Notes on Some Plant Nematode Problems, 1951

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The oat nematode, Heterodera avenae, which has an interrupted range between Waterloo and Peterborough in southern Ontario, caused injury in 1951 somewhat below the average, but this important pest of oats, barley, and some other cereals continues to spread slowly. However, the present range is not altogether clear because of the lack of recent surveys. A fungous parasite of this nematode was observed near Conestogo, Ont., in June, 1951. Although this nematode obviously has some natural enemies it causes very considerable crop loss from time to time and warrants greater attention than it has received.

In the Blackwell area of Ontario, infestations of the sugarbeet nematode, Heterodera schachtii, have increased during the past two years although there is no evidence of spread beyond the regions previously reported infested. The main reason for the rise in populations is probably the lack of sufficient attention to the introduction of suitable crop rotations since the removal of all other restrictions in this area a few years ago. The danger of spread of this pest from the Blackwell area may be said to have greatly increased and should be a matter of concern. Our studies on chemical and cultural control have shown that the populations of these nematodes can be greatly reduced but not eradicated. In the Canadian Insect Pest Review 29 (7): 247-250. 1951), R. H. Mulvey gives a summary of the records of host plants obtained for this pest at Blackwell. Besides sugar beets, these are: mangel; garden beet; cabbage; cauliflower; kohlrabi; broccoli; kale; brussels sprouts; rape; rutabaga; turnip; radish; garden cress; spinach; sweet alyssum, Alyssum maritimum; sweet william, Dianthus barbatus; love-lies-bleeding, Amaranthus melancholicus; portulaca, Portulaca grandiflora; candytuft, Iberis amara; dianthus, Dianthus; curled dock, Rumex crispus; shepherd's-purse, Capsella bursa-pastoris; wormseed mustard, Erysium cheiranthoides; charlock or wild mustard, Brassica arvensis; purslane, Portulaca oleracea; oak-leaved goosefoot, Chenopodium glaucum; and rhubarb, Rheum rhaponticum. The identification of this nematode from Chenopodium glaucum points to the possibility of some confusion between this plant and lamb's-quarters, C. album, in other records of host plants. At Blackwell viable cysts have also been recovered from wallflower, Cheiranthus cheiri, but the identification of the nematode species involved is not yet certain.

The potato-rot nematode, Ditylenchus destructor, did not cause any appreciable crop injury in Prince Edward Island in 1951 and infestations have declined although much of the decline is probably due to the removal of all infested land from potato production. However, in any reference to areas of infested land on the Island it should be borne in mind that most of the land termed infested has never shown more than light infestations and the presence of even one infested potato tuber has been sufficient to cause a whole field to be classified as infested. During the past two years a number of the infested fields have been treated with fumigants, but these fields are not yet back in potato production. In a current issue of the Canadian Insect Pest Review (Vol. 30, 1952), V. Henderson has brought together our records of host plants obtained in Prince Edward Island. These studies have been particularly

difficult as the range of taxonomic characters of this species appear to be rather wider than had previously been assumed and the possibility of other, undescribed species being present has always had to be considered. In addition, differences in degree and type of invasion in different plant species have been revealed so that in some cases the plant may be harbouring or sheltering the nematode without functioning as a true host plant. Besides the potato, host plants listed by Henderson include field mint, Mentha arvensis; red clover, Trifolium pratense; alsike clover, hybridum; onion, Allium cepa; and blue-eyed grass, Sisyrinchium angustifolium; and records presently classified as tentative are common vetch, Vicia sativa; mouse-ear hawkweed, Hieracium pilosella; butter-and-eggs, Linaria vulgaris; silvery cinquefoil, Potentilla argentea; sheep sorrel, Rumex acetosella; yellow hop clover, Trifolium agrarium; perennial sowthistle, Sonchus arvensis; and common dandelion, Taraxacum officinale.

The name Pratylenchus pratensis (de Man, 1880) Filipjev, 1936, has been used for the meadow nematodes but they have been increasingly recognized as a complex including several undescribed species. However, a redescription of P. pratensis by Thorne has now enabled us to use this name in a somewhat more restricted sense. If Thorne's restricted designation is used the form or forms previously reported as attacking peaches and tobacco at Harrow, Ont., are not P. pratensis. Their exact identification will require further study as many of the descriptions of species belonging to this genus are so inadequate that some revisions will be necessary.

