The Weather and Its Influence on Disease

On Vancouver Island, as elsewhere in B.C , spring temperatures were below normal. The low temperatures prevaled from April to June and precipitation during June and July was 3.29 in. compared to the normal precipitation of 1.35 in. As a result late blight developed early and spread rapidly in many fields. However, most growers maintained their applications of fungicides and with fine weather prevailing during August and early September damage from late blight was confined to some reduction in yield in fields early defoliated by late blight (N. Mayers).

The winter of 1954-55 on the lower mainland of B.C. was fairly normal with the mean temperatures somewhat higher than usual. However, mean temperatures for April and May were 2.8° and 3.3°F. below normal, respectively, both being record lows. Low temperatures continued throughout the summer, which was generally cool and wet.

Planting of potatoes was late and the early crop was marketed 2-3 weeks later than usual. The small fruit crops were late in ripening and there was substantial loss from grey mold (Botrytis cinerea) in strawberry, raspberry and also in pole bean. Late blight of potatoes was much in evidence on the foliage by mid-July and caused considerable loss in the early crop. However, where the recommended spray program was followed, loss from tuber infection was not serious in the main crop.

August was fairly dry with only .11 in. rain.

There was a heavy freeze (7°F. in the Abbotsford fruit growing area) in mid-November (11-18 Nov.), which caused serious losses to late vegetables, complete loss of sheltered chrysanthemum flowers, and serious injury to small fruits and nursery plantings (H.N.W. Toms).

The 1954-55 winter might be termed a "normal winter" for the Okanagan Valley. There were several weeks of cold weather, but no excessively low temperatures. Snowfall was average.

Weather during the spring and early summer was abnormally cold. The months of July and August provided normal summer temperatures. Fall weather was mild until 11 Nov., when the temperature suddenly dropped 33° in 20 hours, to 4°F. A minimum temperature of -2°F. was recorded several days later. The total number of degree-hours of heat (above 50°F.), computed by Dr. D.V. Fisher of the Experimental Farm, Summerland, was 45,200, close to the average for the years 1946-1955, and 10,000 degree-hours higher than for 1954.

Blossom time for all tree fruits was between two and three weeks later than average. Picking season for cherries was three weeks late, for apples about ten days late. However, the apple crop was harvested before the temperature drop on 11 Nov.

Vegetable crops were also late. Incidence of onion mildew was unusually low, possibly because of well-timed drying winds.

During the spring and early summer there were no wet periods long enough to permit apple scab infections. This disease was practically absent in the Okanagan Valley whereas in the three previous seasons severe losses had been suffered.

The full amount of damage caused to fruit trees by the sudden temperature drop in November cannot be assessed until the spring of 1956. However, it occurred when many apple trees still bore a heavy covering of green leaves. Injury is evident in a small percentage of the buds of apple, peach, plum, and apricot. Browning or blackening of fruit spurs is common in apple, cherry, pear and plum. Bark splitting and browning of tissues are common in the trunks and crotches of cherry. In Okanagan districts north of Summerland the extent of injury is reported to be considerably greater.

The weather pattern for the Kootenays was similar to that for the Okanagan, except that there were longer wet periods in spring and summer months. These periods, perhaps augmented by the effects of heavy dew, resulted in severe outbreaks of apple scab and brown rot of stone fruits (M. F. Welsh).

In southern Alta. the winter was relatively mild and very little winter injury or snow mold damage occurred in forage crops or winter wheat. During the wet, cold spring, seedling blight was very evident in pea fields, but no more damage than usual occurred in sugar beets. Usually humid, warm weather during mid-July apparently favored the rapid development of several leaf and stem diseases of cereals and other crops. The balance of the season, however, was dry and most of these diseases caused little or no damage. Bacterial wilt of alfalfa was more severe than in 1954, probably owing to the abundant soil moisture early in the season (J. T. Slykhuis).

In central Alta., April 1955 was the wettest April on record, about 30 in. of snow and 0.5 in. of rain falling between the 18th and 29th. Before the land could be worked it had lost this valuable moisture and seeding dates were quite late. No further appreciable amount of rain fell until the end of June. July was very hot and dry with good rains in the last week. This was followed by a dry August. The Peace River district was very dry all summer and many crops were scarcely worth cutting. The dry conditions seemed to favor northern anthracnose of red clover and black stem of alfalfa, both being unusually prevalent in the Peace River area. Common root rot of cereals and take-all of wheat were less prevalent than usual (W.P. Campbell).

Heavy rainfall caused flooding during April and early May in many parts of Sask. Seeding was seriously delayed and a great deal of arable land was not seeded. The weather cleared during May, seeding was completed rapidly and growing conditions were good. There was steady growth and the crop, in spite of late seeding, was well advanced by 15 July. High temperatures in July favored early ripening of a healthy, bountiful crop. Rust appeared about a month later than in 1954 and did not develop to any extent in the dry, warm weather. Abundant soil moisture and vigorous growing conditions offset

damage by root rots. The season favored the development of ergot in grasses and on the margins of fields in cereal crops. In spite of dry days and almost dewless nights during August, stem and crown rust developed rapidly on late oats and caused considerable damage. The early crops were harvested under ideal conditions and the quality of the grain was excellent (H. W. Mead).

