

STUDIES ON THE CHEMICAL CONTROL OF BANANA NEMATODES

K. K. R. NAIR

College of Agriculture, Vellayani, Kerala

The plant parasitic nematodes have now assumed importance as a pest of banana in Kerala, India. The nematodes feed by puncturing individual root cell with its stylet, injecting a digestive secretion from its oesophageal glands and sucking out the liquified cell contents. The first visible symptom of the attack is a small dark spot on the root. At the later stages the lesions enlarge and spread through the cortex. As a result of the attack of nematode the number of fruits in the bunch is reduced and individual fruits are often small. Affected plants do not show full response to fertilizers irrigation and other cultural practices. Nair *et al.* (1966) have recorded the presence of plant parasitic nematodes in banana plants and soils of Kerala. The present studies were undertaken to evaluate the efficiency of different nematicides for the control of banana nematodes.

Materials and Methods

The efficiency of different nematicides were evaluated by laying out a field experiment. The experiment was laid out during October 1976 at the Banana Research Station, Kannara, Trichur. The experiment was laid out in R. B. D. with 4 replications and 7 treatments. The variety used for the trial was Nendran. Uniform suckers were selected from the Research Station. Care was taken to see that the nematode free suckers alone were selected. All the roots were removed and "paring" was also done before planting. The treatments were as detailed in Table 1.

Before planting soil samples were taken from each treatment to assess the population of nematodes. First application of nematicides was done at the time of planting in the pit around the suckers. The application was repeated 4 months after planting. Before second application soil and root samples were collected and the nematode population was assessed by the method Christie and Perry, 1951. Finally soil and root samples were collected for the assessment of nematode population, four months after the second application. The efficiency of different nematicides was evaluated by the population of nematodes and bunch weight in various treatments.

Results and Discussion

Observation on the mean population of nematodes in 10 grams of root samples and 200 ml of soil samples collected at different stages are presented in Tables 1 and 2. From the counts of the nematode population in the

root samples of various treatments, it is seen that there is reduction in the number of parasites as a result of application of nematicides. The statistical analysis of the mean population of nematodes showed that there was significant difference between the population in treated plots and control plots.

Table 1 Mean population of nematodes in 10 grams of root samples collected at different stages.

Treatments	Active ingredient per plant (in g)	Period/ months after planting	<i>fiodopho/us similis</i>	<i>Praty-lenchus</i> sp.	<i>Helicoty lenchus</i>	Total
Fensulfothion (Dasanit)	2	4	25	8	...	33
		8	20	4	...	24
Aldicarb (Temik)	2	4	28	7	2	33
		8	25	3	...	33
Carbofuran (Furadan-3)	2	4	30	10	5	45
		8	28	5	8	41
Phorate (Thimet)	2	4	26	8	7	41
		8	21	9	2	32
Neemcake	400	4	40	21	8	69
		8	35	22	4	51
Phenamiphos (Nemacur)	2	4	18	6	3	27
		8	15	8	4	27
Control		4	78	24	9	111
		8	97	32	17	146

Guerout (1972) found that the normal pathogenic level is 100 numbers of nematodes (*ft. similis*) in 10 grams of roots. In this trial the population of (*R. similis*) did not exceed the pathogenic level in untreated plots. The population of soil nematodes also showed the same trend as in root samples.

Table 3 shows the mean weight of bunches in each treatment. The yield data shows that the treated plots were significantly superior to untreated plots. Maximum bunch weight was obtained in the plots treated with Nemacur followed by Temik and Dasanit. This result is in agreement with the findings of Vilardebo (1971) and Raman *et al.* (1976). The result of this study indicate that the loss in yield due to nematode attack can be reduced considerably by the application of nematicides especially Nemacur.

Table 2 Mean population of nematodes in 200 cc soil collected from the experiment at different stages.

