The Weather and its Influence on Plant Disease

The early months of 1963 were cool in coastal British Columbia. A minimum of 14°F was recorded at the seacoast on January 11 and the last frost occurred during the first week in April. Spring rainfall was below average and a cool April and early May delayed the planting of some field crops, After mid-May the temperatures rose and bright sunshine exceeded its long-term average. Rainfall was low and temperatures cool in June.

Temperatures in July continued to be cool and rainfall was in excess, favoring such crops as canning peas but hindering the growth of corn. Late-crop potatoes grew well but a necrosis of pit'h cells in young tubers was observed in late July; subsequent tuber growth resulted in extensive hollow heart in crops grown on heavily fertilized soil. Extensive blackleg infections were noted in potato fields, Bacterial blights of ornamental cherry and lilac were commonly encountered,

Some peculiar effects attributed to the cool temperatures were: abnormal curling and browning of leaves of ornamental dogwood, tuliptree and the native cascara tree; the arrested development of some annuals, including asters and snapdragons, after the formation of flower buds and lateral shoots, resulting in a condition resembling phyllody; the development of chlorotic foliage, accompanied by a red-leaf condition, in oat fields and the production of yellow-green terminal growth in tomatoes.

Late blight appeared in tomato fields in early August but below-average rainfall and normal sunshine prevented its development and spread in adequately sprayed fields, September temperatures were well above average and rainfall below average. The first killing frost occurred at the seacoast on November 10 (H.N.W. Toms).

The winter of 1962-63 was mild and dry in the British Columbia interior. There was snow on the ground only 4 days at Summerland and the total rainfall from November to February was only 55 percent of normal. The mild weather was broken twice, by a 2-day period with minima of -3°F in mid-January and 2 days with zero minima at the end of the same month, The mid-month drop of about 30 degrees resulted in little tree damage but caused bud damage that contributed to light cropping of stone fruits in most districts. The low temperatures had no apparent effect on the overwintering of powdery mildew which was severe in most districts throughout the season.

Rainfall in April was more than 3 times normal, Early apple scab foliage infections occurred during this period and brown rot blossom blight appeared in some orchards. Peach leaf curl was unusually severe. May was dry and unusually hot, providing no apple scab infection periods. June, however, was cool and cloudy and scab infections of fruits were reported from the north and south Okanagan districts as well as from the Kootenays. The recommended spray program was fully effective,

The weather continued cloudy with frequent light rains through July and the first half of August, The sweet cherry crop was reduced approximately 20 per cent by splitting, and brown rot was serious for the first time in many years, Fire blight appeared in early June, and continued to spread through

most of the summer, the worst outbreak since 1948. Peach and apricot growers who ignored recommendations for protective sprays suffered losses from brown rot. Coryneum blight was more serious than usual in apricot and peach. Serious losses from Rhizopus rot in cannery peaches were avoided by the application of fungicidal drenches in packing-houses. September and October were mild, and provided ideal harvesting conditions, except for two short, heavy rainfalls in September. First frost (29°F) occurred October 30, The apple crop was the largest since 1946, and of unusually high quality.

Several virus diseases affecting apple fruits produced very mild symptoms. McIntosh leaf pucker was severe on leaves produced before mid-May, but the accompanying fruit symptoms were mild in some orchards, absent in others, Ring russetting symptoms on Newtown, Delicious, and Golden Delicious fruits were very mild, or absent. This added to accumulating evidence that high heat units in the last half of May, during and immediately after the blossom period, suppress fruit symptoms. Dapple apple symptoms appear to be unaffected by seasonal differences in weather.

Grapes growing on light gravelly soils suffered cold temperature damage to roots, and there was some bud injury, Undamaged vines had good cane growth, and heavy **crops** of large fruits. Ripening conditions were good in late August and September, but bunch rots were fairly common,

Most vegetable Crops, especially tomatoes and corn, matured late because of cool weather in June, July and early August. However, the tomato picking season extended until the end of October, so that total tonnages were high. Early blight was fairly severe in potato and tomato, A bacterial blight, new to the Okanagan Valley, seriously affected some fields of corn, Onion mildew was unusually severe (M. F. Welsh).

