

## DISCUSION Y CONCLUSIONES

Los resultados indican que se encuentran relativamente pocos géneros de nematodos fitoparásitos asociados con el ajonjolí, bien por sus propiedades como hospedero o por las condiciones ecológicas intrínsecas de las zonas de siembra. Se considera que los nematodos encontrados probablemente no actúan como factores limitantes en el cultivo, pero es conveniente estudiar el efecto que *Criconemoides* pudiera tener sobre las plantas debido a la asociación con todas las muestras y a las poblaciones altas frecuentemente encontradas.

## ABSTRACT

Seven genera of plant-parasitic nematodes or suspected plant parasites were identified from 101 sesame (*Sesamum indicum* L.) samples taken in the State of Portuguesa, Venezuela. *Criconemoides* and *Helicotylenchus* were found in all the samples. Other genera included: *Tylenchus*, *Tylenchorhynchus*, *Aphelenchus*, *Psilenchus* and *Meloidogyne*. Juvenile forms of *Meloidogyne* were observed in only 1 sample.

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STUDIES ON SELECTED HOSTS OF *ROTYLENCHULUS RENIFORMIS* AND ITS PATHOGENICITY TO SOYBEAN (*Glycine max*) [ESTUDIOS SOBRE HOSPEDEROS SELECCIONADAS DE *ROTYLENCHULUS RENIFORMIS* Y SU PATOGENIA RESPECTO A SOYA (*Glycine max*)]. N. D. Singh, CARDI, The University of the West Indies, Trinidad, W.I.

## ABSTRACT

Six plant species were tested for host suitability to *Rotylenchulus reniformis*: tomato (*Lycopersicon esculentum*), pigeon pea (*Cajanus cajan*) and water grass (*Commelina elegans*) supported large population increases but the nematode population declined under bermuda grass (*Cynodon dactylon*) after 10 wks. Significant reductions occurred in dry weights of tops and roots and linear growth of infested soybean plants 8 wks after transplanting into naturally infested soil. Initial larval inoculations of 500 and 1000 *R. reniformis* reduced the mean weights of roots by 44.7 and 53.7%, the tops by 37.0 and 54.7%, and linear top growth of soybean by 23.1 and 27.5 %, respectively, when compared with non-inoculated controls.

## INTRODUCTION

There is increasing interest in soybean cultivation (*Glycine max* (L.) Merr.) in the Eastern Caribbean but little is known concerning the importance of nematodes

to this crop in the region. Nematode surveys in Trinidad showed that *Rotylenchulus reniformis* Linford and Oliveira, 1940 was associated with important crops and weed species (1, 11, 12, 13). Population densities in many cultivated fields were 1000 to over 2000 larvae per 200 cc of soil. The nematode has also been found associated with damage or disease complexes in many crops (2, 3, 5, 14).

The objectives of this study were to investigate: (i) the host-status of selected plant species to *R. reniformis* and (ii) the effect of *R. reniformis* on soybean growth under controlled conditions.

## MATERIALS AND METHODS

**Host-Status:** Seeds of tomato (*Lycopersicon esculentum* cv. "Floradel"), onion (*Allium cepa* cv. "Texas Early Grano"), pigeon pea (*Cajanus Cajan* cv. "27/4A") and corn (*Zea mays* cv. "X-306") were seeded directly into 10 cm clay pots filled with soil naturally infested with *R. reniformis* [initial population density ( $P_i$ ) = 384 larvae/200g soil]. Seedlings were thinned to 2 evenly spaced plants/pot. Water grass (*Commelina elegans*) and bermuda grass (*Cynodon dactylon*) were propagated from runners, and then transplanted into infested soil. One set of 12 pots containing naturally infested soil, at the same nematode concentration, remained fallow during the experiment.

There were 12 pots of each plant species. After 6 and 10 weeks, 6 pots of each plant species and 6 pots of fallow soil were examined for *R. reniformis*. The nematodes were extracted from the soil by a modification of Cobb's decanting and sieving method (6). Ten % aliquots of the nematodes recovered from each of the replicates were counted.

