Almost continuous wet weather from late May to mid June delayed planting in P. E. I. and aggravated the severity of apple scab and several other foliage parasites. The small amount of frost in the ground caused volunteer potato plants to be numerous, but hot, dry weather from mid June until late in the season prevented what might have been a severe epidemic of late blight. Seed-piece decay and black leg were negligible, but potato scab was unusually severe. Fusarium wilt was found in one potato field, a further result of the warm, dry soil. Cucumber scab was very light, in contrast to 1951, as were smuts of oats and barley and crown rust of oats. Several cases of blossom-end rot of tomato and one of black heart of celery were reported late in the season (J. E. Campbell).

Notes on Some Nematode Problems, 1952

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The cyst-forming nematodes, belonging to the genus Heterodera, are plant parasites that are difficult to control, and once populations of these species have established themselves in a field eradication is usually considered practically impossible. In such cases control measures are aimed at the reduction of the nematode population, chiefly by suitable crop rotations, and, to a lesser extent, by fumigation. The cost of fumigation must be balanced against the value of the crop, and, when the same measure of control may be obtained by less expensive cultural methods, it is not recommended. Many of these species are responsible for important crop loss, and this, coupled with the known difficulty of control, tends to focus a justified interest in new outbreaks of these pests and the status of those already established within our borders.

The sugar-beet nematode, Heterodera schachtii Schmidt, 1871, did not spread appreciably in Ontario in 1952, but in the Sarnia area the populations remained at a high level. Steps have now been taken to enforce recommendations for adequate crop rotation more thoroughly. New host records for this species from Sarnia, Ontario, were obtained by R. H. Mulvey in 1952. These were Swiss chard, Beta cicla., and horseradish, Armoracia lapathifolia. This species has not yet been recorded in Canada in any province except Ontario. The oat nematode, Heterodera avenae Lind, Rostrup, and Ravn, 1913, is more widely distributed in Ontario but does not occur in areas where the sugar-beet nematode is found. The indications are that this nematode is continuing to spread and continuing to cause crop loss of importance. The oat nematode is not found elsewhere in North America. The wheat nematode, Heterodera punctata Thorne, 1928, was named and described from specimens found in wheat in Saskatchewan and Alberta. The present status of this pest in the Western Provinces is unknown. The pea nematode, Heterodera goettingiana Liebscher, 1892, was identified from British Columbia in 1952, and possibly an additional form is present there; this may be Heterodera schachtii var. trifolii Goffart, 1932, although the host plants recorded make the situation somewhat obscure. In examinations of clover plants growing on the Central Experimental Farm at Ottawa

Miss G. L. Brown of the Ottawa laboratory discovered a few nematode cysts that have been tentatively identified as of the same variety, trifolii. Heterodera rostochiensis Wollenweber, 1923, has not been recorded in Canada, but an important interception of this pest was made recently by officers of the Canada Division of Plant Protection from soil containing ornamentals belonging to a passenger from Germany. Specimens of Heterodera cacti Filipjev and Schuurmans Stekhoven, 1941, were previously intercepted on cactus plants.

Nematodes belonging to the genus Ditylenchus include many species of important plant parasites. In the past the bulb and stem nematode, Ditylenchus dipsaci (Kühn, 1857) Filipjev, 1936, has been recorded from many plant hosts, but it is now rather generally recognized that a number of distinct species are involved, although most of them have not yet been named and described. In 1945 Thorne redescribed dipsaci from teasel and also a new species from potato that he named destructor. At the same time he recognized that several additional species remained in this complex and still awaited identification. Ditylenchus destructor Thorne, 1945, was reported from Prince Edward Island in 1946, and since that time considerable attention has been focused on this outbreak. However, the earlier apprehension in regard to this pest has greatly declined, and it has been difficult to find land sufficiently infested for experimental purposes. In addition, vigorous regulatory measures are proving effective. There are records of Ditylenchus dipsaci from Ontario, British Columbia, New Brunswick, and Alberta attacking a variety of plants. It is probable that these records represent the activities of more than one species. Ornamentals are not infrequently attacked, particularly in greenhouses, and a form of this species complex attacks alfalfa in Alberta.

During our experiments at the Ottawa laboratory it has been noticed that the populations of the potato-rot nematode in potato tubers exhibit a remarkably wide range of characters, and the possibility should be recognized that more than one species may be involved in these infestations. At least in other parts of the world it seems rather evident that more than one species of the dipsaci complex will feed and develop in potato tubers. The variation of morphological characters of what is presently called destructor, when the potato populations are transferred to other host plants, is referred to by Thorne in the Proceedings of the International Nematology Symposium held at Rothamsted, England, in 1951. The possibility of these variations representing a food response warrants careful consideration, but at least equal consideration of the possibility that more than one species is involved in these populations requires careful attention. It has been reported both from British Columbia and from England that evidence from reciprocal transfers of potato-iris nematode populations shows that the iris nematode is identical with Ditylenchus destructor from potato. This may be the case, but, until the identities of the potato populations and of the iris populations have been more clearly established, these reports should be accepted with these reservations.

