

RESUMEN

En un experimento de campo se compararon los nematicidas de D-D, Vorlex, Bunema, Oxamyl, Phenamiphos y DBCP para el control de nemátodos parasíticos y la producción de tomate. El examen de muestras de suelo de cada parcela del terreno experimental después de 2 meses demostró que los tratamientos redujeron significativamente las poblaciones de *Pratylenchus zae*, *Helicotylenchus dihystra*, *Rotylenchulus reniformis*, *Tylenchorhynchus* sp., *Criconemoides* sp. y *Meloidogyne incognita*. El uso de una cobertura de plástico negra para proteger las plantas no mejoró el control de los nematodos en los tratamientos pero dió buen control de las malezas. Los tratamientos con y sin cobertura no aumentaron la producción de tomate y dieron una interacción insignificante entre los nematicidas y el plástico. No se registró acción fitotóxica en ninguno de los tratamientos.

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CONTROL OF *PRATYLENCHUS BRACHYURUS* IN ROUGH LEMON SEEDLINGS WITH DOWCO 275 (DIETHYL-FLUORO-PYRIDYL-PHOSPHOROTHIOATE)^{1/} [CONTROL DE *PRATYLENCHUS BRACHYURUS* EN LIMON RUGACEO CON DOWCO 275 (DIETIL-FLUORO-PIRIDIL-FOSFOROTIOATO)]. J. J. Frederick and A. C. Tarjan, Institute of Food and Agricultural Sciences, University of Florida, Agricultural Research and Education Center, Lake Alfred, Florida 33850, U.S.A.

ABSTRACT

Soil amendment with Dowco 275 (0-0 diethyl 0-(6-fluoro-2 pyridyl) phosphorothioate) granules at rates of 5.6 to 22.4 kg/ha (a.i.) around 2-yr-old potted rough lemon (*Citrus jambhiri* Lush.) seedlings in the greenhouse gave significant control of *Pratylenchus brachyurus* and increased top growth of the plants. Beneficial effects of treatment occurred at all but the lowest rates used. The 5.6 and 11.2 kg/ha rates resulted in 19 to 27% and 43 to 54% increase in height and weight

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of aerial (aboveground) parts respectively, and a 46 to 86% decrease in nematode population as compared to controls. Application of higher rates of the chemical resulted in negligible additional benefits.

INTRODUCTION

Experimentation with methods of applying chemicals to plants is revealing an increased effectiveness of organic phosphates as nematicides. The use of several of these chemicals as crop protectants in the past has not been encouraged, partly due to their relatively high mammalian toxicity. However, use of such materials has resulted in favorable responses in plant growth and significant decreases in soil and root nematode populations.

The search for effective organo-phosphates with relatively low mammalian toxicity has progressed with the introduction of several materials which are still in the experimental stages of development. Dowco 275 (0-0 diethyl 0-(6-fluoro-2-pyridyl) phosphorothioate) was initially, but erroneously, referred to as "... much less toxic to mammals than aldicarb and other carbamoyl oxime nematicides" (3). The material has a higher mammalian toxicity (oral $LD_{50} = 12.44$ mg/kg) than originally reported, nonetheless, it is less toxic than oxamyl (oral $LD_{50} = 5.4$ mg/kg) or aldicarb ($LD_{50} = 0.9$ mg/kg). Preliminary reports (1,3) on the nematocidal properties of Dowco 275 dealt only with applications of the chemical to potato plants infected with sedentary root nematodes. The objective of the present research was to evaluate the efficacy of the material applied to perennial plants infected with migratory nematode parasites.

MATERIALS AND METHODS

Thirty 2-yr-old rough lemon (*Citrus jambhiri* Lush.) seedlings infected with *Pratylenchus brachyurus* (Godfrey, 1929) and growing in Astatula fine sand in 6-in plastic pots were separated into 5 groups of 6 plants each. Dowco 275 granules (10% a.i.) were applied at rates of 1.1, 5.6, 11.2, and 22.4 kg/ha (1.0, 5.0, 10.0 and 20.0 lb/A) a.i. and incorporated into the upper 1/2 in of soil with a spatula. This same soil volume in the control pots was similarly disturbed. The plants were maintained in a thermostatically controlled greenhouse and irrigated with tap water.

Three mos after initiation of the experiment, the plants were cut back to approximately 12 in in height, and weight and length of cuttings were recorded. After 6 mos, total aboveground height and weight and moist root weight of plants were combined with the previous measurements. At that time, nematodes were extracted by incubation of 5-g root samples in polyethylene bags (2) for 5 days at 21C. All data were subjected to analysis of variance.

