IV. DISEASES OF FRUIT CROPS

APPLE

SCAB (Venturia inaequalis) was fairly general at the Sidney Station, B.C., but the damage was slight (W. Jones). Owing to an exceptionally dry spring and summer, practically no apple scab developed in the Salmon Arm, Vernon, and Lavington districts. Less than 5% of the fruit were scabby in the unsprayed check trees in the spray plots at Salmon Arm, and no scabby fruit were found on any of the trees sprayed with lime sulphur or colloidal sulphur. At Lavington no scab was found on the fruits of the unsprayed trees, where normally 75% of the fruit of the check trees would be scabby (G.E. Woolloams). Scab was severe on some trees at the Morden Station, Man.

Weather conditions were favourable for primary infection, particularly between the pre-pink and calyx stages in Lincoln county, Ont. Primary ascospore discharge began on April 9, and primary infection began to show on May 27. Secondary foliage infection was apparent on June 7. In the Laboratory orchard, St. Catharines there was very little further development of apple scab, except on late terminal growth. Scab was of very minor importance on the fruit of the sprayed trees. Percentage of scabby fruit on the unsprayed and sprayed trees was as follows: Melba, unsprayed 41%, sprayed, trace; Joyce, 20%, trace; Hume, 19%, trace; Cortland, 19%, 1.5%; Fameuse, 12%, 1.5%; Delicious, 24%, none; Baldwin, 7.0%, none; Greening, 9%, trace; McIntosh, 42%, 1%. In a number of neighbouring orchards scab was a serious factor and the cause of considerable loss, due to delay in the application of the critical pre-pink and pink sprays (G.C. Chamberlain). Scab was very prevalent on unsprayed trees of McIntosh and Fameuse. About Guelph, 50-60% of the fruit were affacted on unsprayed McIntosh trees (J.E. Howitt). Storage scab was severe on Baldwin fruit received on March 19, 1938 from Burlington, Ont. (G.C. Chamberlain).

In western Quebec there was much less scab on the apple crop than in 1937. Ancospore discharge was considerable and moisture was not lacking, but the prevailing high temperatures during the early part of the season appeared detrimental. In general primary infection was abundant, but most of the lesions failed to survive the hot weather. The first spots also were more easily burned by lime sulphur under these conditions (F. Godbout). In eastern Quebec, ascospore discharge began on

May 17, although the spores were mature on April 12. Spore discharge occurred on rather few occasions, but continued until July 4. Scab infection was first noted on July 11 in the Experimental orchard, Ste. Anne de la Pocatiere. Among the commercial varieties, the most susceptible were North Star, Baldwin, Shiawassee, McIntosh, Wealthy, Fameuse, and Alexander. On the other hand Keetosh and Northwest Greening showed traces and Golden Russet was clean. Scab is fairly general throughout the district and difficult to control even with frequent sprayings. At the Cap Rouge Station lime sulphur and lime sulphur-iron sulphate spray gave excellent control of apple scab, while in the check, 85% of the fruit was scabby.

Ascospores were mature on April 20, at Fredericton, N.B.; ascopore discharge began on May 12 and ended on June 23. The first infection was found on June 2. Apple scab was severe on the foliage of unsprayed trees. Severe late scab developed on the fruit in September and November. (S.F. Clarkson)

The first ascospore discharge occurred in favourable locations at Kentville, N.S. on April 21. The first heavy liberation occurred during the period May 14-17, with subsequent moderate discharges on May 28, June 6, and June 12. The final discharge occurred on June 20, at which date the perithecia were found to be empty. The first conidial infection was observed on May 26, and by June 17, when observations were made on foliage scab in the spray plots, 45% of the foliage was affected on some unsprayed trees. Less than 1% foliage infection was present on trees sprayed with the standard spray materials.

An intensive extension programme by means of press and radio bulletins throughout the Annapolis valley was carried on urging frequent spray applications. In spite of much adverse weather in the latter part of the spraying season, splendid control of scab was obtained. Many orchards reported that the percentage of fruit of No. 1 grade was the highest in many years. Unsprayed fruit was worthless from scab alone. The autumn season was favourable for the normal defoliation of the trees and hence the early conditions have been good for perithecial initiation. (J.F. Hockey).