**Pathogenicity:** This test was conducted to study the effect of *R. reniformis* on growth of soybean (cv. Jupiter). All seeds were selected for uniformity of size and seed-coat, surface sterilized for 10 min in 10% Clorox (0.525% sodium hypochlorite) and then rinsed several times in distilled water. Seedlings were germinated and grown in a methyl bromide-treated soil mixture and after 3 days were transplanted into 10 cm clay pots (2 plants/pot) infested with *R. reniformis* ( $P_i$  = 384 larvae/200 g soil) obtained from cultures maintained on sweet potato plants in the greenhouse. Soybeans transplanted into sterilized soil served as controls. Dry weights of tops and roots and linear growth were recorded from each of 5 pots, 4, 6 and 8 weeks after transplanting. Tops and roots were air-dried for 24 hrs and then weighed. Linear growth was measured from soil level to the tip of the growing point.

In a second experiment, "Jupiter" soybean seedlings were germinated and grown for 10 days in 12 cm clay pots containing a methyl bromide-treated soil mixture. Six replicate pots (two plant/pot) of soybean seedlings were inoculated with 500 and 1000 *R. reniformis* larvae. Plants growing in similar noninfested soil served as controls. The nematodes were pipetted into two 2.5 cm deep holes around the base of the plant in each pot. Ten wks after inoculation, dry weights of tops and roots and linear growth were recorded as described above.

## RESULTS AND DISCUSSION

**Host-Status:** Tomato, pigeon pea and *C. elegans* were good hosts for *R. reniformis* supporting increases of 3.3, 2.3 and 2.4 times that of the fallow check,

