

Nematodes in potato soils in New Brunswick

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Root-lesion nematodes (*Pratylenchus* spp.) were the dominant plant-parasitic nematodes in potato fields in the Grand Falls region of New Brunswick, Canada. *Pratylenchus crenatus* was more prevalent than *P. penetrans*. The northern root-knot nematode (*Meloidogyne hapla*) and clover-cyst nematode (*Heterodera trifolii*) were not detected in the survey.

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Dans des champs de pommes de terre de la région de Grand Falls au Nouveau-Brunswick (Canada), les principaux nematodes parasites des végétaux identifiés étaient des nematodes radicicoles (*Pratylenchus* spp.). On a signalé plus de *Pratylenchus crenatus* que de *P. penetrans*. On n'a pas trouvé de nematode cécidogène du nord (*Meloidogyne hapla*) ou de nematode à kyste du trèfle (*Heterodera trifolii*) au cours de l'enquête.

Introduction

A nematode survey conducted in 1979 in the Grand Falls region of New Brunswick indicated that root-lesion nematodes (*Pratylenchus crenatus* Loof and *P. penetrans* (Cobb) Filipjev and Sch. Stek.) were the dominant species of plant-parasitic nematodes in potato roots and soils (4). It was also determined that population levels of the northern root-knot nematode (*Meloidogyne hapla* Chitwood) were very low, being detected in only 5% of the root and soil samples. Large populations of either root-lesion or northern root-knot nematodes can reduce potato tuber yields (1,5). This report summarizes the results of a recent nematode survey carried out in potato fields in the Grand Falls region of New Brunswick.

Materials and methods

Soil samples were collected in mid-November, 1987 from seed potato fields at 29 sites in the Grand Falls region of New Brunswick. Twenty-seven locations had been planted with the cultivar 'Atlantic' and two locations had been planted with the cultivar 'Alpha'. The size of the collection sites ranged from 2 to 3 ha and soil type was a gravelly sandy loam with a pH of 5.5-6.0. The usual crop rotation in the region is wheat and/or barley followed by potatoes, and the average rainfall from May to September is about 45 cm.

Twenty soil cores, each 2.5 cm in diameter and 20 cm deep, were taken in the rows at each site and combined to make one composite sample. Each sample was mixed thoroughly and screened through a 2-mm sieve. As the samples were collected 4-6 weeks after harvest, there was very little root material. Consequently, a 50-g subsample of soil together with any root debris was taken from each sample and placed in a modified Baermann pan (9). After 7 days at 20-25°C, root-lesion nematodes that had emerged from the sample were identified

and counted, and other nematode genera were identified with a stereomicroscope at 60X. Extracted nematodes were preserved in 5% formalin and up to 100 nematodes from each sample were selected randomly and examined at 1000X with a compound microscope.

Results

Root-lesion nematodes were the dominant plant-parasitic nematodes and were detected in 24 of 29 sites. The mean population level from 29 sites was 6,300 with a range of 0-22,100 nematodes kg⁻¹ soil. Over 85% of the adult root-lesion nematode females fit the characteristics of *Pratylenchus crenatus*, while the remainder were identified as *P. penetrans* (6). No male root-lesion nematodes were recovered. *Aphelenchoides* spp., or foliar nematodes, were also numerous in most samples but the counts were not recorded. A few specimens of *Aphelenchus* spp., *Helicotylenchus* spp., *Merlinius* spp., *Paratylenchus* spp., *Tylenchorhynchus* spp., and *Tylenchus* spp. were identified. No northern root-knot nematodes (*M. hapla*) or clover-cyst nematodes (*Heterodera trifolii* Gof-fart) were detected in this survey.

Discussion

The results agreed closely with a previous survey conducted in New Brunswick (4). It is possible that some of the sites with high populations of root-lesion nematodes may have had reduced yields. However, *P. crenatus* was the dominant root-lesion nematode species and it is thought to be less harmful than *P. penetrans* to potatoes (2). Furthermore, no information is available from New Brunswick on the effect of nematodes on potato tuber yields. *Aphelenchoides* spp. are not on record as being serious root pathogens (7), and their impact on tuber yields is not known. The absence of *M. hapla*, the only root-knot nematode species recorded to date in New Brunswick (10), and *H. trifolii* would have been due in large part to the inclusion of cereals in the rotation, since both wheat and barley are considered to be non-hosts for these nematode species (3,8).

Conclusions

Plant-parasitic nematodes did not appear to be a serious problem in potatoes in New Brunswick. However, it is likely that large populations of root-lesion nematodes will reduce tuber

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yields to some degree. Further surveys and nematicide trials are necessary to quantify the impact of nematodes on yields of different potato cultivars in New Brunswick.

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