

## Section II

### Bee Poisoning, Environmental Toxicology, Regulatory Issues

#### **DETERRENCE OF SHOOT AND CAPSULE BORER *CONOGETHES PUNCTIFERALIS* GUENEE AND THIRPS *SCIOTHRIPS CARDAMOMI* RAMK. OF SMALL CARDAMOM BY CERTAIN NEEM FORMULATIONS**

D. Rajabaskar and A.Regupathy<sup>1</sup>

Department of Entomology, Tamil Nadu Agricultural University,  
Coimbatore, India-641003, India

<sup>1</sup>Present address: Plant Protection Consultant, 31, Revathy Nagar, P.N.Pudur Post,  
Coimbatore- 641 041, India,

E.mail: [regupathya@yahoo.com](mailto:regupathya@yahoo.com); [rajabaskard@yahoo.co.in](mailto:rajabaskard@yahoo.co.in)

Considerable damage is done to cardamom by thrips *Sciothrips cardamomi* Ramk. and shoot and capsule borer *Conogethes punctiferalis* Guenee) in India. For management of insect pests, major focus falls on chemical insecticides. Effect of pesticides on bees assumes special significance in cardamom where pollination by bees is of tremendous importance. For effective use of ecofriendly neem, feeding and ovipositional deterrence effects of neem were evaluated against *C. punctiferalis* and *S. cardamomi*.

The settling response of *C. punctiferalis* and *S. cardamomi*, oviposition deterrence of different neem formulations were assessed by multiple and dual choice tests. Cardamom capsules (50 gram) treated with different neem formulations (Nimbecidine containing 0.03 % azadirachtin and Nimbecidine containing 0.15 % azadirachtin of T.Stanes Pvt.India Ltd, NeemAzal containing 1.0 % azadirachtin and NeemAzal containing 5.0 % azadirachtin of EID Parry Pvt.India Ltd. and TNAU neem EC containing 0.03 % azadirachtin developed by Tamil Nadu Agricultural University) diluting @ 2ml/litre of water. Batches of 50 and 25 pre-starved *C. punctiferalis* larvae for three hours and batches 25 and 10 *S. cardamomi* nymphs were used in multi and dual choice tests respectively. The number of larva/ nymphs settled 24hr after release were recorded. Two plastic tea strainers put in a juxta position (8cm dia.) containing cardamom capsule as odor source wrapped with cotton cloth was used as oviposition substrate. Ten pairs of moths were allowed and caged for four days. The number of eggs laid on treated and untreated ovipositional substrates were recorded.

The TNAU neem affected settling behaviour of *C. punctiferalis* larvae to the extent of 72.37 – 77.03 per cent and that of *Sciothrips cardamomi* Ramk. nymph to the extent of 80.07 – 85.12 per cent as against 87.24 – 92.84 and 92.93 – 92.84 per cent repulsion by the NeemAzal five per cent respectively. The order of repellency was NeemAzal (5%) ≥ NeemAzal (1%) > TNAU neem (0.03EC) ≥ Nimbecidine (0.15%) > Nimbecidine (0.03%) (Tables 1-2).

The oviposition of *C. punctiferalis* was reduced by neem formulations; the extent of reduction being 71.76 – 94.98 per cent. The order of ovipositional deterrence was NeemAzal

(5%) > NeemAzal (1%) ≥ TNAU neem ≥ Nimbecidine (0.15%) > Nimbecidine (0.03%) (Table 3).

**Table: 1. Effect of neem formulations on settling behaviour of *S. cardamom* - Multi & dual choice tests.**

Treatments	Multi choice		Dual choice-Treated		Dual choice -Untreated		Dual choice
	Number	Settling index	Number	Per cent	Number	Per cent	Settling index
1 Nimbecidine 0.03%	3.67 <sup>b</sup>	22.02	3.00	30.00 (33.21) <sup>f</sup>	7.00	70.00 (56.79) <sup>f</sup>	30.00
2 TNAU neem 0.03 EC	2.33 <sup>c</sup>	15.20	1.66	16.60 (24.03) <sup>d</sup>	8.33	83.33 (65.91) <sup>d</sup>	16.60
3 Nimbecidine 0.15%	4.33 <sup>b</sup>	24.99	2.33	23.3 (28.86) <sup>e</sup>	7.66	76.60 (61.08) <sup>e</sup>	23.00
4 NeemAzal 1%	1.33 <sup>de</sup>	9.28	1.33	13.30 (21.38) <sup>c</sup>	8.66	86.60 (68.54) <sup>c</sup>	13.30
5 NeemAzal 5%	1.00 <sup>e</sup>	7.14	0.66	6.60 (14.85) <sup>a</sup>	9.33	93.30 (75.04) <sup>a</sup>	6.60
6 Untreated check	15.67 <sup>a</sup>	-	-	-	-	-	-

Figures in the parantheses are arc sine ; where P is per cent of larvae settled

Means followed by same letter (s) in a column are not significantly different by DMRT (P=0.05)

**Table: 2. Effect of neem formulations on settling behaviour of *C. punctiferalis* – Multi and dual choice tests.**

Treatments	Multi choice		Dual choice- Treated		Dual choice -Untreated		Dual choice
	Number	Settling index	Number	Per cent	Number	Per cent	Settling index
1 Nimbecidine 0.03%	5.33c	24.29	5.83	29.32 (32.78)e	19.17	70.68 (13.06)a	23.32
2 TNAU neem 0.03 EC	4.33c	15.20	4.67	18.68 (25.59)c	20.33	81.32 (13.46)c	18.68
3 Nimbecidine 0.15%	4.67c	22.02	5.33	21.32 (27.49)d	19.67	78.68 (13.36)b	21.32
4 NeemAzal 1%	2.33c	9.28	2.67	10.68 (19.05)b	22.33	89.32 (13.75)d	10.68
5 NeemAzal 5%	2.00c	7.14	1.67	6.68 (14.93)a	23.33	93.32 (13.90)e	6.68
6 Untreated check	15.67c	-	-	-	-	-	-

Figures in the parantheses are arc sine  $\sqrt{P}$  ; where P is per cent of larvae settled  
Means followed by same letter (s) in a column are not significantly different by DMRT (P=0.05)

**Table: 3.Effect of neem formulations on oviposition of *C. punctiferalis* (dual choice test)**

Treatments		Multi choice		Dual choice -Treated		Dual choice- Untreated	
		Number of eggs	% over check	Number of eggs laid	Per cent	Number of eggs laid	Per cent
1	Nimbecidine 0.03%	45.33	14.11 (22.05)e	45.67	37.95 (38.02)e	120.33	62.05 (51.97)e
2	TNAU neem 0.03 EC	29.33	9.19 (17.62)c	27.00	21.25 (27.44)c	127.00	78.75 (62.56)c
3	Nimbecidine 0.15%	35.33	11.08 (19.42)d	42.33	29.88 (33.13)d	141.67	70.12 (56.87)d
4	NeemAzal 1%	21.70	6.80 (15.07)b	21.67	16.97 (24.31)b	127.67	16.97 (24.32)b
5	NeemAzal 5%	16.00	5.02 (12.88)a	17.33	14.17 (22.10)a	122.33	85.83 (67.90)a
6	Untreated check	319.00					

Figures in the parantheses are arc sine  $\sqrt{P}$  ; where P is per cent of egg laid  
Means followed by same letter (s) in a column are not significantly different by DMRT (P=0.05)