Treatment	Period (months after planting)	<i>fiac/o-pholus</i> sp.	<i>Pratylenchus</i> sp.	<i>Helicotylenchus</i> sp.	Others	Total
Dasanit	Before planting	59.5	69.7	13.5	19.2	162.0
	4	32.0	24.0	4.0	8.0	76.0
	8	28.0	20.0	8.0	3.0	59.0
Temik	Before planting	59.7	53.5	14.7	19.7	167.7
	4	31.0	21.0	8.0	9.0	69.0
	8	25.0	18.0	8.0	7.0	58.0
Furadan	Before planting	60.5	65.5	19.5	20.2	165.5
	4	35.0	28.0	9.0	8.0	80.0
	8	30.0	23.0	7.0	5.0	65.0
Thimet	Before planting	63.2	66.0	20.0	14.7	164.0
	4	31.0	23.0	6.0	11.0	76.0
	8	30.0	22.0	10.0	16.0	78.0
Neem cake	Before planting	57.7	69.2	21.0	14.5	162.5
	4	40.0	39.0	10.0	8.0	97.0
	8	48.0	37.0	12.0	4.0	101.0
Nemacur	Before planting	63.5	66.0	16.5	16.7	164.5
	4	29.0	18.0	5.0	7.0	57.0
	8	21.0	12.0	6.0	5.0	44.0
Control	Before planting	69.2	62.7	17.7	19.0	158.7
	4	49.0	38.0	32.0	41.0	160.0
	8	70.0	69.0	40.0	27.0	206.0

Table 3 Mean weight of bunches in each treatment in kgs.

Treatment	R ₁	R ₂	R ₃	R ₄	Total	Mean
Dasanit	9.1	10.7	11.0	10.4	41.2	10.3
Temik	10.7	11.1	9.8	12.4	44.0	11.0
Furadan	9.5	10.3	8.7	11.4	39.9	9.9
Thimet	9.6	10.3	11.5	11.5	43.5	10.0
Neem cake	7.2	9.5	9.0	10.9	36.6	9.2
Nemacur	11.1	10.3	12.0	11.9	45.3	13.3
Control	8.9	7.7	10.4	7.9	34.7	8.8

C.D. at 0.05—1.96

സംഗ്രഹം

വാഴയെ ആക്രമിക്കുന്ന വേരുത്തൂപ്പൻ നിമരോഡിനെ നിയന്ത്രിക്കുന്നതിലേയ്ക്ക് വിവിധ വിരനാശിനികൾ ഉപയോഗിച്ച് കണ്ണാറവാഴ ഗവേഷണ കേന്ദ്രത്തിൽ ഒരു പരീക്ഷണം നടത്തുകയുണ്ടായി. ഫെൻ സൾഫോതൈയോൺ, ആൽഡികാർബ്ബ്, കാർബോഫ്യൂറാൻ, ഫോറോൻ ഫീനാമിഫോസ്, വേപ്പിൻപിണ്ണാക്കു, എന്നിവയാണ് പരീക്ഷിച്ചു നോക്കിയത്. ഫീനാമിഫോസ് (നെമാക്ടർ) ഉപയോഗിച്ചു വാഴയുടെ നിമരോഡിന്റെ എണ്ണം കുറവായും, കലയുടെ വലുപ്പം കൂടുതലായും കാണുകയുണ്ടായി. ഒരു വാഴയ്ക്ക് 4 ഗ്രാം ഫീനാമിഫോസ് (സജീവാംശം), rasn| തവണയായി, ഒരു നട്ടെൻ അവസരത്തിലും, മറ്റേതു് rosng മാസം കഴിഞ്ഞു, നൽകിയാണ് പരീക്ഷണം നടത്തിയത്.

REFERENCES

Nair, M. R. G. K., Das, N. M. and Menon, M. R. 1966, *Indian J. Ent.* **28**, 553—554.
 Guerout, R. 1972. Relationship between population of *Radopholus similis* and banana growth, *Fruits* **27**, 331—337.
 Vilardibo, A. 1971. Control of nematode on banana in West Africa with Nematicur. *Bayer* **24**, 155—169.
 Roman, J., Rivas, X., Rodriguez, and Oramas, D, 1976. chemical Control of nematodes in plantain *Journal of of the Agriculture University of Puerto Rico.* **60**, 36—44.

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