Indian J. Nematol. 9 (1979): 15-19

CONTROL OF *RADOPHOLUS SIMILIS* (COBB, 1893) THORNE, 1949 IN COCONUT NURSERY

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To prevent the spread of *Radopholus similis* to uninfested areas through infested coconut seedlings, nursery beds at Central Plantation Crops Research Institute, Kasaragod were treated with fensulfothion @ 50 kg a. i./ha, carbofuran @ 6 kg a. i./ha and DBCP @ 60 l a. i./ha three times in a year. Though none of the treatments was effective in complete eradication of the nematode, fensulfothion reduced root population to the maximum extent followed by DBCP and carbofuran.

Koshy *et al.* (1978) recorded the widespread occurrence of *Radopholus similis* in south India and there does not appear any other record of this pest from other parts of the country. Koshy & Sosamma (1979) recorded heavy infestation of roots, both inside and outside the husk, of coconut seedlings released for planting from Central Plantation Crops Research Institute (CPCRI), Kasaragod and the Coconut Research Station, Nileswar. A trial was, therefore, laid out to prevent the spread of this nematode through infested coconut seedlings to other states by application of nematicides in the nursery.

MATERIALS AND METHODS

The experiment was done in an open pollinated Dwarf Orange coconut nursery in sandy loam soil on CPCRI Farm, Kasaragod during 1974 and 1975. Small plots with 40 seedlings each in an area of 6 m^2 were treated with fensulfothion[1] @ 50 kg a. i./ha, carbofuran[2] @ 6 kg a. i./ha, DBCP[3] @ 60 l a. i./ha and a check. The dosages used were on the basis of preliminary trials carried out during 1973-74 wherein three dosages of each chemical i.e. fensulfothion 50, 25 and 15 kg, carbofuran 6, 4 and 2 kg and DBCP 60, 45 and 30 l a.i/ha were tried.

[1] 0-diethyl-0-(4-methyl-sulphinyl-phenyl)-monothiophosphate.

[2] 2, 3-dihydro-2, 2-dimethyl-7 benzofuranyl methyl carbamate.

[3] 1, 2-dibromo-3-chloropropane.

Each treatment was replicated four times and the chemicals were applied thrice a year (September, December and March). Granulated formulations of fensulfothion and carbofuran, of the required quantities, were mixed with 1 kg sand and broadcasted uniformly in respective plots and were incorporated into the soil up to a depth of 7-10 cm by raking. DBCP was applied as soil drench, using a rosecan, after irrigating the plot to field capacity. The plots were irrigated twice a week and were kept free from weeds. Root samples were taken from two plants of each type from every replication for assessment of the nematode population before application of nematicides in December and March, but not in September due to lack of roots. This was done again in June when the seedlings were ready for release. Root samples were taken only once from the same plant and care was taken to avoid border plants from sampling.

The growth characters such as height, girth at collar and number of leaves of all the three types Dwarf x Tall (D x T), Dwarf Orange (DO) and segregants (Seg) were recorded in June on a set of eight plants representing each type in every replication.

Root samples (15 g) were cut into 3 cm long pieces and sliced longitudinally into 4 to 8 pieces, left submerged in water contained in a petri plate at 10-14°C (Koshy *et al.* 1975) for extraction of *R. similis* and per g population was calculated to find out the efficacy of nematicides.

RESULTS AND DISCUSSION

Analysis of data (Table 1) collected during December showed that September application caused a general reduction in root nematode populations but significantly only in fensulfothion treatment. During March countings, December application of carbofuran and DBCP resulted in reduction of nematode population whereas the population increased slightly in seedlings receiving fensulfothion and in control plots. Inspite of slight increase, the nematode population in fensulfothion treated seedlings was significantly less than that of control plants. Reduction of nematodes in DBCP treatment was also significant. Observations recorded in June, the time of seedling distribution, revealed that application of all the nematicides resulted in significant reduction in nematode population. The maximum reduction was obtained by fensulfothion followed by DBCP and carbofuran though the differences between fensulfothion and DBCP treatments were non-significant.

The growth characters were measured during June 1975 (Table II). The effect of nematicide treatment was found to be non-significant on the height of plants. Though the dwarf orange and segregant plants recorded slightly

higher values with carbofuran and DBCP, the D x T plants recorded reduction in height with all nematicides. Nematicides were found to significantly decrease the girth of D x T seedlings but had no effect on dwarf orange seedlings. The segregant plants treated with fensulfothion recorded significant increase in girth whereas carbofuran and DBCP treatment resulted only in slight increase. All nematicides were found to increase significantly the production of leaves of dwarf orange and segregant seedlings whereas carbofuran and DBCP significantly reduced the number of leaves on D x T seedlings and fensulfothion treated D x T plants were at par with control. Generally plants treated with fensulfothion recorded better growth of all the three types of plants. Carbofuran and DBCP showed no deleterious effect on growth of dwarf orange and segregant plants but inhibited growth of D x T plants. The need for screening more nematicides to attain complete elimination of *R. similis* from coconut seedlings is strongly indicated by these results.

Irrespective of the genotypes of the seedlings, all the plants treated with DBCP @ 60 l a.i./ha exhibited phytotoxic symptoms of the spindle leaf which exhibited a 7 to 10 cm wide yellow band across. Intensity of yellowing reduced with time and almost disappeared in 3 to 4 months.

TABLE I

Nematicidal action of test chemicals against R. similis *on coconut seedlings*

Treatment	Nematode population*/g of root (Av. of 4 replicates)		
	December	March	June
Fensulfothion	0.0442	0.0832	0.0289
Carbofuran	0.4176	0.3507	0.3625
DBCP	0.4983	0.1491	0.2433
Control	0.6309	0.7008	0.6567
Gen. Mean	0.3978	0.3209	0.3228
C. D. (P=0.05) for treatments	0.3141	0.3579	0.2199
C. D. (P=0.01) for treatments	0.4218	0.4806	0.2949

*Log transformed values.

TABLE II

Effect of nematicides on growth characters of coconut seedlings

Treatment	Height (cm)				Girth (cm)				No. of leaves			
	D x T	DO	Seg	Mean	D x T	DO	Seg	Mean	D x T	DO	Seg	Mean
Fensulfothion	160.82	95.15	119.73	123.23	14.28	10.50	13.78	12.85	9.72	9 03	9.58	9.44
Carbofuran	141.55	101.68	117.00	120.08	13.05	10.43	12.38	11.95	8.85	8.85	9.53	9.08
DBCP	137.23	94.58	117.25	116.35	13.23	10.50	12.82	12.22	8.93	9.03	9.98	9.31
Check	169.65	94.23	102.90	122.26	15.73	10.70	12.65	13.03	9.70	7.98	8.13	8.60
Mean	152.31	96.41	114.22	120.98	14·01	10.53	12.51	12.51	9.30	8.72	9.30	9.11
C. D. for treatments			N.S.				0.76				0.40	
C. D. at 0.5 for types			7.38				0.66				0.35	
C. D. at 0.5 for treatments x types			14.75				1.32				0.69	

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Accepted for publication : September 1979