

NOTE BREVI - SHORT COMMUNICATIONS

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EFFICACY OF THE ANTIHELMINTHIC ANTIBIOTIC (KT-199)
FOR THE CONTROL OF ROOT-KNOT NEMATODE
MELOIDOGYNE JAVANICA ON TOBACCO

by

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Studies on the effect of antibiotics on plant parasitic nematodes generally have been limited (Estey and Panayi, 1972; Setty *et al.*, 1978). Reddy (1978) reported that antiameobin' when applied as a soil drench or as a foliar spray to tomato plants did not affect the growth of the plants but significantly reduced the development and reproduction of *Meloidogyne incognita*. Nanje Gowda (1983) reported a similar effect with the antibiotic (KT-199). Investigations on the effect of the antibiotic on the growth of tobacco and development and reproduction of *Meloidogyne javanica* (Treub) Chitw. were undertaken in pot culture.

Six weeks old seedlings of tobacco (cv. VFC special) raised in sterilized soil in seed pans were transplanted to 15 cm diameter clay pots filled with sterilized soil. Two weeks after planting, 10 ml of a suspension containing about 1000 second stage larvae of *M. javanica* were introduced into four holes made in the soil around the base of each of the plants.

Antibiotic (KT-199) is a semisynthetic peptide antihelminthic antibiotic produced in the submerged cultures of *Streptomyces* sp. Two days after nematode inoculation, 10 ml of different dilutions in water of the antibiotic, viz. 125, 250, 500 and 1000 ppm or of the nematicide phenamiphos (500 ppm a.i.) were applied either as a soil drench or as a foliar spray. Controls consisted of a series of pots without nematodes and drenched or sprayed with a water solution of 500 ppm of KT-199, of a series of pots inoculated with nematodes

but drenched or sprayed only with 10 ml each of distilled water or a series of pots uninoculated nor treated. The soil drench was applied by pipetting the solution around the roots and foliar sprays were applied with an atomizer, care being taken to avoid spray coming into contact with the soil by covering the base of the plant with a plastic sheet. The plants were kept in a glass house at 25 to 30 °C.

Fortyfive days after nematode inoculation, the experiment was terminated and measurements taken of plant growth with respect to shoot height and fresh weights of shoots and roots and the number of galls, and egg masses per plant and eggs per egg mass were counted as an assessment of the efficacy of the antibiotic on nematode development.

The results show that the antibiotic and phenamiphos, when applied as a soil drench or as a foliar spray, had no adverse effects on the growth of the tobacco plants (Table I) except for leaf scorching when the highest concentration of the antibiotic (1000 ppm) was applied as a foliar spray. The antibiotic as a soil drench significantly increased the root weight of tobacco plants. The antibiotic and the

Table I - *Effect of an antibiotic and phenamiphos as soil drench and as foliar spray on the growth of tobacco plants infested with M. javanica.*

Treatment	Concentrations (ppm)	As soil drench			As foliar spray		
		Shoot height (cm)	Shoot weight (g)	Root weight (g)	Shoot height (cm)	Shoot weight (g)	Root weight (g)
Antibiotic + nematodes	125	35	53	12	36	63	11
	250	42	74	16	44	66	13
	500	42	70	17	36	54	11
	1000	42	65	18	41	49	9
Phenamiphos + nematodes	500	44	50	8	37	58	14
Antibiotic only	500	31	42	8	40	68	12
Nematodes only	—	33	48	9	37	59	14
Control	—	39	55	9	37	60	13
Mean	—	37	57	12	38	60	12
S. Em. ±	—	4.0	7.1	1.4	4.6	6.4	1.5
C. D. Value at 1%	—	NS	NS	5.8	NS	NS	NS

NS = Not significant.

nematicide significantly inhibited development and reproduction of *M. javanica* in terms of number of galls, egg mass and egg production when compared with control plants (Table II). When comparing soil drench and foliar spray, the foliar spray of either treatment was slightly better in decreasing galling and production of egg mass and eggs. But phenamiphos was slightly better in controlling the nematode when applied as a soil drench compared to the foliar spray. Reddy (1978) reported that foliar spray and soil drench applications of anti amoebin, one week prior to larval inoculation had no deleterious effects on the growth of tomato, but nematode development was inhibited more with foliar sprays than with soil drenches.

Table II - Effect of an antibiotic and phenamiphos as soil drench and foliar spray on the development of *M. javanica* on tobacco plants.

Treatment	Concentrations (ppm)	As soil drench			As foliar spray		
		No. of galls/plant	No. of egg masses/plant	No. of eggs/egg mass	No. of galls/plant	No. of egg masses/plant	No. of eggs/egg mass
Antibiotics + nematodes	125	205	143	409	144	117	371
	250	162	128	375	124	105	309
	500	135	106	305	90	57	275
	1000	109	73	278	84	56	258
Phenamiphos + nematodes	500	92	60	401	118	85	435
Nematodes only	—	262	174	705	230	175	730
Mean	—	161	114	412	132	99	396
S. Em. \pm	—	6.4	6.1	30.7	9.0	7.7	21.4
C. D. value at 1%	—	26.0	24.9	124.9	36.6	31.3	87.1

Finally, as the concentrations of the antibiotic increased, there was a proportionate decrease in the fecundity of *M. javanica* in both soil drench and foliar spray applications, and the antibiotic at higher concentrations, was more effective than phenamiphos in reducing the fecundity of the nematode.

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