well as late infections of apple scab. The summer was known locally as "wet and cool" in spite of average rainfall and nearly normal mean temperatures. The hurricane "Carol" was more destructive to crops mechanically than in providing conditions favourable to pathogenic organisms. The autumn was open, but most trees were fully dormant before the frosts in November with the exception of some apple orchards in which the foliage was frozen on the trees (J.F. Hockey).

At Charlottetown, P.E.I. mean temperatures were above normal for the first four months of 1953. Little or no injury to overwintering crops or ornamentals occurred despite the frequent lack of snow cover. Snow on 13 March covered the ground to the depth of 5 inches but had disappeared by 23 March. Although growth made an unusually early start it received a setback early in May. On 3 May six degrees of frost were recorded at Charlottetown; it caused slight injury to the foliage of some maple and horsechesnut trees.

Because of the unusually dull, wet weather that prevailed throughout the growing season, several plant diseases caused more than the normal amount of damage. Apple scab was severe in all orchards, both on foliage and fruit. Black leg was general in potato fields. A severe epidemic of late blight developed on the potato foliage, but the disease did not cause as much tuber rot as expected on account of the rapid death of the vines in unsprayed and poorly sprayed fields. In the few areas where club root is a problem, fields of Laurentian swedes were completely destroyed. Verticillium wilt, which normally takes its toll in certain potato varieties, did not present as serious a problem as usual. Good growth was maintained throughout the season and pastures, in particular, provided excellent herbage (J.E. Campbell).

The early part of the winter was mild in eastern Newfoundland. Some snow fell in January, but rain on 17 days in the month quickly melted the snow. March was the coldest month of the year with a mean temperature of 26.2°F. and a low of 7.5°F. As a result of the low temperatures, winter killing was severe in clover, orchard grass, strawberries, lilac and birch trees. From December to April a total of 70.3 inches of snow and 19.52 inches of rain were recorded. Rain and snow fell on 25 days in April. May was cool with rainfall slightly above average. June was relatively warm with rainfall below average. Frequent showers during the late summer and autumn favoured late blight development, but a frost in early August caused some damage to the vines and seemed to check its further spread. The weather was warm into October but frosts on 1, 21 and 22 October caused defoliation of potato plants and some injury to the tubers (G.C. Morgan).

Notes on Some Nematode Problems, 1953

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The golden nematode, Heterodera rostochiensis (Wollenweber, 1923) Franklin, 1940, has not yet been found in Canada and considerable attention has been given to measures aimed at preventing its introduction. It has been recorded from the northern part of Mexico. Some interest has been focused on what appeared to be very similar forms that have been encountered elsewhere, but these have since been found to be distinct species. One of these forms was found

attacking tobacco in Connecticut and it has now been named Heterodera tabacum Lownsbery & Lownsbery, 1954. Distinct taxonomic characters have been recorded for this species and it does not attack the potato, and attempts to rear the golden nematode on tobacco have been unsuccessful. Another species of this group is Heterodera leptonepia Cobb & Taylor, 1953, which was intercepted by officers of the U.S.D.A. from soil with small potatoes, presumably grown in Peru. These three species, as well as the wheat nematode, Heterodera punctata Thorne, 1928, have a cyst with a rounded posterior. This is in contrast to the lemon-shaped cysts of the majority of the species belonging to this genus.

The sugar-beet nematode, Heterodera schachtii Schmidt, 1871, has shown no sign of spread in Canada beyond the areas previously reported. Experimental work on this pest is being continued at Sarnia and some of the new information being obtained on control will have indirect value in attempting to deal with new infestations of other species of this genus that may occur. Side-row applications of fumigants proved ineffective. Other fumigation methods may greatly reduce the nematode populations, but crop rotation is the more economical means of control.

The oat nematode, Heterodera avenae Lind, Rostrup, and Ravn, 1913, continued to present an important problem in Ontario. Crop rotation is of considerable value in reducing the populations. However, as corn has been reported as a host of this species, this fact must now be taken into consideration in planning the rotations.

The situation in regard to other species of Heterodera reported previously in Canada remains about the same. It is of some interest that Heterodera cruciferae Franklin, 1945, has been reported from the United States.

