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CONTROL OF *MELOIDOGYNE INCOGNITA* ON *COLEUS BLUMEI* BY DRENCH APPLICATION OF FENSULFOTHION [CONTROL DE *MELOIDOGYNE INCOGNITA* EN *COLEUS BLUMEI* POR MEDIO DE APLICACIONES DE FENSULFOTHION A PLANTAS ESTABLECIDAS]. Nelia Acosta, Assistant Nematologist, University of Puerto Rico Agricultural Experiment Station, Rio Piedras, Puerto Rico 00928.

ABSTRACT

The average top weight and number of twigs in *Coleus blumei* infected by *Meloidogyne incognita* was considerably increased by drench application of Fensulfothion at 20 lb (ai)/acre. The non-treated plants were chlorotic and the aerial parts were significantly reduced by the nematode infection.

INTRODUCTION

Ornamental plants are being used increasingly to decorate parks, gardens, and homes. The acreage used for the production of these crops is low in comparison with the total land area under cultivation, but monetary returns are high because of the intensive cropping and high crop value (3).

Nematodes are one of the most damaging pests of ornamentals, causing serious production losses worldwide. The most important loss is in planting stock which is not marketable because of nematode damage.

Root-knot nematodes, *Meloidogyne incognita* (Kofoid and White) Chitwood probably are the most serious problem for (decorative) ornamental plants in the temperate and sub-tropical regions. Infecting the roots of these plants, they produce galls which interfere with mineral uptake of the plant and cause considerable growth reduction of the aerial parts. To reduce losses in infected plants, it is usually necessary to apply some method of nematode control, such as hot water or chemical treatment.

Drenches of chemicals applied to different ornamental plants have proven effective in controlling nematodes. Streu *et al.* (4) found that drench applications of Fensulfothion, 16 lb/A in 50 ml of water, reduced *Tylenchorhynchus claytoni* populations in Azalea by 75.5%. They also obtained a reduction of 66% of *Pratylenchus vulnus* population in English boxwood (*Buxus sempervirens*) and an increase in top growth by drenches of Thionozin, 16 lb/A in 200 ml of water (4).

In Puerto Rico, growth of the decorative foliage plant *Coleus blumei* Benth is severely affected by *M. incognita*, but an effective method of control has not been developed. An experiment was conducted to determine if drench application of a nematicide would control this nematode on *C. blumei*.

MATERIALS AND METHODS

Eight rooted cuttings of *C. blumei*, planted in nematode-infested soil contained in 1-gal cans, were selected. The average height of the plants was 26.4 cm. To analyze the nematode population per container, a 150-cc soil sample was collected from each container before the application of the nematicide. The nematodes were extracted using the Baermann funnel method (2).

Fensulfothion (Dasanit), non-fumigant nematicide in an emulsifiable concentration, was applied at a dosage of 20 lb ai/A (1). The soil in each container was found to weigh 452 g. Accordingly, 0.6 cc of nematicide in 500 cc of water was applied to each container. The non-inoculated controls received 500 cc of water.

A complete randomized design was used. Each treatment was replicated four times. The plants were put on a table in a greenhouse. Air and soil temperature during the experimental periods ranged from 25-32 C. After 30 days, 150 cc of soil were collected from each plant for nematode analysis. The aerial parts of the plants were weighed, the number of shoots and the height per plant were recorded at harvest.

RESULTS

Data from the experiment are in Table 1. The number of shoots on plants treated with nematicide was higher than in non-treated controls. The fresh top weight in treated plants was higher than in controls. No significant difference was observed in height of the plants. The aerial parts of non-treated plants were chlorotic and reduced whereas those of treated ones were abundant, showing the characteristic purplish-red color of the plant (Fig. 1).

Table 1. Mean height, number of shoots, and fresh top weight of nematized *Coleus blumei* treated with Fensulfothion.

Nematicide dosage	Height (cm)	Number of shoots	Fresh top weight (g)
Fensulfothion (20 lb/A)	16.5	40.5 b ^z	268.1 b
Control	17.0	26.5 a	87.0 a

^zColumn means followed by the same letter are not significantly different ($p = 0.05$) according to "t" test.

The roots of non-treated plants were completely necrotic and heavily galled. In some cases the plants toppled for lack of support. Roots of treated plants were abundant, although moderately galled.

The average population of nematodes per container before treatment was 700 specimens per 150 cc of soil. The average population recovered at the end of the test was 150 specimens in the controls and 200 in the treated plants.

DISCUSSION

The results in this experiment are similar to those obtained by Streu *et al.* (4) who obtained an increase in top development of English boxwood plants using nematicide drenches.

In this experiment the nematicide apparently protected the plant against the nematode's effect and allowed it to increase its root system. The nematicide may act as a nematode inhibitor or narcotic, allowing the plant to proliferate its root system and grow faster than the nematodes can reproduce. The nematicide reduced most of the larval population in the soil. The sessile females in the roots continued producing eggs and consequently more larvae were recovered from soil around roots on treated plants. There were few nematodes in non-treated plants because of lack of feeding sites. There were no symptoms of phytotoxicity shown by treated plants.

Other experiments must be conducted using the minimum amount of this nematicide necessary to reduce the population of nematodes and allow the plant to grow well and increase its aerial parts.



Fig. 1. Two plants of *Coleus blumei*: A, treated with Fensulfothion 20 lb/A, showing abundant foliage; B, non-treated control plant showing chlorotic and reduced foliage.



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RESUMEN

El peso promedio y número de ramas en plantas de *Coleus blumei* infectadas por *Meloidogyne incognita* aumentó considerablemente al aplicar Dasanit a razón de 20 lb (ia) per A alrededor de la base de plantas establecidas. Las plantas no tratadas mostraban clorosis y las partes aéreas de las mismas fueron reducidas significativamente debido a la infección del nematodo.

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INFLUENCIA DE DIFERENTES VARIEDADES DE PAPA SOBRE LAS POBLACIONES DE *HETERODERA* SP. [INFLUENCE OF VARIOUS POTATO VARIETIES ON POPULATIONS OF CYST NEMATODES]. R. Eguiguren, A. Oleas, R. Silva, Salazar 441, La Floresta, Quito, Ecuador.

RESUMEN

Bajo condiciones de campo e invernadero se estudió el incremento de poblaciones de *Heterodera* sp. en las principales variedades de papa cultivadas en Ecuador. Las poblaciones se juzgaron de acuerdo al índice de incremento, esto es: la relación entre población inicial (Pi) y población final (Pf). Las variedades bajo estudio fueron: Chola, Catalina, Uvilla, Puña pertenecientes a la especie *Solanum andigenum* L., y Chaucha, de la especie *S. phureja*.

INTRODUCCION

El nemátodo *Heterodera* sp. constituye un grave problema para los cultivos de papa, por lo que es indispensable medir y determinar los índices de su incremento en variedades de papa comunes entre los agricultores ecuatorianos. Esto es importante para el diseño de medidas cuarentenarias, para establecer el grado de resistencia o tolerancia, y para determinar la frecuencia con que se deben repetir los cultivos en una zona determinada.

Nos referimos a *Heterodera* sp., ya que existe controversia y no se ha determinado aún si estas poblaciones pertenecen a *H. rostochiensis*, *H. pallida*, a otra especie o si son simplemente nuevos biotipos. Esto se dilucidará luego de completar estudios morfológicos, taxonómicos, y fisiológicos, que se están efectuando.

MATERIALES Y METODOS

Los trabajos de campo se realizaron en la Hacienda La Unión de Chillalgallo