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EFFICACY OF CERTAIN SYSTEMIC NEMATICIDES AGAINST *MELOIDOGYNE INCOGNITA* IN A CARDAMOM NURSERY

by

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Heavy incidence of root-knot nematode *Meloidogyne incognita* (Kofoid *et* White) Chitw. was reported in a cardamom, *Elettaria cardamomum* Maton, nursey by Koshy *et al.* (1976). Heavily infested plants showed marginal necrosis and yellowing of leaves, reduced numbers of tillers, poor rhizome development and stunted growth. A trial was therefore undertaken using three systemic granular nematicides for the control of *M. incognita* infestations.

MATERIALS AND METHODS

The nursery was located on gently sloping land at the Cardamom Research Station, Pampadumpara, Idikki District, Kerala, where a heavy root-knot incidence had been recorded previously. The humus rich loamy black forest soil was worked to a depth of 30-45 cm to produce a fine tilth and raised beds 0.3 m high, 1.0 m wide and 6.0 m long were formed. Seedlings were raised in a primary nursery where root-knot nematodes were known to be abundant. The plants with four or five leaves were dug with soil and transplanted to the secondary nursery where the raised beds had been treated with the nematicides. Three nematicides were tested, each of the rates indicated in Table I, applied twice at the same rate in January and April, 1976. Each treatment was replicated three times. Each quantity of nema-

Table I - *Effect of three systemic nematicides against* M. incognita *in a cardamom nursery (Mean of 3 replications).*

Treatments	Rhizome weight	Root weight	Shoot weight	Root lenght	Shoot lenght	N. of tillers	Galls/root	N. of roots/plant	Per gram root population	Soil population
Fensulfothion 15 Kg/ha	115.3	114.7	454.0	34.3	122.0	11.3	5.3	46.0	942	2531
Fensulfothion 25 Kg/ha	127.0	141.3	507.7	35.3	128.0	11.3	1.0	55.7	718	873
Fensulfothion 50 Kg/ha	122.7	90.3	565.7	30.0	134.3	8.7	0.7	41.0	127	84
Aldicarb 2.5 Kg/ha	84.7	94.7	294.7	23.0	120.3	7.3	2.0	34.7	4313	1933
Aldicarb 5 Kg/ha	143.3	99.7	556.3	30.0	124.3	10.7	2.7	41.7	1729	1546
Aldicarb 10 Kg/ha	136.7	79.3	479.0	32.0	126.7	9.3	0.7	41.0	522	2104
Carbofuran 2 Kg/ha	96.0	95.7	409.3	32.0	121.3	9.3	15.0	34.7	2538	1282
Carbofuran 4 Kg/ha	122.3	84.0	434.7	31.0	127.0	9.0	3.3	37.3	1331	1612
Carbofuran 6 Kg/ha	122.7	96.7	430.0	37.0	153.0	10.3	2.7	49.3	1115	1544
Control	39.7	37.0	169.7	27.3	98.7	5.7	32.3	25.0	4040	2929
S.E.	33.24	28.53	126.85	9.22	19.32	1.46	3.08	8.34	812.2	919.7

ticide was mixed with one Kg of dry sand, broadcast uniformly to cover the entire area of the bed and worked into the soil with a small wooden peg immediately before transplanting in January, 1976. The nematicidal treatments were repeated in April. In July ten plants were carefully removed with intact root system from each plot. They were washed free of soil and shoot length, shoot weight, root length, root weight, number of roots, rhizome weight and number of pseudostems of each plant were recorded. A composite 250 g soil sample was taken from each plot to assess the nematode population. Root samples were cut into 2 cm pieces, mixed thoroughly and five pieces were picked randomly for each plant to count galls. Multiplication of the nematode was assessed from 5 g root samples which were stained in boiling acid fuchsin-lactophenol for three minutes, comminuted in a Waring Blendor for 40 seconds and three aliquots of 5 ml then examined for eggs, larvae and adults.

RESULTS AND DISCUSSION

Significant differences between treatments were observed with respect of fresh weight of rhizomes, roots, number of tillers and roots per plant (Table I). Maximum numbers of galls per root and nematodes per root weight and soil population were recorded from untreated controls. Fensulfothion at 50 Kg ai/ha and aldicarb at 10 Kg ai/ha provided the best control followed by fensulfothion at 25 Kg ai/ha. Nematicidal treatments with aldicarb at 2.5 Kg ai/ha and carbofuran at 2 Kg ai/ha were not significantly different from the controls in respect of nematode numbers in the roots or in the soil. Plant growth was slightly better in plots treated with fensulfothion at 50 Kg ai/ha, aldicarb at 10 Kg ai/ha and carbofuran at 6 Kg ai/ha, aldicarb at 10 Kg ai/ha and carbofuran at 6 Kg ai/ha but these treatments did not differ significantly in nematode control and plant growth from fensulfothion at 15 Kg ai/ha and 25 Kg ai/ha, aldicarb at 5 Kg ai/ha and carbofuran at 4 Kg ai/ha. Nematode free seedlings were not obtained from any of the treatments but the present results suggest that plant growth can be improved and root-knot nematode populations decreased considerably by applying fensulfothion at 15 Kg ai/ha, aldicarb at 5 Kg ai/ha or carbofuran at 4 Kg ai/ha at transplanting, followed by a second treatment at the same rates three months later.

LITERATURE CITED

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