The root-lesion nematodes of the genus Pratylenchus show increasing evidence of being important crop pests in Canada as well as in other countries. Our findings to date indicate that there are at least four or five of these species present in this country. Pratylenchus penetrans Cobb, 1917, has been the species most frequently encountered and Pratylenchus pratensis (deMan, 1880), is not uncommon. All the nematodes of this genus are very small and may be easily overlooked by anyone not well acquainted with them. Accurate determination of the species involved is sometimes difficult, and the difficulty is not lessened by the fact that in most cases host preferences are not at all sharply defined. In addition, there is some evidence of the presence of some undescribed species.

The reported occurrence of the potato-rot nematode, Ditylenchus destructor Thorne, 1945, in Wisconsin has tended to focus renewed attention on this pest. On the other hand, apprehension of this species has declined to some degree as our knowledge of the pest has increased. For example, it is now recognized that potato cropping greatly reduces the populations. Meanwhile there are some important questions to which we do not yet have clear answers. The range of characters in the populations in potato varies to a rather remarkable degree. Some of these variations extend beyond the limits indicated for D. destructor. One possible explanation is that a complex of species may exist. Another is that the range of characters of this species may be much greater than the original description indicated. If only one species is involved, the original description will have to be considerably amended. To name and describe the forms differing most widely from destructor as new apecies would not be

sufficient or very helpful until these forms have been isolated and propagated. To do this it is necessary to build up populations from single females. This type of work is being pursued at the Ottawa Laboratory, and has been greatly helped by our finding that these nematodes are fungus feeders. (Baker, A.D., Georgiana L. Brown and Audrey B. James. Science 119:92-93. 1954). Isolation, propagation, and study is a rather lengthy undertaking, and, though the species question is not yet clear, preliminary observations indicate that at least some of the taxonomic characters used to separate destructor from dipsaci fluctuate widely within pure populations. An answer to this important problem is necessary before final conclusions are made on mass transfers of these nematodes from one plant to another. However, until we have clear evidence to the contrary, it appears expedient to assume tentatively that only one species is involved, but such reporting should be adequately qualified until clear answers have been obtained.

A root-knot nematode, Meloidogyne hapla Chitwood, 1949, was identified from sugar beets near Sarnia, Ont., by Miss G.L. Brown. It was also collected from the roots of tomato at Ste. Genevieve, Que. Further records of root-knot nematodes are reported in The Canadian Insect Pest Review 31(7).

Three items of some additional interest were the collection and identification by Dr. S.A. Sher of Tylenchorhynchus claytoni Steiner, 1937, from soil around red clover at Ottawa, of Pratylenchus sp. from chrysanthemum at St. Catharines, Ont., and of Trichodorus sp. from soil around red clover at Ottawa. Anguina agrostis (Steinbuch, 1799) Filipjev, 1946, was reported by V.E. Henderson from Prince Edward Island attacking Agrostis alba L.

Phenological Data - 1953

The season opened somewhat earlier than usual at Winnipeg but cool weather in mid-May retarded growth and from then on to the end of June the plants observed came into flower a little later than usual. Wheat sown moderately early developed slowly during the latter part of the season and ripened quite late.

At Saskatoon the season opened rather late and the development of native plants and of wheat was somewhat retarded throughout the season.

Recorded dates of flowering at Edmonton fluctuated from early to late during the season and wheat sown nearly a week late was ripe slightly earlier than the normal date for maturity (R.C. Russell).

Throughout the spring and summer the first flowering dates for the majority of plants recorded at Ottawa were from 4 to 11 days earlier than average. Anthesis dates were as follows:

Acer saccharinum	30/3	11E	Bromus inermis	17/6	2E
Populus tremuloides	5/4	10E	Sambucus nigra	13/6	4E
Ulmus americana	13/4	6E	Rhus typhina	18/6	6E
Acer negundo	30/4	1L	Catalpa speciosa	6/7	7L
Acer saccharum	5/5	4E	Phleum pratense	23/6	2E
Prunus pensylvanica	10/5	3E	Tilia americana	6/7	N
Smilacina stellata	15/5	5E	Cephalanthus occidentalis	12/7	5E
Pinus sylvestris	21/5	7E	Solidago canadensis	5/8	4L
Anemone canadensis	27/5	6E	Cassia hebecarpa	27/7	6E
Carya cordiformis	10/6	3E	Hamamelis virginiana	4/9	19E

(I.J. Bassett)