

CONTROL OF *RADOPHOLUS SIMILIS* ON ARECANUT SEEDLINGS  
WITH ALDICARB, ALDICARB SULFONE, CARBOFURAN  
AND FENSULFOTHION

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**Abstract :** Efficacy of 4 systemic nematicides (aldicarb, aldicarb sulfone, carbofuran and fensulfothion @ 1 g a.i./ plant) applied 3 times in a year for 3 years, were tested against *Radopholus similis* on arecanut seedlings. All the chemicals were effective in reducing the numbers of *R. similis* significantly and increasing plant growth in comparison to control plants. Aldicarb and fensulfothion were most effective while aldicarb sulfone and carbofuran were less effective in controlling nematodes. None of the chemicals was phytotoxic on arecanut seedlings.

**Key words :** *Radopholus similis*, arecanut seedlings, control, aldicarb sulfone, carbofuran, aldicarb and fensulfothion

The burrowing nematode, *Radopholus similis* (Cobb, 1893) Thorne, 1949, was reported from the root zone of arecanut (*Areca catechu* L.) by Kumar *et al.* (1971). Later, Koshy *et al.* (1978) reported lesions and rotting of arecanut roots and also widespread occurrence of the nematode on arecanut in South India. Subsequently, Koshy & Sundararaju (1983) established its pathogenicity on arecanut. A study was, therefore, initiated to evaluate 4 systemic nematicides for its control.

MATERIALS AND METHODS

Twenty-five cement pots (75 cm) were buried in soil, leaving the top 15 cm above the soil surface, at 90 cm distance, in a field at CPCRI Research Centre, Palode (Kerala). Pots were filled with infested (4 nematodes/100 g soil) laterite soil (80 kg/pot) collected from the farm. One year old arecanut

seedlings (cultivar, South Kanara) raised in sterile soil, were planted in September, 1977. *Pueraria phaseoloides* was grown in the interspace as a cover crop. During summer, shade and water was given. The treatments were, aldicarb (Temik 10-G), aldicarb sulfone (Sulfo-carb 75% WP), carbofuran (Furadan 3-G), fensulfothion (Dasanit 5-G) and untreated control, replicated 5 times. The chemicals were applied 3 times in a year (September, January and May) @ 1 g a.i./ seedling and the first application was done immediately after planting.

After 3 years (October, 1980), plants, with entire root system, were removed from the pots and growth characters were recorded, alongwith visual observations of lesions and rotting of roots on a 6 point scale (Koshy & Sundararaju, 1983). After indexing, roots were cut into small pieces, mixed thoroughly and 3 aliquots, 10 g each, were collected from each seedling, stained in boiling acid

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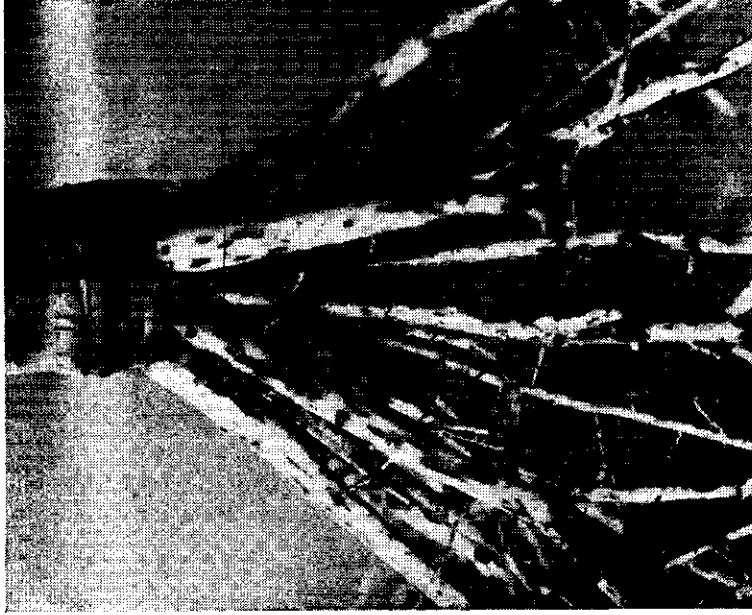


Fig. 2. *Radopholus similis* infested arecanut seedling showing lesions, rotting and blackening of root tips (control plant).