Scab infection was much less in P.E.I. this year than in the previous season. No ascopores were discharged till after the blossoming period, due to the very dry weather during June. Scab did nto cause trouble to any extent in the

Charlottetown district, where the trees were sprayed. Orchards that were not sprayed developed considerable scab towards the end of the season for July and August were very wet. Growers complained of some spread of scab in storage A warm open fall probably favoured its development in storage. (G.W. Ayers)

FIRE BLIGHT (Erwinia amylovora). Practically no fire blight developed this year in the Okanagan valley, B.C. A slight infection was observed on apple at Shoal Lake, Man., near Lake of the Woods. Twig blight was slight in an orchard of Greening and McIntosh in Lincoln county, Ont. The inoculum apparently came from a bordering woodlet, where blight was heavy on many wild hawthorns. The disease has also spread in to neighbouring pear trees (G.C. Chamberlain). Fire blight specimens were received from Milford Bay, Toronto, and Chesterville (H.N. Racicot). Fire blight infection was more prevalent and severe on the Island of Montreal and vicinity this year than last. Several mountain ash trees were also affected, especially in Outremont and Cote des Neiges (F. Godbout). Besides heavy damage to apple at Ste. Anne de Bellevue, many ornamental plants were also severely injured or killed outright. (I.H. Crowell)

Fire blight was found affecting 10% of the Wagner trees in one nursery in N.S. A trace was also found on McIntosh, Cortland, Delicious, and Gravenstein. The organism isolated from material from several points in Annapolis and Kings counties produced a rot on inoculation into green pears. (J.F. Hockey) Fire blight was severe on single trees of Tolman Sweet and Bishop Pippin in Queens county, P.E.I. It was also common in several uncared-for orchards.

RUST (Gymnosporangium clavipes) is gaining in importance as its spread becomes more general in Que. Among the commercial varieties at Ste. Anne de la Pocatiere, the most seriously affected this year were Alexander, Northwest Greening, North Star, Fameuse, Duchess, and Wealthy. In Alexander 37% of the fruit were affected. Several other varieties are entirely free. A few petiole and twig infections were found on Antonowka in a nursery at St. Roch des Aulnaies.

BLACK ROT (Physalospora obtusa) was fairly common in York and Queens county, N.B. The leaves were severely infected in an orchard at French Lake on June 2 and 75% had fallen. The fruit was also severely damaged. The disease is not controlled in N.B. by either the Bordeaux or lime sulphur sprays. It is

most severe in areas of high humidity. Crimson Beauty is the variety most susceptible to foliage infection, while Alexander suffers severe fruit infection (S.F. Clarkson). Black rot was found on Winton, Formac, and North Star at Ste. Anne de la Pocatiere, Que., and was heavy on Duchess in an orchard in Kings county, P.E.I.

POWDERY MILDEW (Podosphaera leucotricha) was observed only on the occasional leaf at Summerland, B.C. It was even scarce on apple seedlings, which are usually affected (G. E. Woolliams). A scattered infection was present in an orchard in Lincoln county, Ont. Traces of powdery mildew were observed on 3 young trees at Cap Rouge, Que. A few one year-old seedlings were moderately infected in a greenhouse at Kentville, N.S.

ANTHRACNOSE (Neofabraea malicorticis) was general on Vancouver island and in the Fraser valley, B.C. It is more severe in the latter area largely because control measures have not been adopted. Spraying with copper sprays before the fall rains begin, is more generally practiced on Vancouver island. (W. Jones)

EUROPEAN CANKER (Nectria galligena) caused severe injury to many limbs in a small orchard at Waterville, N.S. (K.A. Harrison)

CANKER (Cytospora leucostoma). One tree was half dead at Saskatoon, Sask. Canker (Cytospora sp.) is common on trees, which suffered winter injury in N.B. (S.F. Clarkson)

Daldinia grandis was common at Gull Lake, Sask., on apple and it was collected also at Saskatoon.