Other injurious species of Ditylenchus in Canada are represented by Ditylenchus radicicola (Greeff, 1872) Filipjev, 1936, and Ditylenchus graminophilus (Goodey, 1933) Filipjev, 1936. There has been no report of the first species since it was first found in Saskatchewan by Vanterpool in 1948. Present indications are that the second of these species is rather widely distributed in the Province of Quebec, and there is one record of this pest from Manitoba.

Pratylenchus pratensis (de Man, 1880) Filipjev, 1936, in the past has been called the meadow nematode, but this is also a complex involving several species, not all of which attack meadow crops. These are now more accurately referred to as root-lesion nematodes, and the group is now undergoing considerable revision. Thorne redescribed Pratylenchus pratensis from specimens collected in the type locality. In 1952 this species was found causing damage to red clover on the Central Experimental Farm, Ottawa. Specimens of root-lesion nematodes were examined from tobacco and peach soil from Harrow, Ontario, and it is evident that these soils contain at least two species of Pratylenchus other than pratensis, although the latter may also be revealed with further collecting. Root-lesion nematodes appear to be rather prevalent in Ontario and have been previously recorded in Manitoba and British Columbia.

A grass nematode, Anguina agrostis (Steinbuch, 1799) Filipjev, 1936, is known to occur in both Nova Scotia and Saskatchewan but may be more widely distributed than these records indicate, as no special search has been made for this pest. During 1952 this species was intercepted on plants and seed coming from New Zealand and Germany.

Root-knot nematodes belong to the genus Meloidogyne. Until Chitwood made his revision of this group in 1949 all these forms were considered as a single species. The situation in regard to these new species is not yet completely clarified, and neither is there an adequate picture of the species of this genus that may be present in Canada. Meloidogyne hapla Chitwood, 1949, is present in Canada and may be the commonest species here, but sufficient records are not yet available to warrant a definite conclusion. Meanwhile, records continue to accumulate of "root-knot nematodes" from Prince Edward Island, Nova Scotia, New Brunswick, Quebec, Ontario, and British Columbia. Interceptions of these pests on plants from foreign countries are made from time to time.

Aphelenchoides ritzema-bosi (Schwartz, 1911) Steiner, 1932, was identified in 1952 attacking chrysanthemums in a private garden at Sarnia, Ont. This pest is more frequently reported in Canada from greenhouse plants. Aphelenchoides fragariae (Ritzema Bos, 1891) Christie, 1932, had been previously recorded from Ontario and British Columbia, and Aphelenchoides parietinus (Bastian, 1865) Steiner, 1932, is probably rather widespread. The latter species appears to be another complex, and also Aphelenchus avenae Bastian, 1865, which is encountered very frequently. The importance of these two species is doubtful.

Probably because of their large size, specimens of mermithids and of gordians arouse the interest of collectors and are sent in to the Ottawa laboratory from time to time. Species of mermithids were received in 1952 from a number of localities in Ontario and from one in Nova Scotia. Gordians were received from Ontario and Quebec.

Phenological Data - 1952

The spring of 1952 was extremely early at Winnipeg and moderately early at Saskatoon and Edmonton. Toward the end of the growing season, some of the summer flowers bloomed at about the normal time, but the majority came into bloom somewhat early.

The development of the wheat recorded in the accompanying table was influenced by the time it was sown. At Winnipeg it was early throughout the growing season. At Saskatoon it was sown and matured a little late. At Edmonton it was sown rather early and emerged early but cool weather toward the end of the season appeared to delay its maturity (R. C. Russell).

Anthesis dates at Ottawa, with number of days departure from average, were as follows. Marker plants are shown by an asterisk.

*Acer saccharinum	12/4	1L	Bromus inermis	16/6	2E
Populus tremuloides	18/4	2L	Sambucus nigra	18/6	1L
*Ulmus americana	21/4	4E	Rhus typhina	21/6	3E
*Acer negundo	27/4	1E	Catalpa speciosa	4/7	6L
*Acer saccharum	8/5	N	Phleum pratense	24/6	N
Prunus pensylvanica	8/5	5E	*Tilia americana	6/7	1L
Smilacina stellata	26/5	7L	Cephalanthus occidentalis	16/7	3E
*Pinus sylvestris	27/5	1E	Solidago canadensis	28/7	3E
Anemone canadensis	4/6	1L	Cassia hebecarpa	13/8	14L
*Carya cordiformis	8/6	5E	*Hamamelis virginiana	19/9	6E

(I. J. Bassett)