a seed lot might give poor germination even where only a few tubers were visibly affected. Curly top (virus) was believed to have affected scattered potato plants in the Okanagan valley, B.C. The disease has been known on tomatoes and some other plants for a long time, but it has not been previously recorded on potato. In a separate section of the report are recorded the viruses that have been isolated by Mr. D.J. MacLeod from various potato varieties being grown in Canada.

Tobacco streak, which was found for the first time in 1938, was observed this year in both Ontario and Quebec. Downy mildew or blue mould appeared for the second consecutive year and apparently overwintered for it appeared first on seedbeds where it was present in 1938. Phytophthora Rot (P. Cactorum) occurred on the fruit of tomato in several greenhouses in Ontario; it was also observed in 1935, but not reported to the Survey. Phoma rot (P. destructiva) was reported for the first time as a destructive rot in a field in Ontario. A Typhula rot, which has been known for several years in pit-stored turnips in B.C., has been ascribed to a new species, T. umbrina.

Possibly the most significant development in the fruit disease situation is the discovery of several new diseases of cherries and plums. Some of these are of a virus nature, others appear to be physiological, and several remain to be investigated. Some interesting evidence is presented on the fluctuation of peach yellows and little peach with the rise and fall of the vector population.

No new diseases of particular interest were reported on trees or ornamentals.

The Weather and Its Influence on Plant Disease

In the Coastal regions of British Columbia, winter damage to fruit trees, strawberry plants, and berry canes was negligible. In May, however, late frosts did considerable damage to the strawberry blossoms in the Fraser Valley areas and to the current season canes of loganberries and blackberries in some plantings on Vancouver Island. The months of March and April were comparatively dry but precipitation for May, June, and July was well above the average.

Seeding was completed in good time and the yield of fodder crops, grains, and vegetables was better in most districts than in 1938. The strawberry crop was damaged by rain in June, reducing both quality and yield. This was the only major crop adversely affected to a marked degree by the weather.

Fungus diseases on the foliage of field and fruit crops were more general than in 1938, but damage was not unusually great. The season was favourable for the spread of the downy mildew of the hops in summer, but this disease was checked during the dry weather later in the season and excellent crops were harvested. Late blight of potatoes was general in the crops of the Fraser Valley towards the end of the season where no spraying was done although precipitation was considerably less than in 1938.

In the Okanagan valley, the season was characterized by an exceptionally wet June and this was in part responsible for the severity of several diseases especially those on vegetables. It is thought that the severe outbreak of bacterial blight on bean was due chiefly to this factor. July and August were very dry and in some cases orchards suffered severely from wilting. This will no doubt affect next year's crop and may predispose the trees to winter injury.

Extremes of temperature and moisture characterized the 1939 crop season in Alberta. Seeding and germination were delayed in some districts by the general drought and high winds which prevailed until late in May. During June, heavy rains fell in all parts of the province except the Peace River district, and the weather was generally cold. This resulted in retarded growth, especially in west central Alberta and other areas where the rainfall was excessive. Although growth was slow under these cool, wet conditions tillering of the cereal crops was greatly stimulated, and by early July the prospects of an exceptionally heavy crop were excellent. Under these conditions, browning root rot of cereals was unusually prevalent and severe in certain areas, but many of the affected crops later made a fair to good recovery. An extremely hot, dry period started during the second week of July and lasted until about the middle of August. As a result, the growth of wheat and other crops was very seriously reduced. This general deterioration of crops was halted by cooler weather during the latter part of August. Frosts, severe enough to kill potato vines, did not occur, except in isolated localities, until September, and little crop damage from this factor was reported. Conditions were unfavourable for the spread of stem rust and most foliage diseases.

The Peace River district suffered from severe drought until about July 15, but after that received sufficient rainfall to produce an average crop. Consequently, the disease situation was quite different from that of the remainder of the province. Powdery mildew and white tip damage of wheat were very prevalent, and root rots of wheat and oats caused severe damage in many fields. Certain foliage diseases were also relatively abundant.

