

The Weather and Its Influence on Plant Diseases

The winter of 1933-34 will long be remembered on account of its long duration and the extreme sub-zero temperatures experienced throughout all the provinces from Manitoba eastward. As a consequence fruit trees, as well as ornamental trees and shrubs, suffered severe winter injury, especially in Ontario and Quebec, where winter began in late October before the trees had lost their leaves and become fully dormant. Snow and ice storms were also unusually severe causing more than the ordinary amount of damage. In contrast the winter was one of the mildest experienced in British Columbia.

At Saanichton, B.C., growth began approximately two weeks earlier than usual in the spring of 1934 on account of the previous mild winter and this early start was reflected in a similar advance in the blooming date of the fruit trees. This phenomenon appeared to favour some diseases. Shot hole (Cylindrosporium hiemalis) and blossom blight (Sclerotinia cinerea) were more severe on cherries than in the previous year. The former disease formed lesions not only on the leaves and pedicels, but even on the fruit, which are rarely attacked. Raspberries suffered considerable root injury and many plants were killed on Vancouver island as a result, it is believed, of the soil becoming water logged during the heavy rains in December and January.

Tulip fire (Botrytis Tulipae) was not serious this year; initial infection was slight and dry weather in April was unfavourable for its spread. Among the potato diseases early blight (Alternaria Solani) was very prevalent and more serious than usual. In some fields many plants wilted prematurely while in previous years merely the leaves were spotted. Late blight (Phytophthora infestans) also occurred in epidemic form causing a 30% reduction of the crop; it appeared about two weeks earlier than usual. Diseases were checked by dry weather in the summer months, but they had already caused considerable crop damage.

In the Okanagan valley precipitation was approximately normal and temperatures were slightly above average during the winter. In consequence insects overwintered in larger numbers, but damage caused by perennial canker (Gloeosporium perennans) was lessened. The season was about three weeks earlier than usual and fruit trees developed so rapidly, especially in the northern part of the district, that growers found it difficult to spray their apple trees for scab (Venturia inaequalis) at the proper time. In the Lavington district poor scab control was the result. The weather was extraordinarily favourable for the development of powdery mildew (Podosphaera leucotricha) and heavy losses occurred in unsprayed orchards. Lack of rains during the blossoming period prevented any serious outbreak of fire blight (Bacillus amylovorus).

Throughout central and southern Alberta the spring season began at least 10 days earlier than usual, the month of May being exceptionally warm. In general cereal crops made an excellent start, prospects being particularly good in the northern parts of zones 9 and 10 and in the Peace River area, where frequent showers were received during June and July. Rainfall was scant over practically all of southern Alberta and the soil became dry during July so that prospects for a reasonably good yield were greatly reduced. On August 23 a heavy frost severely damaged the late crops in north central Alberta as far south as Calgary. Although the Peace River district escaped this early frost, the season was too cool to mature the heavy growth of cereals before the early September frosts and much of the grain was immature when harvested.

No statement of the general weather conditions prevailing over Saskatchewan was supplied. At Saskatoon May was hot and dry with high winds and numerous dust storms. During June the weather was cool and the rainfall was well distributed over the month. It was greatly needed following the dry May and at the end of June the crops looked extremely promising. But it was hot and dry during July and the first two weeks of August which resulted in a shortage of moisture for several weeks before harvest. The last two weeks of August were very cool with scattered showers. Both hail and frost damage was severe in that part of the province. The weather conditions at Indian Head were similar. Crops on summer fallow with a good reserve of sub-soil moisture were fairly good in the district; but crops on stubble land were very poor due to the lack of sufficient rainfall during the growing season. Conditions appeared to favour the incidence of common foot rot, but to be unfavourable for rusts and leaf spots.

In the Niagara peninsula the prolonged period of cold weather in February caused much bud killing on peach trees of all ages and considerable injury to the wood in the older trees. March continued cold delaying early growth. However, the buds developed rapidly towards the end of April during fair mild weather, under conditions unfavourable for leaf curl infection. May was unusually dry, warm and sunny, the rainfall being only 0.52 inches compared with the previous 5-year average of 2.65 inches. As a result, primary scab infection was very light and fire blight of apple and pear was at a low ebb although it was epidemic in 1933. The dry weather probably accentuated the strawberry root rot, which was very evident early in the season. The absence of black knot in the plum orchard at the St. Catharines Laboratory was likewise due to the weather conditions in May, which is the critical month for infection. Drought conditions accompanied by high temperatures continued into June and July, although the rainfall was approximately normal. Trees affected by winter injury were unable to produce vigorous new growth on account of drought. Tobacco was also noticeably affected and blossom-end rot of tomato was prevalent. The widespread occurrence of yellowing of grape vines was probably in part due to

drought, as it disappeared later when the rainfall became normal. Wilt diseases, particularly *Verticillium* wilt of raspberry, were quite prevalent. August was cool and the rainfall normal, which favoured the development of late apple scab infection. On the other hand the cool temperatures were unfavourable for brown rot in stone fruits, which was epidemic in 1933. In this same period badly infected strawberry beds made good recovery from root rot.

In New Brunswick April was mild and the unusual depth of snow wasted away rapidly with the result that low-lying lands and river valleys were flooded by the highest freshet since 1923.

The first three weeks of May were cool and favoured a severe outbreak of damping off (*Rhizoctonia Solani*) in potatoes in Victoria, Carleton and York counties, the crop being reduced 20%. June was cool with frequent showers and crops made good growth. A heavy frost on June 7 caused considerable damage to vegetables and small fruits. July and the first three weeks of August were very hot and dry, masking the symptoms of potato mosaic, especially in the Saint John valley. Heavy rains fell the last week of August and were followed by cool weather the first two weeks of September. These conditions resulted in a severe outbreak of late blight of potato in Carleton and Victoria counties. The remainder of September was dry and warm. October was cold and a heavy fall of snow in Victoria and Carleton counties resulted in considerable frosting of potatoes in the field. Wet weather during the balance of the month made it difficult to complete the digging of potatoes and turnips.

In Prince Edward Island the growing season was rather dry, the total rainfall being 19.21 inches; however, it was more evenly distributed than in 1933 when it was very dry in the summer and exceptionally wet in September and October. Late blight and rot of potatoes were fairly prevalent, especially in unsprayed fields. Stem rust (*Puccinia graminis*) of wheat was destructive, primary infection taking place earlier than usual. Smuts of wheat, oats and barley were widespread and caused heavy losses. Wheat bunt, an uncommon disease in Prince Edward Island, was found throughout the province in 1934.