SILVER LEAF (Stereum purpureum). Two per cent of the apple seedlings at the Fredericton Station, N.B., were affected. The fungus was fruiting on frost weakened trees. The cankers increase but slowly (S.F. Clarkson). A trace of silver leaf was seen in Queens county, P.E.I., in an orchard of McIntosh, where the disease has been abundant in recent years. The marked decrease of the disease may be due to the higher summer temperature. (R.R. Hurst)

DROUGHT SPOT or CORKY CORE (boron deficiency) was virtually absent in any treated orchard in the Okanagan valley, B.C. The soil treatments with boric acid made two years ago, seem still to be 100% effective (R. Fitzpatrick)

Corky core affected about 1% of the fruit in an orchard in Queens county, N.B.

YELLOWS or CHLOROSIS (unknown) is a disease which occurs in the Okanagan valley, B.C., on certain soil types characterized by a high carbonate content. Although this chlorosis is similar to lime-induced (iron) chlorosis, the trouble is not corrected by iron salt applications. (R. Fitzpatrick)

BITTER PIT (non-parasitic) affected up to 20% of the fruit in a few orchards on Vancouver island, B.C. The varieties chiefly affected were King, Cox Orange, and Grimes Golden (W. Jones). Bitter pit was quite prevalent in the Okanagan valley this year, possibly on account of the peculiarly dry, hot summer (R. Fitzpatrick). Traces of bitter pit were found in Wealthy, Shiawassee and McSweet at the Ste. Anne de la Pocatiere Station, Que. Bitter pit affected 1-100% of the fruit of Baxter and Wealthy in orchards in York and Queens county, N.B. On August 30, bitter pit was noted on Baxter in the orchard. In a survey made on September 26, of six orchards in the Annapolis and Kings counties under observation for bitter pit, the average percentage of bitter pit was 2.3% and the highest was 4.6%. This is the lowest percentage of bitter pit recorded in these orchards since the study began (K.A. Harrison). Bitter pit was noted on Wealthy apples on the market at Charlottetown, P.E.I.

MOSAIC (virus) was found affecting a single tree in an orchard at Penticton, B.C. Its transmission by budding is being attempted (T.B. Lott). Mosaic was present in the varieties, Blenheim, Cox Orange, Ribston Pippin, King, Gravenstein, Talman Sweet, Delicious, Baldwin and Homestead, in the Annapolis valley, N.S. Suckers from the stocks of affected tubers also showed the disease and it has been transmitted by budding and grafting. (J.F. Hockey)

FLAT LIMB (scion-stock incompatibility) is appearing on increasing numbers of 2- and 3-year old grafts of this variety in the Annapolis valley, N.S. The trouble is decreasing in older trees as they are usually cut out when seriously affected. In one orchard half the trees are affected. The condition has been known in the province for over 40 years and was first seen by the writer in 1923 (J.F. Hockey). Flat limb is also known on Vancouver island, B.C. (W.C. Foster). The trouble is illustrated by McAlpine (D. McAlpine. Bitter pit investigations, first progress report, p. 98, figs. 126-128. 1911-12)

CROWN GALL (Phytomonas tumefaciens). A number of small galls occurred on several young trees interplanted in an old orchard at Waterville, N.S. (K.A. Harrison)

WATER CORE (non-parasitic). A trace was seen in York county, N.B.

TWIG BLIGHT (Nectria cinnabarina). A trace was observed on several trees in orchards which had suffered winter injury in York and Queens counties, N.B. Extensive cankers caused the death of two limbs in an orchard in Kings county, N.S.

Twig blight (Gonatobotrys simplex) caused a trace of damage on Fameuse in York county, N.B. The fungus was fruiting (J.L. Howatt and S.F. Clarkson). A Phomopsis sp. was found associated with twig blight caused by winter injury in Carleton and York counties, N.B.