A sudden drop in temperature to -30°F in central Alberta in February resulted in a considerable amount of poor foliage and bud drop in cold-sensitive fruit trees, especially plums. The more northerly areas had a dry, warm spring and the southern part of the district had early spring rains and somewhat cooler temperatures. Consequently, foliage diseases of cereals such as scald and netblotch of barley, while practically non-existent in the north, developed to a serious degree in the southern areas,

Summer was characterized by good rainfall and high temperatures, Cereal crops ripened very rapidly after heading, a condition that contributed to an extremely low incidence of stem rust. Bacterial diseases, such as bacterial blight of cereals, black leg of potatoes and fire blight were favored by the warmer-than-usual summer weather. High temperatures and high humidity favored the development of anthracnose on lawn grasses (W.P. Skoropad),

One of the most severe droughts ever recorded in southern Alberta occurred in the spring of 1963, However, rains came in the latter part of June (4.5 inches) and moist conditions continued throughout July and August followed by an unusually warm September and October.

This sequence of weather favored the development of wheat streak mosaic. It encouraged late volunteer growth of wheat and provided an exceptionally long period for the vectors to transmit the virus. Conditions were also favorable for the development of stem and leaf rust of cereals and these diseases also reached epiphytotic proportions in many areas in southern Alberta (J.B. Lebeau).

The crop season of 1963 in Saskatchewan was notable for unusually favorable moisture conditions in most areas. By July 9 rainfall was much above normal in all districts except in some areas in the northeast and northwest, Leaf spots on grasses appeared early and increased rapidly. Leaf rust of wheat was present at Saskatoon very early in July and the almost continuous warm, moist weather favored its spread, By the time the wheat was in head most of the leaves were heavily infected, and were dead when the heads were filling. The abundant moisture also favored lawn diseases of many kinds normally not present. The number and severity of diseases on stems and leaves of legumes also increased over that of other years (B. J, Sallans).

Precipitation from April 1 to June 30, in Manitoba in 1963, was considerably above normal. Frequent rains kept the soil moist and in the Red River Valley and eastern Manitoba it was saturated, From the beginning of July to the end of harvest the precipitation was much below normal with infrequent light showers.

Temperature, on the other hand, was normal from April to June and considerably above normal during July and August, Under these conditions both field and garden crops developed lush and heavy growth with shallow root systems, These conditions also favoured rapid multiplication and spread of plant diseases and pests with the result that crops that indicated heavy yields before the onset of the hot, dry period, matured early or were killed prematurely with disappointing yields (W, J. Cherewick).

The weather of 1963 had a marked effect on certain diseases and non-pathological disorders in crops in southwestern Ontario. The severely cold winter caused much winter injury in peaches in Essex and Kent counties. Mortality was highest in older trees where it ranged from 10 to 80 per cent. Great variations in mortality occurred among orchards, and the variation among varieties was somewhat less pronounced.

In the absence of an aphid infestation a very low incidence of tobacco etch virus in burley tobacco and pepper crops was observed, The cool, dry and late spring season did not favour early-season activity of the aphids.

A low incidence of foliage diseases of many field and orchard crops was correlated with the spring and summer drought, On the other hand, the severe drought incited boron deficiency in sugar beets, Despite the prolonged drought an excellent canning tomato crop was harvested. The long frost-free period in the autumn, together with the absence of precipitation to cause cracking, reduced losses of harvestable fruit (C.D. McKeen).

