Nematol. medit. (1980), *8*: 107-110.

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EFFECT OF SOME ORGANIC MATERIALS ON ROOT-KNOT NEMATODES ON TOMATOES IN FIELD PRELIMINARY EXPERIMENTS

by

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The effect of organic materials applied to soil in attempts to control plant-parasitic nematodes and increase yields has been examined in many experiments. The suppression or reduction of noxious nematodes could be due to many factors none of which has been identified specifically (Marshall, 1977). Experiments were done mainly in pots and rarely in the field. Often excessive rates of amendments were applied and then nutrient content ignored.

This paper reports the effect of five commercial organic materials on *Meloidogyne incognita* (Kofoid *et* White) Chitwood attacking on tomatoes in the field.

MATERIALS AND METHODS

Tomatoes were grown for many successive years at the trial site and a severe infestation by root-knot nematodes was noted in 1977. The following organic materials were applied: dried poultry faeces (DPF), dried poultry manure (DPM), composted oil cake (COC), composted municipal refuse (CMR) and partially composted poultry manure (CPM). These were applied at 35 and 70 q/ha dry weight, a week before transplanting tomato cv S. Marzano (April 27, 1978).

The inorganic chemical composition of the organic materials used in the experiment is reported in Table I. The field plots were 6 m x 7 m and each treatment was replicated four times in a random-

Table I - *Chemical composition of organic materials.*

Amendments	pH	Dry matter	Composition %							
			N	P_2O_5	K_2O	Fe	Mn	Cu	Zn	Mo
DPF	7.4	90.4	3.8	4.6	2.58	0.21	0.035	0.0027	0.024	< 0.001
DPM	7.2	73.1	2.4	3.3	2.51	0.07	0.028	0.0023	0.024	< 0.014
COC	7.9	81.9	0.7	0.1	0.42	0.17	0.049	0.0011	0.0014	< 0.001
CMR	7.0	79.2	0.7	0.8	0.24	6.09	0.075	0.13	0.29	0.0018
CPM	7.7	83.1	2.3	2.2	1.32	3.1	0.06	0.07	0.16	< 0.001

ized complete block design. Six months after transplanting, root-knot severity was determined on 10 tomato-plants chosen at random and scored on a scale of 0, no galls on roots, to 7, all roots severely galled. The scores were used to calculate a mean root-knot index by adding all the scores and dividing by the number of plants in the sample.

Free-living nematodes and other invertebrate animals were extracted by the flotation sugar method and counted from 200 ml soil from each plot.

The mean root-knot indices were analized statistically and compared by Duncan's multiple range test.

RESULTS AND DISCUSSION

All the organic materials applied significantly reduced the root-knot indices compared with the untreated control (Table II). The largest decrease in the root-knot index was obtained from undecom-

Table II - *Effect of organic materials on* Meloidogyne incognita *and other invertebrates.*

Amendments	Rate of application q/ha	Mean root-knot index*	Number of soil animals extracted							Final pH of soil
			Nematodes			Enchytraeids	Mites	Insect		
			plant-parasitic		non plant-parasitic			Collembolans	Larvae	
			Meloidogyne iv	others						
DPF	70	3.2 A a	145	20	191	9.5	26.3	19.3	6	7.7
CPM	70	3.7 AB ab	190	46	155	6	4.3	5.7	1	7.6
CPM	35	3.8 AB abc	229	28	170	4	12.5	4.5	5.5	7.4
DPM	70	4.0 ABC bcd	234	26	176	10	17.5	6	5	7.6
COC	70	4.0 ABC bcd	203	31	177	7.7	24.2	4.2	17.5	7.7
DPF	35	4.2 BC bcde	157	27	179	9.5	27.5	4.2	5	7.6
DPM	35	4.2 BC bcde	171	13	157	7.7	18.3	12.5	6	7.6
CMR	70	4.3 BC bcde	230	20	158	12.2	21.2	6.7	9.7	7.6
COC	35	4.4 BC cdeg	191	26	200	4	24.7	7.5	8.7	7.6
CMR	35	4.8 C eg	330	33	287	6	25	3	3.7	7.6
Control	—	5.8 D h	365	5.5	157	4.2	2	2	0.5	7.5

(1) Means followed by the same letter are not significantly different at P = 0.01 (capital letters) and P = 0.05 (small letters) by Duncan's multiple range test.

posted or partially decomposted organic matter rather than from raw materials.

Application of the materials at fertilizer rater (35 q/ha) was unsatisfactory; doubled rates were better but less effective than expected from nematicide treatment.

Data of animals extracted from the soil show a decrease of *M. incognita* larvae and an increase of non-parasitic and other plant-parasitic nematodes. Enchytraeids, mites, collembolans and insect larvae increased slightly. Preadacious nematodes were not seen.

The nematicidal effect of organic soil amendments requires further investigation, particularly to examine the environmental factors involved in the reduction of plant-parasitic nematodes and their influence on the effectiveness of soil fumigants or other nematicides.

At a low initial nematode densities the application of organic material may be sufficient to keep some nematode populations below the economic threshold.

LITERATURE CITED

MARSHALL V. G., 1977 - Effects of manures and fertilizers on soil fauna: a review. C.A.B., Commonwealth Bureau of Soils, Special Publ. No. 3, pp. 79.

Accepted for publication on 10 January 1980.