RESULTS

Increased dosage generally resulted in increased effectiveness (Table 1). An abatement in efficacy occurred at the 11.2 kg/ha rate with a decrease in mean top (aerial part) weight and length of test plants in comparison to the 5.6 kg/ha rate. However, the 11.2 kg/ha rate resulted in best nematode control, with an 86% decrease in population as compared to controls.

Significant improvement of aboveground plant growth occurred at the 5.6 kg/ha rate with a 27% increase in top length and a 54% increase in top weight as compared to controls. There was also good nematode control at this rate with a 46% decrease in population. The overall maximum effectiveness of the chemical occurred with the 5.6 and 22.4 kg/ha rates (Table 1).

There was no significant difference in root weights between treatments.

DISCUSSION

The general similarity of results between the 5.6 and 22.4 kg/ha rates indicated a maximum effectiveness of the nematicide tested. Significant nematode control and improved plant growth was achieved at the 5.6 kg/ha rate with no consistently significant increase in effectiveness between that rate and higher rates.

Whitehead and Ahmed (3) recorded a similar leveling off of the efficacy of Dowco 275 on potato cyst nematode populations in the soil. They found no significant difference in nematode control between the 5.6 and 22.4 kg/ha rates. In another test, they detected no significant differences in weights of potato tubers from pots that had been treated with Dowco 275 at rates of 2.8 to 11.2 kg/ha (3).

Boparai and Hague (1) found the chemical more effective than aldicarb or thioxamyl (oxamyl) for control of *Heterodera* sp. and *Meloidogyne* sp., after the nematodes had penetrated roots of plants, thus indicating absorption of the chemical by potato roots and subsequent nematicidal action of the compound.

Table 1. Effect of Dowco 275 on rough lemon seedlings infected with *Pratylenchus brachyurus*^a.

Treatment rate kg/ha a.i.	Mean measurements			
	Top length in cm ^b	Top weight in g ^b	Root weight in g	Nematodes per g root
0	85.1	34.5	23.7	71
1.1	96.5	44.0	23.5	55
5.6	108.4**	53.3**	29.6	38**
11.2	101.3*	49.5*	25.4	10**
22.4	109.7**	54.9**	26.3	17**
*LSD _{.05}	12.3	12.4	N.S.	24
**LSD _{.01}	16.7	16.9		33

^aRough lemon seedlings were 2 yrs old and growing in Astatula fine sand in 6-in pots. There were 6 replicates per treatment. The test was of 6 mos duration.

^bSum of measurements taken February 20 and May 6, 1974.

CONCLUSIONS

The test presently reported demonstrated the nematicidal action of Dowco 275 against the migratory endoparasite *Pratylenchus brachyurus* infecting citrus. Its value as a pesticide is further enhanced by the lack of phytotoxicity at the rates used and by the growth response of plants to which it was applied.

RESUMEN

La enmienda del suelo con el producto Dowco 275 (0-0 dietil 0-(6-fluoro-2 piridil) fosforotioato) granulado aplicado a razón de 5.6 a 22.4 kg/ha (i.a.) alrededor de la base del tallo de arbolitos de limón rugáceo (*Citrus jambhiri*) de dos años de edad, cultivados en macetas en el invernadero, controló significativamente el *Pratylenchus brachyurus* y estimuló el crecimiento de las plantas. El tratamiento resultó beneficioso a todos los niveles, excepto los más bajos. Las dosis de 5.6 y 11.2 kg/ha produjeron incrementos en altura y peso de los tejidos aéreos de 19-27% y de 43-54%, respectivamente, y redujeron la población del nematodo en 46-88% en comparación con el testigo. La aplicación de dosis más altas del químico no se tradujo en beneficios adicionales apreciables.

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EFFECTS OF NEMATICIDES ON THE NEMATODE POPULATIONS AND YIELD OF TOBACCO [LOS EFECTOS DE TRATAMIENTOS CONTRA LOS NEMATODOS SOBRE LAS POBLACIONES DE LOS MISMOS Y SOBRE LA PRODUCCION DE TOBACO]. N. D. Singh. RRC/CARDI OFFICE, The University of the West Indies, St. Augustine, Trinidad. W. I.

ABSTRACT

In a field experiment, the effects of D-D, DD-MENCS (Vorlex), Ethoprop 6% E.C. and Ethoprop 10% G for the control of plant parasitic nematodes and on yield of tobacco were studied. Nematodes were counted in soil samples taken 54, 114 and 171 days after transplanting. All nematicide treatments significantly reduced *Meloidogyne incognita* after 54 days but, only D-D and Vorlex were significantly different from the control. Increased yields were harvested from plots treated with nematicides.

INTRODUCTION

In a recent survey plant parasitic nematodes were found to be widely distributed in tobacco fields in Trinidad (11). High populations of *Meloidogyne* spp. were often associated with low yield tobacco, but no estimate of the loss in yield is available.