WOOD ROT (Schizophyllum commune) was present in apple orchards in N.B., where the trees suffered winter injury. The fungus is a week parasite and apparently causes little damage to uninjured, vigorously growing trees (S.F. Clarkson). The fungus was fruiting profusely at every stub left in pruning in a tree of Blushed Caville in the University orchard, Saskatoon, Sask. (T.C. Vanterpool)

HEART ROT (Fomes applanatus). Sporophores of the fungus were found on the roots at the base of a Delicious tree, which was partially dead, at Summerland, B.C. (G.E. Woolliams). A heart rot canker was moderate in 5 Rome Beauty trees and severe on one McIntosh at Penticton, B.C. (T.B. Lott)

CROWN ROT (cause unknown). It is estimated that about 1% of all apple trees in the Okanagan valley, B.C., are suffering from crown rot. (R. Fitzpatrick)

ROT (Botrytis cinerea) affected an occasional fruit of Red Siberian Crab, at Kentville, N.S. A few fruits of King were also rotting following insect injury. (J.F. Hockey)

ROT (Sclerotinia americana) affected a few clusters of fruit on unsprayed trees at Kentville, N.S.

PINK ROT (Tricothecium roseum) was present in orchards where scab was severe in York county, N.B. (S.F. Clarkson). An occasional fruit was affected in the orchard, but it was fairly common in storage at Kentville, N.S. (J.F. Hockey)

BITTER PIT (Glomerella cingulata) caused slight to severe damage to the Dudley, Alexander, and Fameuse apples at the

Fredericton Station, N.B. It caused moderate to severe damage in storage to apples from an orchard in York county, which had been sprayed but once during the growing season. (S.F. Clarkson and J.L. Howatt)

STORAGE ROTS. Alternaria Mali caused a rot of 6% of the Dudley apples in storage in Feb. 1938 at the Fredericton Station, N.B. Other varieties were much less affected. Gloeosporium album was found on apples in storage on Jan. 3, 1938 and in April, 45% of Northwest Greening apples were affected (S.F. Clarkson and J.L. Howatt). Some apples of Dudley and Alexander in storage were affected by Botrytis sp. in Nov. 1938 in York county, N.B.

FLY SPECK (Leptothyrium Pomi) was common on Dudley apples in September and November at the Fredericton Station, N.B. A trace was also observed on August 21, at Gagetown. (S.F. Clarkson)

SOOTY BLOTCH (Gloeodes pomigena). A trace was seen on Fameuse at the N.B. apple exchange in November. (S.F. Clarkson)

HAIL INJURY. A strong wind and hail storm damaged 75% of the No. 1 fruit in the Quebec district, Que., in August. (C. Perrault)

FOLIAGE INJURY (nitrogen burn). An unusual foliage injury characterized by a cupping and greyish speckling of the leaves was observed in an orchard in Lincoln county, Ont. The trouble was apparently due to the application of cyanide to a neighbouring asparagus bed during a wind as the trouble was severe on the side next the bed and diminished rapidly in the more distant rows. (G.C. Chamberlain)

SPRAY INJURIES. A trace of russetting was observed in N.B. apple orchards; Bordeaux mixture for the pre-pink and pink sprays caused no more russetting than lime sulphur. A trace of lime sulphur injury occurred in a few orchards. (S.F. Clarkson)

Severe burning of the foliage occurred in the orchard spray plots at Kentville, N.S., where lime sulphur was applied under extremely humid conditions. Some wettable sulphurs produced severe burning under similar conditions. Russetting was general on the fruit where copper containing sprays were applied at the pink and calyx applications. On Cox Orange these sprays caused severe russetting and rendered much of the fruit unmarketable. They also caused a flecking on the fruit of Wagner, Ben Davis, Northern Spy, where the trees were sprayed very late in the season or the spray came from the bottom of the tank. (J.F. Hockey)

LEAF SPOT (Phyllosticta sp.) affected 40% of the foliage of Blenheim in an orchard in Kings county, N.S. The spotting probably followed slight spray injury. The trouble is common, but seldom to the extent observed in this orchard. (J.F. Hockey)

SCORCH (potash deficiency) was moderate in an orchard in Lincoln county, Ont.

