The Weather and its Influence on Plant Diseases

On the lower mainland of B.C. the weather in 1947 was generally favourable for growth and harvest. The winter was more severe than usual. A near-record low for Vancouver of 4.8°F. occurred in January, but this did little damage other than to a few ornamental plants. The spring was early. Record highs of 75°F. and 83°F. occurred in April and May respectively, and there was reputed to be some loss in strawberry tonnage due to continued dry, hot weather in June (R.E. Fitzpatrick).

There were few abnormalities in the weather of the Okanagan Valley. Scab was severe in the Kamloops district, but very light at Salmon Arm. Downy mildew of onion appeared in the Kelowna area but was checked abruptly by hot, dry weather (H.R. Mclarty).

In southern Alta., severe winter conditions caused extensive killing of winter wheat and alfalfa. Many other plants were apparently predisposed to attack by soil-borne pathogens. Damage to winter wheat was so severe in the Coutts-Foremost district that all fields were reseeded to spring wheat. In central and northern Alta., winter conditions were generally favourable for crop plants and there was not an unusual amount of snow mould or winter crown rot damage in grasses and legumes. However, root-rot damage was unusually severe in several fields of winter wheat in one area of the Peace River district, where the plants were possibly weakened by dry conditions in late fall and early spring. A cold, wet spring delayed seeding in most districts, but it was followed by dry weather, which prevailed in most areas until the end of July and caused serious deterioration of crops, particularly in the southeast. Although the drought delayed the incidence of many of the foliage and stem diseases, conditions later in the season were more favourable and considerable infection developed. Hail and frost damage were severe in some districts. Harvesting was delayed by continuous rains starting in late August, which resulted in serious reduction in yield and grade (M.W. Cormack).

At Saskatoon, Sask., rainfall was below normal in May, June and July, but above normal in August and September. Temperature was low in May and September, normal in June, and high in July and August. Sunshine was high in all months but June, the figure for July being a record. For the season as a whole, rainfall was normal or above in only the southeastern part of the province. A late spring delayed seeding and germination, encouraging weed growth. Low soil temperatures also favoured bunt of wheat. Heavy frosts in late May severely damaged fall rye, barley, oats and wheat, and greatly reduced the yield of wild fruits such as Amelanchier. A prolonged drought checked foliage diseases in most areas, but moister conditions in the east and southeast areas stimulated such diseases as leaf rust, speckled leaf blotch and bunt of wheat. Dry, hot weather in the northern alfalfa area checked black stem and encouraged bee activity. A heavy crop of seed was harvested. The drought favoured common root rot of cereals (H.W. Mead, T.C. Vanterpool).

Winter conditions were favourable for orchard fruits in the Niagara Peninsula, Ont., except for subcooled rain in late December and early January, which sheathed branches in ice and encouraged rabbit injury of young trees.

Frequent rain in April hindered timely application of dormant sprays, and leaf curl was epidemic in many peach orchards. Growers who sprayed in late fall or before April obtained excellent control.

Continued wet weather in early May kept orchard soils too wet for cultivation, and the undisturbed mummied peaches produced abundant brown rot apothecia 7-12 May. The sweet cherry bloom period at St. Catharines, 12-23 May, was extremely wet and heavy blossom infection occurred. Losses of peaches, plums and sour cherries were less severe, but were also high. Cool, wet weather delayed cherry fruit development and shedding of blossom remnants, and considerable rotting of green fruit resulted.

Carry-over of apple scab was light to moderate. Mature ascospores were seen 30 April and spore discharges occurred 2, 6 and 7 May; but low temperature hindered development. Heavy discharges 17-20 May with temperatures of 60-73° F. favoured primary infection, and a heavy 30-hour rain 1-2 June initiated widespread secondary infection. Further spread occurred 6-8 and 14-15 June. Rain on fifteen days in July kept the disease active, but hot, dry weather in August checked development on the fruit.

Clear, warm weather in late September curbed spread of late blight on tomato (G.C. Chamberlain).

The mean temperature at Ottawa was slightly high in January, low in February, and normal in March. Snowfall was normal in January and February, but was exceptionally heavy in March. Snow cover was abundant throughout the winter. April was very cool with high rain and snowfall. The ground was bare by 15 April, but was covered again from the 16th to 20th. Cool, wet weather with little sunshine persisted through May, June and early July. After a winter with 122 in. snow and high rainfall, these conditions made the drying out of low ground impossible, and the Ottawa River remained within a few inches of the record flood stage for two months. Nitrifying bacteria were suppressed in many fields and corn was markedly stunted. From mid July to the end of August the weather was warm and very dry, and the abrupt change caused considerable drought injury. Downy mildews, *Phytophthora* spp., *Botrytis* spp., and some anthracnoses were stimulated by the weather of May and June, but conditions were apparently too wet for the optimum development of some rusts. September was wet, October very warm and dry, November close to normal, and December cold and dry. A light snow cover persisted after 24 Nov. (D.B.O. Savile).

