NEMATODE NUMBERS UNDER CULTIVARS OF FORAGE LEGUMES AND GRASSES

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Abstract

Cultivars of timothy supported moderate to high numbers of Paratylenchus projectus, Pratylenchus neglectus and Helicotylenchus digonicus whereas orchardgrass supported only the latter two nematodes well. Red, sweet, and white clovers and alfalfa supported moderate numbers of H. digonicus and birdsfoot trefoil high numbers of P. projectus.

Résumé

Des variétés de Phleua pratense supportèrent des populations variables de Paratylenchus projectus, Pratylenchus neglectus et Helicotylenchus digonicus tandis que Dactylis glomerata supportèrent seulement que les deux dernières espèces de nematode. Trifolium pratense, T. repens, Melilotus alba et Medicago sativa supportèrent des populations modérés de H. digonicus et de Lotus corniculatus, de grande populations de P. projectus.

Eight genera of plant parasitic nematodes were found associated with forages in Ontario (Potter & Townshend, 1973; Townshend, Willis, Potter & Santerre, 1973). Four of these predominated: Pratylenchus Filipjev; Paratylenchus Micoletzky; Nelicotylenchus Steiner; and Meloidogyne Goeldi. Almost without exception all Ontario forage fields were infested with one or more of these four genera. Subsequently the authors had the opportunity to sample pure stands of forage legumes and grasses in test plots managed by the Department of Crop Science, University of Guelph, at Elora, Ontario. The results from these samples are presented.

The forage species were growing on London or Guelph loam soil types and were sampled in June and November, 1971. Ten cores were taken to a depth of 20 cm with a 2.5 *cm* soil sampler close to the crowns of the plants. Cores from each plot were thoroughly mixed and nematodes extracted from 50 g subsamples in Baermann pans (Townshend 1963) for 1 week, counted, and recorded as the number per 0.45 kg of soil.

Three species of nematodes, Pratylenchus neglectus (Rensch) Chitwood & Oteifa, Paratylenchus projectus Jenkins, and Helicotylenchus digonicus Perry were found. Alfalfa (Medicago sativa L.) supported large numbers of H. digonicus and much smaller numbers of P. neglectus and P. projectus (Table 1). White clover (Trifolium repens L.), red clover (Trifolium pratense L.), and sweetclover (Melilotus alba Desr.) supported large numbers of H. digonicus and small numbers of P. neglectus. Paratylenchus projectus developed large numbers only under white clover. Sainfoin (Onobrychis viciaefolia Scop.) supported small numbers of P. projectus and H. digonicus. Cultivars of birdsfoot trefoil (Lotus corniculatus L.) supported very large numbers of P. projectus, small numbers of H. digonicus, and none of P. neglectus.

Bromegrass (Bromus inermis Leyss.) supported large numbers of P. neglectus and a few of H. digonicus (Table–I). Cultivars of orchardgrass (Dactylis glomerata L.) supported large numbers of both P. neglectus and H. digonicus. The four cultivars of timothy (Phleum pratense L.) listed in Table 1 supported all three nematodes well, particularly P. projectus and H. digonicus. The other 24 cultivars of timothy sampled but not listed supported similar numbers of these nematodes.

This pattern of nematode multiplication may explain, in part, the success of the bromegrass–alfalfa mixture now recommended in Ontario. Mixtures of birdsfoot trefoil, red clover, or sainfoin with broneqrass may offer promise for nematode control and deserve study. Perhaps a mixture of bromeqrass, birdsfoot trefoil, and red clover would be even more suitable. Red clover could develop initially with bromeqrass until tne slower growing birdsfoot trefoil developed to take over as the red clover died out. The effect of timothy in forage mixtures needs further study because of the number of nematode species that multiply under this qrass.

An assessment in microplots of crop loss caused by each nematode species on each forage species is essential before an intensive program is initiated to search €or nematode resistance in forage species. Other assessments are required as well, such as the

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effect of combinations of forage species on the population development of individual nematode species and conversely the effect of individual forage species on populations of combinations of nematode species.

Literature cited

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Table 1. Number of nematodes associated with cultivars of forage legumes and grasses

	Nematodes/0.45 kg soil					
	Lesion		Pin		Spiral	
	June	Nov.	June	Nov.	June	Nov.
Legumes						
Alfalfa						
Saranac	150	100	20	0	3,130	1,730
Vernal	130	180	50	20	2,460	**1,000**
White clover						
Merit*	200		9,040		5,150	
Red Clover *						
Canadian common double-cut	30		60		4,680	
Sweetclover						
Goldtop*	160		20		2,330	
Sainfoin						
Melfort	*0*	*0*	0	70	10	*0*
Birdsfoot trefoil						
Empire	0	0	3,880	7,000	*0*	50
Leo	*0*	*0*	2,480	12,800	*0*	20
Maitland	*0*	0	6,560	11,500	0	0
Grasses						
Brome						
Saratoga†		**1,900**		0		100
Orchard						
Kay*	1,800		20		3,900	
Rideau	930		60		3,000	
OSG-5	4,320		50		2,850	
OSG-7	1,800		60		3,070	
Timothy						
Champ	600	9,400	1,000	5,000	6,400	LO,800
Eskimo	200	5,000	400	11,600	5,500	6,200
S-352	400	11,600	5,000	9,000	7,200	7,800
Topaz	300	1,800	2,000	4,600	2,900	12,600

* Crop ploughed down.

† Crop not sampled in June.