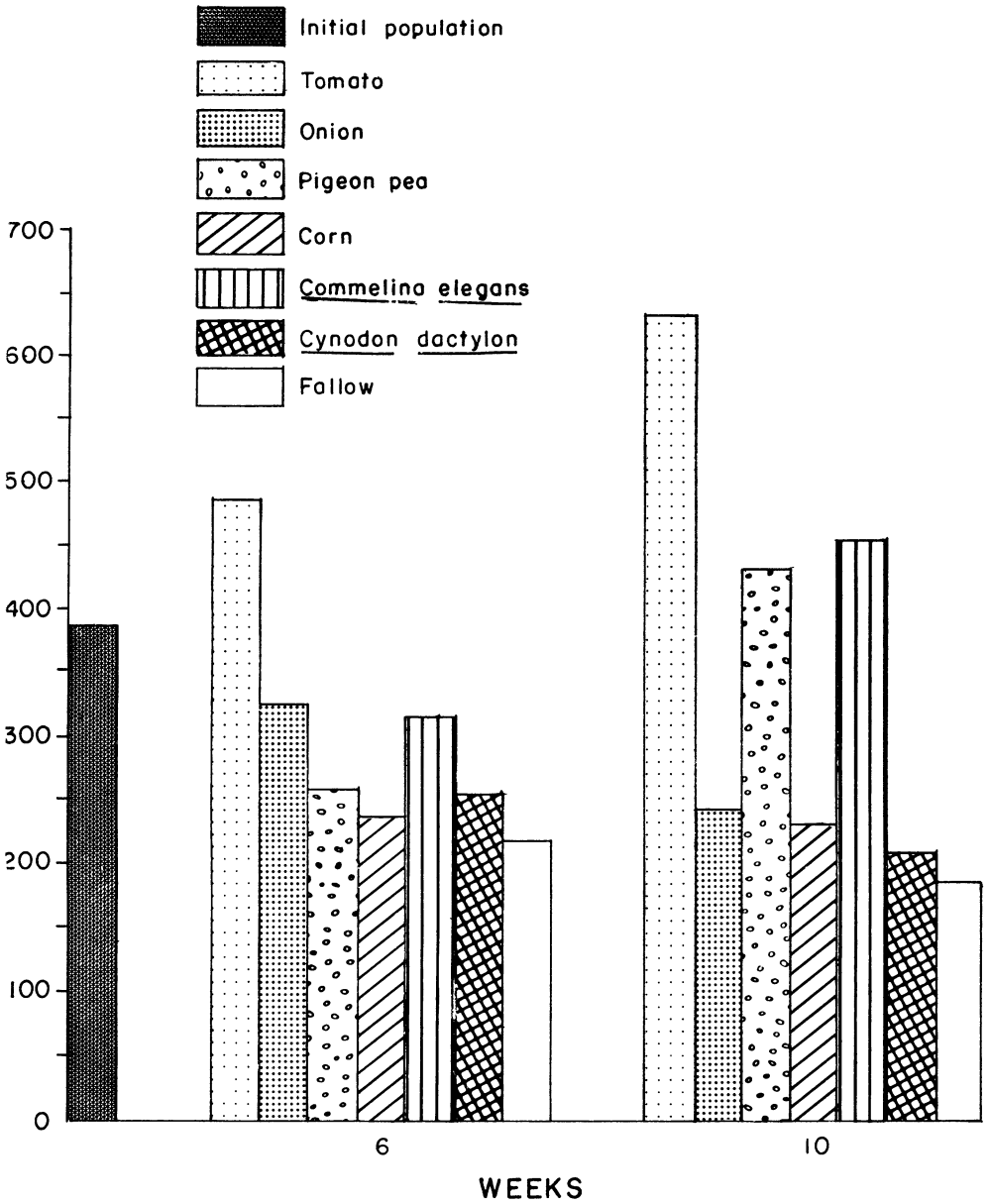


Fig. 1. *Rotylenchulus reniformis* population on selected hosts at different periods. (Average data from six replicates).

respectively, after 10 wks (Fig. 1). Corn, onion and bermuda grass did not support high populations; their populations were slightly greater than in fallow soil at 6- and 10-wk samplings.

Differences in the nematode populations of the different hosts could be partly attributed to an insufficient root system. With pigeon pea and onion, the full population potential was probably not realized because the nematode so damaged the roots that little root system remained for its food supply. Similar effects have been observed with other nematode species (7).

Of particular importance is the high rate of reproduction on *C. elegans*. This common weed in cultivated fields, could support large nematode populations. On the other hand, bermuda grass may be of value in crop rotations in reducing population levels.

**Pathogenicity:** There were significant reductions in top and root dry weights and linear height of infected soybean plants 8 wks after transplanting into infested soil (Table 1). Significant reductions ( $P = 0.05$ ) in top weights also occurred at 6 wks. Marked but not significant reduction (35%) in root weights occurred at the same observation date.

In the second pathogenicity test, 500 and 1000 *R. reniformis* caused a reduction in the mean weight of roots by 44.7 and 53.7%, the top weight by 37 and 54.7% and linear growth of the tops by 23.1 and 27.5% respectively (Fig.2).

Table 1. Growth of "Jupiter" soybean at intervals after transplanting into soil infested with *Rotylenchulus reniformis*.

Time interval (wks)	Treatment	Mean wt. of roots / plant (g)	Mean wt. of tops / plant (g)	Plant ht. (cm)
4	Check	0.68	1.92	15.6
	Infected	0.34	1.78	14.4
6	Check	6.98	8.14	21.7
	Infected	4.52	4.36 *	17.4
8	Check	10.64	11.87	26.2
	Infected	5.92 *	5.98 *	18.3 *

\*Significant difference from check at 5% level.