Other records include a species of root-knot nematode, Meloidogyne hapla Chitwood, 1949, from astilbe roots, Port Burwell, Ont.; Aphelenchus avenae Bastian, 1865, from potato tubers and daisy roots, York, P. E. I.; Aphelenchoides parietinus (Bastian, 1865) Steiner, 1932, from potato tubers, Miscouche, P. E. I.; and Diplogaster sp. from seeds of Pinus nigra Arnold var. cebennensis (Gren. & Godr.) Rehder, Angus, Ont.

It is hoped that it may be possible to give more and more attention to the free-living nematode populations of soils in Canada. In soils supporting plant growth these nematodes are very numerous, with populations of many millions to the acre. These soil inhabitants have been largely ignored, certainly in Canada, and probably the majority of species to be found in our soils have yet to be named and described. In referring to such nematode populations in the soils of the U. S. A., Dr. G. Steiner (U. S. D. A. Pl. Dis. Reporter Suppl. 195, 1950, p. 467), voices the need for study of these forms very accurately when he says, "Soil science cannot afford to further ignore this component of soil life. It would appear that our present day conception of the biotic complex in the soil is at least largely incomplete if not erroneous through the one-sided consideration of only earthworms, bacteria, fungi, and noxious insects". In 1914 the late N. A. Cobb (Trans. Am. Micros. Soc. Vol. 33. 1914) named and described two species of free-living nematodes from "fresh water ponds, Cape Breton Island, Canada". These were Oncholaimus punctatus Cobb, 1914, and Chromadora canadensis (Cobb, 1914) W. Schneider, 1924. The very meagre knowledge of free-living nematodes in Canada is almost entirely derived from incidental collecting by a few visiting nematologists. Species that have been recently recorded from this laboratory in the Canadian Insect Pest

Review (Vol. 29, No. 7) include records by R. H. Mulvey of Boleodorus thylactus Thorne, 1941, from clover soil, Blackwell, Ont., and Tripyla affinis de Man, 1880, from near a drainage ditch, Blackwell, Ont. In the same publication the writer has recorded Aporcelaimus americanus Thorne & Swanger, 1936, from tobacco soil Harrow, Ont.; A. vorax Thorne & Swanger, 1936, from apple orchard soil, Kentville, N.S.; Dorylaimus bastiani Buetschli, 1873, from meadow soil, Little York, P.E.I.; Dorylaimus intermedius de Man, 1880, from oat soil, Little York, P.E.I.; Mononchus (Mononchus) papillatus (Bastian, 1865) Cobb, 1916, from meadow soil, northeast of Norton, N.B.; and Xiphinema americanum Cobb, 1913, from lawn soil and from lakeshore sod, Sunnydale, Ogden Co., Que. It will be noted that this list includes some important species of predacious nematodes.

Phenological Data - 1951

Records for the 1951 season were made by B. Peturson at Winnipeg, R.C. Russell at Saskatoon and S.G. Fushtey at Edmonton. Native plants at all three places flowered fairly close to the normal date throughout most of the season except for a distinct lag at the beginning of the season at Saskatoon and Edmonton.

Wheat was sown very late at Winnipeg and Saskatoon but on about the usual date at Edmonton. At Winnipeg wheat developed and ripened so rapidly that it was mature at about the average date. At Saskatoon and Edmonton ripening was held up by cool, rainy weather and the crop was about two weeks late in maturing at both places (R.C. Russell).

Anthesis dates at London, Ont., (no previous records) were as follows:-

Acer saccharinum	30/3	Pinus sylvestris	21/5
Ulmus americana	14/4	Juglans nigra	26/5
Acer negundo	30/4	Catalpa speciosa	23/6
Quercus rubra	17/5	Tilia americana	5/7

(W.H. Minshall)

Anthesis dates at Ottawa, with number of days departure from average, for 8 plants from the main list were as follows:-

Populus tremuloides	20/4	3L	Anemone canadensis	26/5	10E
Acer negundo	1/5	2L	Bromus inermis	18/6	1E
Prunus pensylvanica	9/5	6E	Phleum pratense	24/6	1E
Smilacina stellata	22/5	2L	Solidago canadensis	3/7	2L