An extended damp period from May 6-10 provided the only potential infection period for brown rot of stone fruits in the Niagara Peninsula of Ontario in 1963, It resulted in trace infections that were visible on May 13 and 14. Ensuing dry weather prevented the spread of infection and crops of cherries and peaches were virtually free of fruit rot. A heavy frost on May 24-25 caused considerable damage and resulted in generally poor quality cherry crops at harvest. Continued rains in July and August favored heavy infections of bacterial spot of stone fruits in several areas in the Peninsula (J.H. de Ronde),

Dry conditions prevailed in May and June in the lower St. Lawrence district of Quebec and were not favorable for the initiation of apple scab. Some misses, noted in potato fields, were probably due to these conditions. Mean temperatures for July were two degrees above normal; rainfall was also above normal. Green petal of strawberry was much less prevalent than in the previous year but phyllody of clover was more abundant.

Cool and wet conditions in August and September favored the development of loose smut of oats and barley but loose smut of wheat was virtually absent. The prevailing conditions favored the slow development of late blight of potatoes and eventually tuber rot was more prevalent in this than in other areas of the province, Striking symptoms of bacterial ring rot were evident in both foliage and tubers, Early blight was serious on potatoes grown in sandy soils (H, Genereux),

The crop season in New Brunswick was somewhat delayed due to the heavy snowfall of the previous winter. May was relatively cool and wet and conditions in June were normal except for the occurrence of frequent light rains and high humidity at the end of the month. July was hot and dry, followed by an exceptionally rainy August and September when hours of sunshine were at a record low,

Apple scab infections occurred in mid-May and many infection periods took place when it was impossible to move spray machinery in the orchards. Only vigorously applied control measures subsequent to this period kept fruit scab in check. Frequent rains and high humidity at bloom and harvest favored a high incidence of gray mold rot of strawberries which reached serious proportions in all producing areas, Gray mold was also prevalent on crops such as beans, tomatoes, lettuce and potatoes,

The excessive rainfall and high humidities in August and September were favorable to late blight in potato and tomato crops, It reached epidemic proportions in unsprayed or poorly sprayed fields, Bottom rot of lettuce was widespread and soft rot of brussels sprouts occurred in several fields, An early frost in late September severely damaged many crops, particularly beans for processing, tomatoes and late corn (S.R. Colpitts).

The growing season of 1963 was about normal for vegetable production in N.S. The spring was dry and it was necessary to irrigate extensively in late June to maintain strawberry production. The rainfall was in deficit in July but three well-spaced periods of rainfall in August replaced part of the

earlier water deficit, September was normal for rainfall and October was a bright, sunny month that enabled farmers to harvest crops in good condition. A frost early in September caused extensive damage to the tobacco crop and, in some areas, cut off production of tomatoes. Another frost on October 10th did extensive damage to the apple crop in low-lying areas on the floor of the Annapolis Valley

Late blight of tomatoes and potatoes was found on a cull pile on July 11, about the average time for this area. There were a number of very humid periods when it threatened to spread but spraying and the return of good weather checked its development. Carrot leaf blights appeared as usual, but spraying held them in check. There were serious losses from soft rot when affected potatoes were stored. Aster yellows increased over 1962 but did not develop until late in the season and was not destructive to the carrot crop.

Apple scab was not difficult to control when a full spray schedule was carried out. Ascosporea were somewhat later maturing than usual due to a cool, backward April, The first discharge was recorded on May 6, at which time the apple buds were still closed. Buds opened very slowly until about May 23, which was followed by a week of very warm weather. This resulted in full bloom at about the usual time, during the first week in June. The most serious apple scab infection period was on June 6-7, towards the end of bloom, at which time some orchards were not well protected, There were four infection periods in May, four in June and five in July. Some late scab showed up near harvest, particularly on McIntosh and Cortland (R. G. Ross).

In Prince Edward Island, moisture conditions were ideal for plant growth during the entire growing season. A warm July was followed by a relatively cool August so that there was some delay in maturity of tomatoes, corn, tobacco and grain, Excellent fall weather aided in the harvesting of high quality, disease-free crops. Late blight of potatoes and tomatoes did not reach serious proportions where sprays were regularly applied (G. W. Ayers).