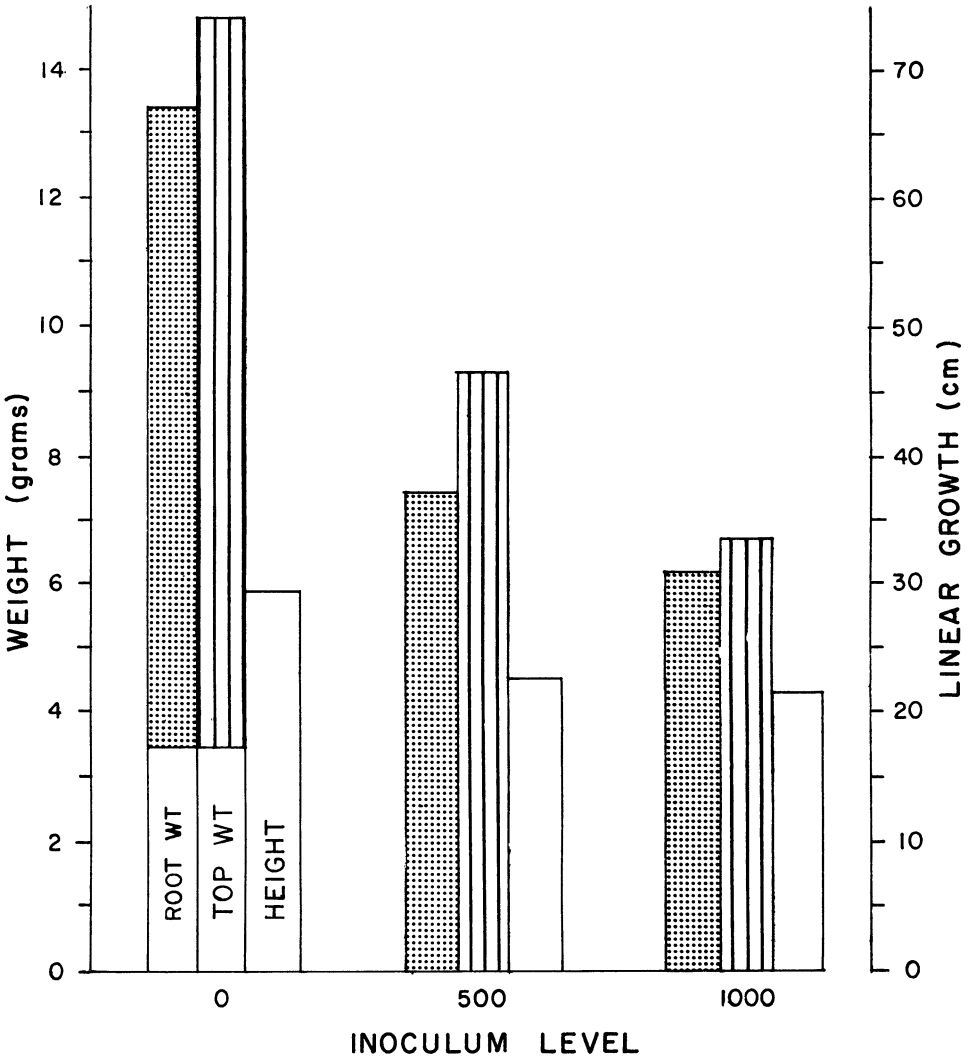


Fig. 2. The effect of *Rotylenchulus reniformis* on soybean grown for 10 weeks in soil inoculated with different levels of the nematode. (Average data from six replicates).

Significant changes in the general appearance of infected soybean plants were observed. Inoculated plants were stunted and had light green leaves compared with dark leaves in noninoculated plants.

These greenhouse studies indicated that *R. reniformis* can cause significant reduction in soybean growth. Rebois (10) reported a reduction of 33.1% soybean dry seed weight due to *R. reniformis*. Several workers (4, 8, 9) also reported severe damage to soybean by this nematode under field conditions. This nematode could become a limiting factor to soybean production in the Caribbean because of the widespread occurrence of indigenous populations and the absence of rotational practices that would reduce nematode population levels.

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#### RESUMEN

Se examinaron 6 especies de plantas para adaptabilidad como hospederos a *Rotylenchulus reniformis*; tomate (*Lycopersicon esculentum*), gandul (*Cajanus cajan*) y herbaje de agua (*Commelina elegans*) sostuvieron incrementos grandes de poblaciones de nematodos pero declinaron la poblacion de nematodos con herbaje de bermuda (*Cynodon dactylon*) despues de 10 semanas. Las reducciones fueron significativas con los pesos secos de las copas y de las raices y los crecimientos lineales de plantas de soya infectadas con *R. reniformis* despues de 8 semanas de trasplante en suelo naturalmente infestado. Cuando se usaron concentraciones de 500 y 1000 de *R. reniformis*, los pesos medianos de los raices mostraron reducciones de 44.7 y 53.7% de las copas 37 y 54.7, y de los crecimientos lineales 23.1 y 27.5%, respectivamente.

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