Seeding began in Saskatchewan about April 15 in the drier regions of the south; it was general by May 1, and was completed by May 15, except in northern Saskatchewan, where the land was too wet for seeding until after May 1. Soil moisture was fair to good, with low reserves in some areas, and excess in others. Weather was cool in April, but became considerably warmer in May. Some severe soil drifting occurred during the second week in May. Rains were infrequent during this period. Fair to good rains in the third week of May repaired damage to blown crops and growth was rapid except in the south-eastern area where it continued dry. During June, bountiful rains fell over nearly all but the southeastern portion of the province. The weather was cool and growth slow. July was hot and dry over most of the province. Rapid growth took place, but deterioration soon set in in the drier areas. The hot dry weather probably limited the amount of stem rust to a light and scattered infection, except in an area around Cabri, where up to 60 per cent infection occurred on the susceptible varieties. August remained dry. The increased rainfall in June seemed to affect the amount of leaf, stem and head spotting this year. Some lodging was evident in heavy crops where discoloration of the

basal parts seemed to be associated with the trouble. The increase in moisture this season came too late to increase the amount of smut. Some frost occurred about August 20 in the Lucky Lake area, but no serious injury was reported.

Observations on weather conditions in Manitoba and in eastern Ontario will be found in the discussions of stem rust of wheat and oats (pp. 1 et seq.).

Spring was late throughout Quebec and at the end of April the ground was still covered with snow in certain localities. Little winter killing was noticed in meadows and pastures. Seeding was considerably delayed, due to the dry and cool weather during May. This is particularly true for eastern Quebec where total precipitation during May varied from 0.78-2.21" depending on the district, while precipitation in the northern sections of the Province varied between 4.01" and 4.93".

June was wet; there was almost twice as much rain this year as last. Precipitation was lighter in eastern Quebec than in the weatern part of the Province. Apple scab was first noticed at Ste. Anne de la Pocatiere on June 30, while in the districts of Montreal and Sherbrooke the disease was reported about the 10th of June. Ascospore liberations were more abundant than last year due to more frequent rains. At the end of the month the various crops had made rapid and luxuriant growth except around Montreal where hay and grain suffered from drought. Late frosts were reported on the 18th of June from Lake St. John district and from Beauceville. The tobacco crop in Joliette county suffered considerable damage from a strong wind that blew over the district about June 10.

In July and August precipitation was heavier in eastern than in western Quebec. In eastern Quebec total precipitation varied, according to districts, between 4.35" and 6.50" in July and 3.98" and 5.64" in August, while the mean for the Province was 4.90" in July and 4.18" in August. On account of frequent rains, apple scab was difficult to keep under control in sprayed orchards. In neglected orchards the season was not far advanced when all the crop became affected. Fire blight spread very rapidly near Quebec City during these two summer months. Splashing rains contributed to a very large extent, to the spread of the disease over entire trees. Late blight of potatoes was first reported in the districts of Montreal and Lake St. John towards the end of July, after a moderate rain that followed a ten day period of drought. In several localities frequent rains and strong wind storms beat down entire grain fields and caused some damage. Throughout the Province harvesting was made difficult on account of rain; hay and grain remained for days and sometimes weeks out in the fields after being cut, before they could be taken in. In many places, crops were seriously threatened by excessive rains and it is not until late in October when they were taken under shelter. Several reports were received in which it was stated that stooked grain was germinating. In Joliette and Montcalm counties, a few hundred acres of pipe and cigar tobacco were flooded during the first part of August, thus delaying harvest for more than a week. Several growers in that same district suffered about 20% loss due to hail and wind storms.

During September, late blight of potatoes caused considerable damage to growers. In eastern Quebec the disease was not observed until the last days of August, but within two weeks, it completely destroyed the foliage in unsprayed fields and severely attacked the tubers. The first killing frost was recorded at Ste. Anne de la Pocatiere on Sept. 25, four days earlier than last year.

