PLANT-PARASITIC NEMATODE GENERA ASSOCIATED WITH CROPS IN ONTARIO IN 1971

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In 1971 personnel of the Ontario Nematode Diagnostic and Advisory Service processed 802 samples, which represented a broad cross-section of Ontario crops. Extension specialists submitted 350 samples in 1971 an appreciable increase from the 213 samples submitted in 1970 (1). In contrast, agricultural chemical companies concerned with assessment of candidate nematicides on flue-cured tobacco submitted only 194 samples in 1971 compared with 651 in 1970. The number of samples submitted by growers has not changed for the past 2 years. As techniques become available to predict whether treatment with a nematicide is required to prevent nematode damage it is possible that the number of grower samples will increase. Studies on sampling techniques and on relationships between nematode population densities in the soil and crop loss are now under way at the CDA Research Station, Vineland Station, Ontario.

Table 1 shows essentially the same general pattern for the prevalence of the common nematode genera as obtained in 1970 (1). The root-lesion nematodes Pratylenchus spp. continue to be the most prevalent and, economically, the most important nematode pests in Ontario. Pratylenchus spp. were associated with 46 of the 56 crops sampled. Pin nematodes (Paratylenchus spp.) were the second most prevalent, being associated with 39 of the 56 crops sampled. Though the economic importance of pin nematodes has not been established in Ontario it is suspected that these pests affect the development of roots on rhubarb sets resulting in poor yields, particularly in forcing sheds, and occasionally in the field. The northern root-knot nematode, Meloidogyne hapla Chitwood 1949. occurred in 13% of all crops sampled. It was diagnosed in 31% of the vegetable crops sampled and it is the most important nematode pest of vegetables grown on muck soils in Ontario. This pest has also caused serious damage to flue-cured tobacco seedlings in greenhouse seedbeds, but it has not caused losses in the field. There is no indication of any increase in the prevalence of the northern root-knot nematode in flue-cured tobacco soils. Apparently this is because rye is not a host for this species and the common rotation is rye-tobacco. The oat-cyst. nematode, Heterodera avenae Filipjev 1934, continues to be the most important species of this genus in Ontario and in association with a Pratylenchus sp. causes considerable damage to successive corn (Zea mays L.) crops. Spiral (Helicotylenchus spp.), stunt (Tylenchorhynchus spp.), dagger (Xiphinema spp.), and ring (Criconemoides spp.) nematodes are relatively common in Ontario soils but at this time the importance of these genera is unknown.

The 1971 survey of forages in eastern Ontario showed that root-lesion, pin, spiral, and root-knot nematodes (M. hapla) were common plant-parasitic genera associated with alfalfa, red clover, white clover, trefoil, brome and timothy. Stunt, cyst, ring, and dagger nematodes were also diagnosed in some of the samples.

Observations associated with field research activities in 1971 showed the needle nematode, Longidorus elongatus Thorne and Swanger 1936, to be present in a flue-cured tobacco field at Delhi and in a peach orchard at Harrow. At both locations the soil was sandy. It is probable that this nematode is more prevalent in Ontario than had been suspected. An unidentified species of Meloidogyne, only the second species of this genus to be found in the field in Canada, was found on several cultivars of turf grasses at Preston. The southern root-knot-nematode, Meloidogyne incognita Chitwood 1949, is a perennial problem on cucumber and tomato in many greenhouses, but is not a threat to the field production of these crops as it is unable to survive in the field in Ontario.

An infestation of onions by stem and bulb nematode, Ditylenchus dipsaci Filipjev 1936, in Erieau Marsh, Kent County, was confirmed in 1971. It had previously been reported (2) on onion in the point Pelee Marsh, Essex county. A bud and leaf nematode, Aphelenchoides sp. (tentatively identified as A. fragariae Christie 1932) caused severe damage to begonia in a greenhouse in Leamington and 4000 plants originating from both Canada and the USA were destroyed.

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Table 1. Genera of plant-parasitic nematodes identified from soil samples processed by the Ontario Nematode Diagnostic and Advisory Service in 1971

Crop	NO. of samples	cyst (Larvae)	Root knot	Root lesion	Spiral	Stunt	Pin	Dagger	Ring
Alfalfa	3	18/2**	5/1	833/3	1204/2	39/2	1305/2		
Apple	6			1025/3			175/3		
Barley	3	900/2		651/3	3675/2	350/2	1125/2		
Beans	1								
Birdsfoot trefoil	1			3600/1			100/1		
Cabbage	3								
Carrot	8		225/2	50/1			1925/2		
Cereals	1						6150/1		
Celery	1		350/1				50/1		
Cherry	73			774/71		200/1	334/65		
Cherry (sour)	7			1850/7			542/6	750/1	
Chrysanthemum	1		2150/1				200/1		
Clover (sod)	1		50/1	4050/1					
Clover (red)	2	700/1	1100/1	1900/1	50/1	100/1	1150/2		
Corn	25	100/3	50/1	487/23	168/3	100/3	455/5		
Corn (sweet)	1			1600/1		250/1	50/1		
Crucifers	2	1400/1							
Fallow	9			850/6		100/1	480/5		
Gladiolus	3			1250/1			4083/3		
Grain (mixed)	4			50/1			250/1		
Grape	7	50/1		325/6	190/5	100/1	388/4		
Grass	5			450/2		50/1	1460/5		50/1
Grass (orchard)	1			150/1			1250/1		
Hay	1								
Juniper	5			100/1			50/1		950/1
Kale	1			100/1		50/1			
Lettuce	1								
Mushroom	6			50/1					
Oats	2	2550/1	50/1	950/2	150/1		3150/1		
Onion	21		2317/5	163/3	175/4	38/2	168/8		
Pasture	1			50/1					
Pea	1			5200/1					
Peach	16			1501/16		250/1	625/15		63/3
Plum	2			1475/2			600/1		
Potato	7		400/2	150/3	50/1	50/2			
Radish	2			150/1					
Raspberries	1			250/1	100/1				
Rhubarb	3			1117/3			4017/3		
Rhubarb (forcing)	1			50/1			3250/1		
Rose	11		15,850/1	650/8	300/2		100/2	750/1	
Rutabaga	2								
Rye	28		100/1	437/25		136/7	399/12	100/1	400/1
Shrubs (evergreens)	6			288/4			50/2		60/1
shrubs (*Taxus*)	1			50/1		50/1			
Shrubs (dogwood)	1			800/1			50/1		
Sod	1			200/1			200/1		
Spinach	1								
Spruce (blue)	1			50/1			100/1		
Strawberry	19		50/1	2083/17			273/13		
Tobaoco (seedbed)	2								
Tobacco	115	150/1	625/2	622/91		125/5	155/33		
Tobacco*	194		50/1	4391/176	50/2	50/3	126/90		
Tobacco (survey)	148		169/31	735/146		86/21	246/117		50/4
Tomato (greenhouse)	14			663/4		110/1			
Tomato (field)	1			250/1			50/1		
Turnip	1			50/1			50/1		
wheat	8	50/1		585/6	50/2	50/3	570/7		
Miscellaneous	9			193/7	50/1		115/5		
Total	802								

* samples from nematicide trials - averages are not included because of treatment effects.

** Average number of nematodes per lb of soil/number of samples containing the nematode.

Literature cited

1. C.F. Marks, J.L. Townshend, J.W. Potter, Th.H.A. Olthof, and A. Cornelisse. 1971. Plant-parasitic nematode genera associated with crops in Ontario in 1970. Can. Plant. Dis. Surv. 51:127-128.
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