Fig. 1. Effect of various nematicides on the growth of arecanut seedlings in comparison to the untreated control.

- A—Control
- B—Carbofuran
- C—Fensulfothion
- D—Aldicarb sulfone
- E—Aldicarb

fuchsin-lactophenol for 3 minutes, cleared and macerated for 40 seconds using a Waring blender for population counts. The total root population was computed with an average per ml population. Nematodes from 250 g soil, from each pot, were extracted by Cobb's sieving method for estimating total soil population.

#### RESULTS AND DISCUSSION

All the chemicals reduced the nematode population significantly and increased growth of arecanut seedlings in comparison to the control plants (Fig. 1). No evidence of phytotoxicity was observed with any of the tested nematicides. Increase in plant growth with regard to

shoot length and weight, root length and weight and collar girth were 46, 168, 33, 173 and 41 per cent respectively over control plants with fensulfothion treatment. Lesions, rotting and blackening of root tips could not be observed on the root system of any of the seedlings treated with fensulfothion and aldicarb. Plants treated with carbofuran and aldicarb sulfone were also relatively free from root lesions when compared to those grown in untreated soil (Fig. 2) which had recorded the highest root lesion index of 4.9 (Table 1).

Fensulfothion and aldicarb gave absolute control of *R. similis* both in soil and roots compared to aldicarb sulfone and carbofuran. Similar results

TABLE I : Effect of various nematicides on shoot and root of arecanut seedlings and *Radopholus similis* population (Mean of 5 replications)

S. No.	Treatments	Shoot		Girth at collar region (cm)	Root		Root lesion index	Total nematode population (soil+root)
		Length (cm)	Weight (g)		Length (cm)	Weight (g)		
1.	Control	185.0	1752 <sup>e</sup>	24.4 <sup>b</sup>	63.0	602.0 <sup>b</sup>	4.9 *2.2 <sup>b</sup>	93,488
2.	Carbofuran	230.4 (24.5)	4018 <sup>b</sup> (129.3)	30.8 <sup>a</sup> (26.2)	79.0 (25.4)	1270.0 <sup>a</sup> (110.9)	1.4 *1.2 <sup>a</sup>	4,018
3.	Aldicarb	247.8 (33.9)	4150 <sup>b</sup> (136.8)	32.4 <sup>a</sup> (32.8)	83.0 (31.8)	1468.0 <sup>a</sup> (143.8)	1.0 *1.0 <sup>a</sup>	0
4.	Aldicarb sulfone	257.0 (39.0)	4200 <sup>b</sup> (139.7)	33.6 <sup>a</sup> (37.7)	75.4 (19.7)	1500.0 <sup>a</sup> (149.2)	1.2 *1.1 <sup>a</sup>	1,412
5.	Fensulfothion	269.2 (45.5)	4700 <sup>a</sup> (168.3)	34.4 <sup>a</sup> (41.0)	84.0 (33.3)	1644.0 <sup>a</sup> (173.1)	1.0 *1.0 <sup>a</sup>	0
S. Em.		20.21	663.52	1.88	10.95	221.71	0.08	
C. D. at 1%			—	7.59				
C. D. at 5%		NS	1957	—	NS	654	0.24	

Means with notations by the same letter do not differ at 5% level.

Figures in parentheses are per cent increase over control

\*Transformed values.

were reported by Koshy & Nair (1979) on coconut seedlings.

The present result is also in agreement with that of Broadley (1979), who reported that fensulfothion @ 2 g a.i./stool applied to banana 3 times in a year continuously for 4 years gave maximum control of *R. similis* compared to phenamiphos, ethoprophos and oxamyl.

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