FROST caused slight to moderate damage to McIntosh and other varieties in York county, N.B., on May 19, when the temperature dropped to 29°F. The varieties were in the pre-pink stage. (S.F. Clarkson)

APRICOT

HEART ROT (Polyporus hirsutus). Fruiting bodies of the polypore were found on several of the main branches on a large living tree at Naramata, B.C. (G.E. Woolliams)

BLACKBERRY

MOSAIC (virus). A few plants were affected at South Berwick, N.S. The mottling took the form of an interveinal clearing with puckering along the veins and dark areas in the leaves. (J.F. Hockey)

BLUEBERRY

RUST (Calyptospora Goeppertiana) affected about 1.0% of the plants in a small barren in Charlotte county, N.B. (J.L. Howatt)

GREY MOULD (Botrytis cinerea). Specimens showing twig blight and decay of immature fruit were received from Pennfield Ridge, N.B. (J.F. Hockey)

CHERRY

SHOT HOLE (Higginsia hiemalis (Cylindrosporium hiemalis). A severe infection was observed at Morden, Man. While very little of this disease appeared this year in commercial orchards in the Niagara peninsula, Ont., it was a problem at the Vineland Experimental Station in seedling stocks and in nursery rows, for early

leaf fall makes budding much more difficult and definitely less successful (D.L. Bailey). Shot hole was general and caused moderate damage on unsprayed trees in N.B. (S.F. Clarkson). Shot hole was very severe on seedlings at Kentville, N.S. (J.F. Hockey) The disease caused little trouble this year in P.E.I. A slight infection was present at Southport, where it was severe in 1937 (G.W. Ayers).

BLACK KNOT (Dibotryon morbosum). Specimens were received from St. Anselme, Que., and Maccan, N.S. It was slight to severe on wild cherries in parts of N.B. and P.E.I.

BROWN ROT (Sclerotinia americana) was found on fruit submitted by F. Dian, Dominion Fruit Inspector, who reported the disease general about Needles, B.C. (G.E. Woolliams). It caused severe damage to unsprayed sour cherries in Gloucester county, N.B. In a Bordeaux spray plot in the Station orchard, Kentville, N.S., 50% of the fruit of the sweet cherries, Windsor and Black Tartarian, were rotted, while the sour cherry, Montmorency, was comparatively free (J.A. Boyle). Brown rot destroyed half the crop in an orchard at Deep Brook, N.S.; some twig blight was also present (J.F. Hockey).

POWDERY MILDEW (Podosphaera Oxyacanthae) was fairly general, but caused slight damage in North Saanich area, B.C. (W. Jones). Infection was moderate in a nursery of mixed varieties at Kelowna. A trace was seen at Willson Landing. (T.B. Lott)

CRINKLE (genetic weakness). During a survey for virus diseases in the Okanagan valley, in 1938, cherry mottle leaf was not definitely observed. Instead, out of 2,963 trees examined, crinkle was found affecting 7% of the Bing trees and 24% of the Black Tartarian, while other varieties were practically free. In all 183 trees were affected. The symptoms of the trouble varies with the variety, age, and vigour of the tree. The crop of marketable fruit is often only a third to a half of that of a normal tree. Individual fruits are smaller, of poorer quality, and less attractive in appearance. In the Bing affected fruits show a pronounced groove down one side, while in the Black Tartarian the fruit has a lumpy or pimply appearance. Affected leaves, particularly on the spurs, are smaller with very irregular margins and vary greatly in size and shape, some being ten times as long as broad. The leaf surface is crinkled or puckered, with small raised areas between the veins, a symptom which has suggested the name "crinkle" for the trouble. In late summer or when the

soil is dry, the leaves exhibit a more pronounced rolling parallel to the midrib. In many trees crinkle occurs throughout the tree, while in others typical crinkle is found on but one or more limbs, branches or spurs. The cause of crinkle is unknown, but the condition corresponds closely to the bud sports observed in many plants. Healthy grafts on to crinkle trees have given normal branches, while crinkle grafts on a normal tree have produced crinkle branches, but there is no transfer of the trouble to the healthy parts. (cfr. C.F. Kinman. Jour. Agr. Res. 41:327-335. 1930)

Besides crinkle some abnormality of the foliage was seen in 1,059 trees in the Okanagan valley; typical examples of the abnormalities have been selected for further study. (T.B. Lott)

GREY MOULD (Botrytis cinerea). An occasional fruit was affected in the orchard at Kentville, N.S.