Winter conditions in New Brunswick set in later than in the previous year. The ground froze and thawed a number of times in November, and froze up for the winter on December 14. Fourteen inches of snow fell on November 25, but frequent rains thereafter left only a light covering of snow on the ground at the end of December. During January light snowfalls occurred, usually followed by rain, so that by February 15 only a thin layer of ice remained on the fields. Snow fell again on February 19, covering the ground until March 1, when it was removed by rain. The ground remained bare until March 13, at which date 10 inches of snow fell, but this was removed by a rain on March 16. Snow again fell on March 20, and light snowfalls were experienced until April 18. Rain removed the snow on April 20, on which date the river began to rise and the ice moved out of the St. John April 26. Frost came out of the ground slowly until May 8, when a rainfall greatly speeded up the process. The last two weeks of May were cool and dry and most favourable for farm operations and seeding.

Much winter injury to hay fields, especially newly seeded areas, was reported. Strawberry and raspberry plants also suffered severely from winter injury. June was cold and growth was slow, all crops being nearly two weeks late at the end of the month. The early part of July was warm with abundant rainfall and all crops made good growth. However, dry weather set in July 20 and from that date until August 31, only about 1 inch of rain fell in the central and southern parts of the province. In these sections the fertilizer and soil nutrients were rendered unavailable by the drought, and the early maturation of grain crops and potatoes resulted. The dry weather caused great damage to lawns, pastures and gardens. In the northern part of the province very heavy rainfalls were experienced during this period, in some cases causing great damage to fields through erosion. In this section a destructive outbreak of late blight of potatoes occurred. Much brown heart of turnips and internal cork of apples were reported in the drought striken areas of the province. Crown rust was first found on oats on July 24, and stem rust was first reported July 28. Abundant rainfall in September and the early part of October revived the grass stands in lawns and pastures. The weather was particularly favourable during the latter end of October for the harvesting of the potato crop.

The autumn of 1938 in Nova Scotia was favourable to a normal maturity of tree wood and most perennials were well hardened off before winter set in. The winter generally was quite favourable until towards spring when snow coverage became thin and intermittent freezing and thawing occurred and caused damage to unprotected perennials and particularly strawberries. The spring seeding and orchard spraying operations were delayed by cold, damp weather except on the lighter types of soil.

The summer was dry in contrast to that of 1938. The rainfall in June, July, August and September 1938 totalled 19.86 inches. In 1939 the rainfall for the same period was 8.25 inches compared to a 20-year mean of 12.34 inches.

Drought conditions affected many apple orchards. Fruit was small, leaves wilted, and many trees suffered premature defoliation. Drought spot and corky core were more conspicuous in apples than for several years. Deficiency diseases of root crops were more frequently observed and crop yields were considerably reduced in early harvested areas.

Despite an abundance of snow during the latter part of the winter, and generally higher temperatures than the previous year, considerable winter killing of plants occurred in Prince Edward Island. This was particularly true of clover where losses were severe, the damage being attributed to alternate freezing and thawing during April and early May. Average temperatures for May were lower than 1938, and during the last two weeks of the month considerable rain fell, with the result that the planting was held up in some sections of the province. Spores of the brown rot fungus were plentiful before blossom time but dry weather in June prevented this disease from becoming severe.

June was fairly cool and for the most part, dry, only 1.18 inches of rain being recorded during the month. A slight discharge of apple scab spores was noted June 4 and a heavy discharge June 14 when apples were in full bloom.

July and August of the past summer were unusually clear, hot and dry. It is worthy of note that there were 118.4 hours more sunshine during the combined months for 1939 than in 1938, and during August rain fell on four days only. As a result of this, some crops suffered slightly from drought, but diseases were practically negligible. Infections of crown rust of oats, and leaf and stem rust of barley and wheat were seldom more than slight. Late blight also, was checked and no outbreak was recorded before the end of August.

September and October were cool; a heavy killing frost being recorded on September 24, and the latter month, during which 8.80 inches of rain fell, was particularly wet. A few potatoes were damaged in the ground by early frost but the majority of the crop had been dug or escaped serious injury.

Common scab of potatoes was more severe than usual in this province during the past year, the unusually dry weather in August and early September, undoubtedly being a factor. Check plots in a scab test at the Laboratory of Plant Pathology were one hundred per cent infected, ninety-five per cent of which was classed as severe. Slight outbreaks of late blight were found in a few fields of potatoes September 12, but the plants were already nearly matured and no decrease in yield was expected. Tuber rot was also reported as negligible throughout the province.