Stem and leaf rust were first observed on wheat in Man. on 13 June. Temperatures and precipitation favored rust development until 15 July and stem rust became well established on susceptible varieties in Man. and Sask. However a considerable acreage, particularly in Man., was sown to the stem rust resistant variety Selkirk. Also in the latter part of the season hot dry weather greatly hastened crop ripening and retarded rust development (B. Peturson).

In s.w. Ont. the summer was extremely hot and the temperatures only dropped for short periods following a few well-spaced rains in Essex and Kent counties. Serious boron deficiency symptoms in the table beet appeared in two large fields at Chatham where it was considered that the disorder was brought on by high temperatures which reduced the available boron in the soil below minimum requirements of the plant. Early blight (Alternaria solani) was much more prevalent than usual in the canning tomato crop. Also, Stemphylium solani, a fungus causing gray leaf spot of tomatoes, was found in mixed infections with A. solani. S. solani is usually prevalent on tomato crops in the southern States but hitherto has not been found in Ont. (C.D. McKeen).

In the Niagara Peninsula, the season opened extremely early. As a result some growers who have depended on a spring application of a dormant spray to control peach leaf curl failed to spray their trees in time. Others had not adequately protected the twig growth. The cool weather favored infection and there resulted the worst epidemic of leaf curl in many years.

The brown rot fungus caused little blossom blight during the early, short bloom period when the weather was fair and warm. Also sweet cherries were harvested almost free of brown rot. However the warm weather hastened the ripening of the early peaches with the result that markets became glutted and wastage from brown rot became serious before the fruit reached the consumer. Early in August the prolonged heat and drought was broken by hurricane Connie and the frequent rains that followed. Rain, hail and wind damaged varieties approaching maturity, caused many minute skin punctures and bruises, which served as infection courts for brown rot. The driving rains also favored an outbreak of bacterial leaf spot. Although there were four well-marked infection periods in late April and in May, apple scab was not difficult to control (G. C. Chamberlain).

In s.w. Que. weather conditions were in general unfavorable for development of plant diseases. Rainfall was below and temperature above normal. These warm and dry conditions did not favor apple scab and late blight

of potato, two diseases that are usually prevalent. These conditions, however, favored the development of physiologic disorders such as blossom-end rot of tomato (L. Cinq-Mars).

Spring started about 20 April on the south shore of the St. Lawrence in Que. Precipitation and temperature were favorable to plant growth. Soil and air warmed up slowly and steadily unlike in the previous year. Crops were seeded between 15 May and 10 June. Summer began in mid-June and ended around 10 Sept. Early summer was excessively dry and this condition affected considerably the development of vegetables and fruits. The drought, which was very severe in certain parts of the country, lasted about 20 days along the lower St. Lawrence. It was followed by a period of moderate rain showers occurring quite regularly but never sufficient to satisfy crop requirements. Air temperature during the same period remained above average and July and early August were hot. These weather conditions are likely responsible for the late appearance of diseases last summer. Precipitation increased toward the end of July and disease development was somewhat favored. In early August, bacterial blight and anthracnose of beans and Verticillium wilt of raspberry were observed. In mid-August, cucumber scab was recorded at Ste. Anne de la Pocatiere. About the same time a low percentage of blossom-end rot of tomato was noted. Apple scab was extremely sev. in orchards not regularly sprayed. The McIntosh variety was most sev. infected. Red and black currants were sev. rusted. Traces of few other diseases, such as anthracnose and bacterial blight of beans, fire blight of apple and blight of willow, were observed in Montmagny and L'Islet counties. Traces of early blight were found on tomato at Charny, in Levis county, toward the end of August. Around 1 Sept. air temperature dropped below normal, but as the water supply did not increase, disease development on vegetables, fruits and ornamentals was not much favored. Ascochyta diseases on peas were observed in small amounts here and there throughout the district. In a nursery, rust was abundant on hybrid perpetual roses, powdery mildew on hybrid perpetuals and polyanthas and black spot on hybrid tea, polyanthas and perpetual roses. In St. Jean Port Joli, a few ornamental oaks (Q. borealis) were found to be infected by Taphrina. By 20 Sept. late blight was found on tomato at Ste. Anne and vicinity and in a few cases anthracnose developed on stored fruits (L. J. Coulombe).

The first quarter of 1955 was characterized by an extremely heavy snowfall of almost 100 inches at Fredericton, N.B. Also 16 days were below 0°F. However, because of the snow coverage, the ground remained frost-free all winter. During the winter apple trees not adequately protected against mice suffered considerably from girdling.

The snow melted gradually in late March and by early April had entirely disappeared. Little, or no, flooding occurred.

Planting began early in May during a period of warm, dry weather, but it was interrupted after mid-May by frequent showers until 10 June. During this 3-week period the weather was somewhat favorable for apple scab infection. The first ascospore discharge occurred on 26 May when McIntosh bloom was at the full pink stage.

