CONTROL OF THE ROOT-KNOT NEMATODE *MELOIDOGYNE INCOGNITA* BY IVOMEC CONTAINING AN EXAMETABOLITE OF *STREPTOMYCES AVERMITILIS*

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To find new control methods involving a reduction of applied synthetic molecules and a greater use of natural means of struggle, which could be applied to an organic and sustainable agriculture, recognized by the Europe Community since 1991 (EC Regulation 2092), the use of a veterinary antihelmintic product (IVOMEC), based on exametabolites produced by *Streptomyces avermitilis*, was tested in a pot experiment against the root-knot nematode *Meloidogyne incognita*. Tomato seedlings (cv. Rutgers) were transplanted in clay pots (V=1,000 ml) filled with a *M. incognita* infested soil (15 eggs and juveniles/mL soil). Pots were treated at transplant with 250 mL of different concentrations of aqueous solutions of IVOMEC (0.0625, 0.125, 0.25, 0.5, 1, 2 and 4 ml/l) and arranged on benches in a glasshouse at 25±2 °C in a randomized block design with six replicates/treatment. Nematode-infested untreated soil (Control) and fenamiphos (Fen) treated soil were used as controls. During the experiment plants received all the necessary maintenance (irrigation, fertilization, etc.). Two months later, at the end of the experiment, plants were uprooted to estimate root gall index (RGI) according to a 0-10 scale (0 = no galls and 10 = root system completely deformed by the presence of large and numerous galls), eggs and juveniles/g root (Hussey and Barker's method), soil nematode population density (Coolen's method), total nematode population density and the nematode reproduction factor *r* expressed as ratio between final and initial population density (*Pf*/*Pi*) (Table 1). Data from the experiment were subjected to analysis of variance and means compared by Least Significant Difference's Test. All statistical analysis were performed using Plot IT program. Lethal doses of ivermectin (as Ivomec formulation) were also calculated from pot experiment data to obtain different mortalities of the nematode (Table 2). Results clearly demonstrate the efficacy of ivermectin, applied at transplant at different rates (1, 2 and 4 ml/l), to decrease RGI, eggs and juveniles/g root and ml soil, total nematode population density and the reproduction factor, in comparison to the untreated control plants.

Table 1

Effect of different doses of ivermectin as ivomec formulation on *Meloidogyne incognita* infecting tomato plants (cv. Rutgers)

Treat.	Dose c.p. (mL/L)	RGI (0-10)		Eggs and J_2/g root (x 100)		Eggs and J_2/ mL soil		Total nemat. pop./pot (eggs and J_2) (x1,000)		*Pf/Pi*	
Control	---	7.0[1]	A[2]	67.5	A	149	A	1,106	ABC	74	ABC
Fen	43 L/ha	4.3	CDE	68.5	A	127	AB	1,531	A	102	A
Ivomec	0.0625	5.8	AB	45.7	ABC	129	AB	843	BCD	56	BCD
Ivomec	0.125	5.5	BC	56.5	AB	113	ABC	1,237	AB	82	AB
Ivomec	0.25	5.2	BCD	46.8	ABC	78	ABCD	856	BCD	57	BCD
Ivomec	0.50	3.8	DE	35.5	BC	40	BCD	712	CD	47	CD
Ivomec	1.0	3.3	EF	31.5	C	23	CD	434	DE	29	DE
Ivomec	2.0	2.2	FG	4.0	D	12	D	65	E	4	E
Ivomec	4.0	1.3	G	2.5	D	2	D	22	E	1	E

[1]Each value is an average of six replications;

[2]Data flanked in each column by the same letters are not statistically different according to Least Significant Difference's Test (P=0.01).

Table 2.

Lethal doses of ivermectin (a.i.) as ivomec formulation (c.p.) on the root-knot nematode *Meloidogyne incognita* assessed in a pot experiment

Per cent mortality	Lethal doses ivermectin (µg/L soil)
50	LD_{50} = 667
60	LD_{60} =934
70	LD_{70} =1,342
80	LD_{80} = 2,065
90	LD_{90} = 3,732
99.9	$LD_{99.9}$ = 15,317

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