In eastern Quebec, a cold, rainy spring delayed the development of both plants and plant pathogens. The summer was warm, dry and rather short, from about 20 June to 20 Sept., but most cultivated plants reached maturity. The incidence of most diseases was low. Early in the summer

Pseudomonas syringae was abundant on lilac at Ste. Anne de la Pocatiere, for the first time since 1936. Rathay's disease of orchard grass was more widespread than in 1946, but dry weather killed the affected plants by the end of June.

Puccinia graminis and P. coronata were scarce on barberry and buckthorn, making heavy primary infections impossible. Light rains in mid August favoured development of cereal rusts, but too late for appreciable damage. Puccinia Ptarmicae was epidemic on Achillea Ptarmica where the weather was dry and hot, but infection was very slight in the moister places.

There were only isolated outbreaks of potato late blight. Pink rot (Phytophthora erythroseptica) of potato caused some concern in the plots of the Station and of the Laboratory at Ste. Anne. Infection appeared to have spread from one field to the other through ground water (A. Payette).

March was exceptionally open in N.S. with bare ground throughout and conditions favourable for injury to crowns of perennials. The spring and early summer were wet and favoured the development of many pathogens. Apple scab developed to serious proportions. Botrytis blights were common on tulip, peony, Prunus spp., and other plants. Grain seeding and potato planting were held up in many sections by wet soil and were not completed until the end of June.

Late in June, strawberry wilting occurred in many plantings. Much of this appeared to be due to winter injury to the crowns. The summer months were warm and dry although a rain of 2.5 in. in 24 hours made the total July precipitation somewhat above the 30 year average. August brought less than one inch of rain and October 0.4 in., a new low for that month. In September some good rains helped to size and mature the apple crop, but also spread late scab infections on fall and winter varieties.

Several fogs during the summer caused late blight epidemics on potato in coastal areas. A frost on 29 Sept. killed most potato tops and prevented further spread of late blight (J.F. Hockey).

Weather conditions during the year 1947 were abnormal in P.E.I. An unusually light snowfall left the land bare or ice-covered during the winter. Seeding of grain and planting of potatoes were delayed by heavy and prolonged rains in May and June. Apple scab spore discharge became general and heavy during early June, but carefully time spray applications prevented infection, which was heavy in unsprayed orchards and on wild trees. July and August were unusually dry. This factor, coupled with the highest mean temperature ever recorded for July, alleviated the threat of potato late blight and arrested development of stem rust, which did not develop until late in the season. Potato magnesium deficiency and turnip brown heart were more severe than in recent years because soil moisture was insufficient to make available the supplements in chemical fertilizers. The considerable amount of potato common scab in 1947 indicated a response of the pathogen to the hot, dry weather. Powdery scab and rhizoctonia, being wet season diseases, were of little consequence. Downy mildews were insignificant.

Rainfall of 4.72 in. in September brought on an incipient fall attack of late blight, which caused some injury to the stored potato crop. Between 24 and 29 Sept. frosts killed off most of the potato tops, making chemical killing unnecessary. Sharp frosts during the digging period caused some injury to potatoes left on the ground at night (R.R. Hurst).

Phenological Data - 1947

The data in the main table were compiled by B. Peturson at Winnipeg, R.C. Russell at Saskatoon, and M.W. Cormack at Edmonton. The second column under each locality shows the departure, in days, from the average time of flowering.

The first part of the 1947 season was late at all three places but especially so at Winnipeg. Dry weather tended to hasten the maturing of plants later on at Saskatoon and Edmonton and, judging by the records for wheat, the same situation developed at Winnipeg. Wheat was sown early at Saskatoon and, after lagging for some time in the early stages of growth, ripened early because of lack of moisture in June and July. At Edmonton, where moisture conditions were more favourable, wheat ripened slightly after the average date of harvesting (R.C. Russell).

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

Populus tremuloides	26/4	10L	Anemone canadensis	12/6	7L
Acer Negundo	12/5	14L	Bromus inermis	28/6	8L
Prunus pennsylvanica	27/5	13L	Phleum pratense	29/6	4L
Smilacina stellata	30/5	10L	Solidago canadensis	10/8	11L

Anthesis dates for marker trees at Ottawa compared with previous years:

	Average (1936-45)	1945	1946	1947
Acer saccharinum	14/4	25/3	21/3	12/4
Ulmus americana	27/4	3/4	7/4	6/5
Acer saccharum	8/5	14/4	8/5	19/5
Pinus sylvestris	27/5	27/5	1/6	10/6

The season at Ottawa opened with the flowering of Acer saccharinum two days ahead of average. The season immediately began to lag, however, and by 1 May it was a week or more behind average. A lag of 8 to 12 days persisted throughout the season (W.H. Minshall).