A very good hay and clover crop was harvested without difficulty during the latter part of July and the month of August. The hot, dry weather of August and early September was unfavorable to grain crops, especially barley.

The three months, September to November, were the driest on record and farmers faced the winter season with a grave water shortage.

The ground froze to a depth of 7-8 in. in November despite a snowfall of 7 in. (J. L. Howatt).

The winter of 1954-55 was milder than usual with mean temperatures for December, January and February at Kentville, N.S., from 5° to 7° above the 40-year average. Total precipitation was normal but a greater proportion than usual fell as rain. Temperatures during April and May approached the 40-year mean but the precipitation for these months was 3.71 in. compared to a mean of 5.56.

From June to September inclusive, the mean temperature for July was 4° above normal and for August over 1°. At the same time precipitation was distinctly less, particularly in June and July when the monthly means were 1.55 in. compared to 2.87 in. for the 40-year period.

The deficit in rainfall was apparent in the decreased prevalence of many diseases during the early summer. Later in the season the leaf spot and fruit rot diseases did appear to some extent (J. F. Hockey).

The weather at Charlottetown, P.E.I. in 1955 remained near the 46-year average except for a record low of 39.2 hours of sunshine in January.

Ascopores of apple scab fungus were discharged on 9 occasions at Charlottetown between 30 May and 16 June. An appreciable discharge took place during two periods, 31 May-2 June and 7 June. Trace discharges took place on seven other days. Infection was noticed on leaves of unsprayed trees on 19 June; the previous 18 days were marked by dull, unsettled weather accompanied by frequent showers and cool nights. Within a week leaves and twigs of unsprayed trees were sev. infected and considerable leaf drop followed.

As a result of the backward June weather late-sown cereals showed poor growth and considerable chlorosis. This condition was attributed to the lack of nitrogen. Late blight of potato was not recorded until 1 August. The weather was not conducive to its spread and consequently it did not become a serious problem. Early blight, however, caused sev. defoliation in a few potato fields (J. E. Campbell).

The spring of 1955 was very wet in Nfld. as the total precipitation was 29.56 in. compared to the normal of 13.85 in. During March and April, 99.8 in. of snow fell and May and June brought 14.05 in. of precipitation as compared with the normal of 7.47 in. Precipitation was normal (3.49 in.) in July, and a little below normal in August and September, but during October and November precipitation records were again broken when 8.23 and 12.59 in. respectively were recorded compared to the normal 5.58 and 5.70 in. From March to November, a total of 58.74 in. of precipitation were recorded whereas the normal total for the same period is 41.05 in.

Seeding was late in Nfld. on account of inclement weather and not until July were many farmers able to work their land. Many of the farmers who planted potato, carrot, beet and parsnip seed in early June were forced to re-seed their land in July as the seed had decayed. Late planting and early frost caused potato tubers to be small and yield was greatly reduced.

Weather conditions were ideal for the spread and increase of many plant pathogens, particularly those causing soft rot, late blight and potato wart (G. C. Morgan).

Notes on Some Nematodes in Canada, 1955

A. D. Baker

Nematode Investigations Section, Entomology Laboratory, Ottawa

The sugar-beet nematode, Heterodera schachtii Schmidt, 1871, was not found outside the areas previously reported in Ontario. On the other hand, the oat-cyst nematode, Heterodera avenae (Lind, Rostrup & Ravn, 1913) Filipjev, 1934, was found attacking oats at Tupperville, Ont. Previously this species had not been found west of the Waterloo area. There is no record of the golden nematode, Heterodera rostochiensis (Wollenweber, 1923) Franklin, 1940, in Canada.

Root-knot nematodes, Meloidogyne spp., were intercepted by officers of the Plant Protection Division on strawberry roots from Rockford, Ill., and from Beltsville, Md., U.S.A., and the southern root-knot nematode, Meloidogyne incognita Chitwood, 1949, on chamaeranthemum roots from Florida. The northern root-knot nematode, Meloidogyne hapla Chitwood, 1949, was recorded from shasta daisy roots from a nursery at Port Burwell, Ont., was numerous on strawberry roots from Kentville, N.S., and caused heavy galling of carrots from near Chatham, Ont.

Of the spiral nematodes, Rotylenchus robustus (deMan, 1880)Filipjev, 1934, was found in strawberry soil at Ottawa and at Fredericton, N.B. It was found in wheat soil from Lake Lenore, Sask., in buckwheat soil from Fallowfield, Ont., and in very large numbers around oat roots from Wyman, Que. Rotylenchus erythrinae (Zimmermann, 1904) Goodey, 1940, was found around the roots of Agrostis sp. from Hepburn, Sask., around white clover roots from Pierce's Corners, Ont., around wheat roots from Lake Lenore, Sask., around flax roots from Cardston, Alta., around alfalfa roots from Shawville, Que., around red clover roots from Hazeldean, Ont., and Macdonald College, Que., in oat soil from Tupperville, Ont., and from Wyman, Que., and from soil around a tamarack tree at Pierce's Corners, Ont. A fairly heavy infestation of Hoplolaimus coronatus Cobb, 1923, was found in pasture sod from Brandon, Man.