the present findings. The effectiveness of λ- cyhalothrin was reported by Sureshkumar *et al*. (2004) against shoot tip caterpillar of cashew, which was found again effective during present study. Similarly, Subba Rao *et al.* (2006) observed spinosad was effective treatment for shoot tip caterpillar of cashew which is in conformity with present findings. The neem pesticide reported to be comparatively least effective against shoot tip and inflorescens caterpillar on cashew, which is confirmed by present results (Subba Rao *et al*., 2006).

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