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Effect of three granular pesticides on damage by thrips (*Sciothrips cardamomi* R.) in small cardamom (*Elettaria cardamomum* Maton)

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ABSTRACT : Thrips (*Sciothrips cardamomi* R.), an important pest of small cardamom, causes about 30-80 per cent crop loss. Field evaluation of three granular pesticides, alone and in combination with *neem* oil cake, was done during 1989-93 to study their effects on various soil-borne pests of cardamom. Among the pesticides, phorate @ 5 and 2.5 g a.i./clump gave the highest reduction in thrips' damage (32.9 and 29.2%), followed by quinalphos (18.6 and 15.4%). In the case of carbofuran, significant difference was observed at 5 g a.i./clump only. *Neem* oil cake had no effect at all. The reduction in damage due to thrips is attributed to the protection of tender capsules by the pre-monsoon application of pesticides. Therefore, a single application of a broad spectrum pesticide like phorate is convenient and economical than the usual recommendation of six or seven rounds of insecticide spray.

Cardamom (*Elettaria cardamomum* Maton) is an important spice crop, earning valuable foreign exchange for the country. Among 56 species of insects and mites reported as pests of cardamom, the most destructive and persistent pest is cardamom thrips (*Sciothrips cardamomi* R.) These minute insects feed on the panicles, flower buds, ovary and tender capsules. The injured tissues form a corky layer on the capsule surface which appear as scabs. Such capsules appear malformed and shrivelled because of the poor seed development inside. Popularly known as 'cardamom itch', this has adverse effects on the visual appearance and even aroma of cardamom. The extent of damage in terms of quality and quantity ranges from 30 to 80 per cent (Anonymous, 1989; Kumaresan, Kegupathy and Baskaran, 1988).

Regular insecticide application (once in 30 days), especially during the summer and post-monsoon period is the only recommended method for the control of cardamom thrips (Anonymous, 1986; Anonymous, 1989). Field trials were undertaken during 1988-93 to study the effects of some granular pesticides and *neem* oil cake on various pests of cardamom. This contribution reports on the damage due to thrips assessed during 1992 and 1993.

Monoclonal suckers of a cardamom selection, P1 (Malabar type) were planted at a 2 m × 2 m spacing in approximately one hectare area, under natural forest shade at

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Cardamom Research Centre, Appangala, during September, 1988. Three granular pesticides, viz., carbofuran, phorate and quinalphos were tested at two dosage levels (2.5 and 5.0 g a.i./clump) alone and in combination with *neem* oil cake (250 and 500 g/clump). The application was done twice a year (April-May and September-October), in a circular band, 30-45 cm away from the base of the clump and covered with soil. The design was split plot with *neem* oil cake levels as the mainplot treatments and various pesticides as the sub plot treatments. There were four replications and the plot size was 12 plants with a single row of guard plants around the individual sub plots. Thrips' damage was assessed on cured cardamom capsules in three harvests, each of 1992 and 1993. The capsules with scabs for each plot were counted separately for each harvest and converted as percentage damage. The data were transformed using arc sine transformation and subjected to analysis of variance. The means were separated using Duncan's Multiple Range Test.

Table 1 shows the damage observed in different treatments at various harvest intervals during 1992 and 1993. *Neem* oil cake at both levels was found to have no effect at all on cardamom thrips. The level of control of thrips' damage was more in the early part of the harvest season, probably as a result of the pre-monsoon (April-May) application of pesticides. Incidentally, protection during this period enabled the tender capsules to develop without much damage. The increase in damage, observed as the post-monsoon season advances, is due to the high population build-up of thrips. All treatments except carbofuran 2.5 g a.i./clump, significantly reduced the damage due to thrips. However, the percentage reduction in damage over check in different treatments was 32.89, 29.18,

Table 1. Effect of three granular pesticides on damage to cardamom capsules by thrips

Treatment	Year	Capsule damage at various harvest intervals (%)			Mean	
		H1	H2	H3	1	2
Carbofuran	2.5 g	1992	39.26	46.46	54.58	46.74 b
		1993	39.14	53.94	42.32	
-do-	5.0 g	1992	34.13	46.49	55.12	45.23 b
		1993	36.59	48.78	35.53	
Phorate	2.5 g	1992	16.63	25.67	38.16	26.36 cd
		1993	22.40	23.58	15.93	
-do-	5.0 g	1992	12.23	18.68	31.32	20.20 d
		1993	15.22	24.37	15.86	
Quinalphos	2.5 g	1992	43.53	48.08	40.44	44.01 b
		1993	28.18	43.56	28.41	
-do-	5.0 g	1992	34.38	39.69	29.27	34.38 bc
		1993	29.14	40.84	39.08	
Check		1992	54.20	62.47	69.95	62.32 a
		1993	49.34	60.05	41.37	

Data are average of four replications summed across the mainplot treatments. In a column, means followed by a common letter are not significantly different at 5% level.

18.62, 15.40, 12.04 and 9.21 in phorate 5 and 2.5 g a.i./clump, respectively. With seven or six rounds of sprays, the reduction obtained in thrips' damage was 13-47 per cent (Naidu, 1990). Phorate at both levels gave excellent control of thrips in both the years. Earlier, phorate and carbofuran were also evaluated in which phorate gave comparable results with that of several liquid formulations of insecticides (Krishnamurthy *et al.*, 1989). It was reported to be effective in controlling plant parasitic nematodes and root grubs of cardamom (Anonymous, 1989; Varadarasan, 1992). Significant increase in yield and improvement in capsule size are also noticed in plants treated with phorate, as a result of its effects on a wide range of pests of cardamom (Anonymous, 1922). Considering the efforts and cost of inputs to take up five or seven rounds of insecticide sprays in a cardamom plantation, application of a broad spectrum pesticide like phorate is ideal and economical.

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