YELLOW LEAF (undetermined) moderately affected several orchards in Lincoln county, Ont. (G.C. Chamberlain)

SILVER LEAF (Stereum purpureum) is affecting a few bushes of the Oka cherry at Rosthern, Sask.

HEART ROT (Fomes applanatus). A sporophore was found on a root of a living tree at Summerland, B.C., by T.B. Lott. (G.E. Woolliams)

CRANBERRY

RED GALL (Synchytrium Vaccinii) severely infected the leaves, stems, and flowers of cranberry in a bog at Port Mouton, N.S. The damage was severe, most of the buds being killed. In addition red gall was moderate but conspicuous on the stems of Gaylussacia baccata and slight on Chamaedaphne calyculata, both of which were in the affected bog. It was also common on Myrica gale at the edges of the bog. A few moderate leaf infections of Synchytrium aureum on Lysmachia terrestris were collected in the same bog by R.J. Baylis. (J.F. Hockey)

HARD ROT (Sclerotinia Oxycocci) was present in 2 bogs comprising about 20 acres in Kent county, N.B. In one bog in an area of one acre, practically all the berries were destroyed. In another bog in Westmoreland county, 35% of the berries were damaged. (J.L. Howatt and S.F. Clarkson)

STORAGE ROTS. Fusicoccum putrefaciens was isolated from berries in storage from Sunbury county, N.B., and Gloeosporium minor from berries from Gloucester county. (J.L. Howatt)

Gibbera compacta was found on only a few leaves of cranberry from Port Mouton, N.S. (J.F. Hockey)

RED LEAF (Exobasidium Vaccinii) caused heavy defoliation in a small bog at Lower Caraquet, N.B. Traces were present at St. Peters, P.E.I.

CURRANT

WHITE PINE BLISTER RUST (Cronartium ribicola) was less severe than usual in the variety plots of the Horticultural Division, Central Experimental Farm, Ottawa, Ont. Susceptible varieties of currants were slightly affected, while all varieties free from rust in the previous 3 years were again clean. No rust whatever was observed on the gooseberry varieties (H.J. Read). The rust caused complete defoliation of a planting of Black Giant by Sept. 30 in Lincoln county. Although the rust is common, its prevalence varies with spraying practises (G.C. Chamberlain). Infection was heavy, but the damage was slight at Macdonald College, Que. (I.H. Crowell). Rust was heavy on black currants in two home gardens near Campbellton, N.B., in late August (I.L. Conners). This rust was very prevalent on black currants in Kings, Annapolis, and Halifax counties, N.S. Mature aecia on the white pine were seen about May 15 (J.F. Hockey). Red currants were slightly to severely infected at Charlottetown, P.E.I. (R.R. Hurst)

POWDERY MILDEW (Sphaerotheca mors-uvae) was severe on the young leaves of black currants at Saskatoon, Sask. A small planting of currants were moderately infected at St. Amable, Que. (F. Godbout)

GOOSEBERRY

POWDERY MILDEW (Sphaerotheca mors-uvae) was severe on the fruit and slight on the terminal leaves at Saskatoon, Sask. It was severe on the leaves and was causing the fruit to drop in specimens from St. Gregor. It was moderately severe on the berries at Victoria Beach, Man. A specimen was received from Hastings, Ont. It destroyed half the crop in a heavily infected gooseberry

planting at St. Amable, Que. A very severe outbreak occurred at Aldershot, N.S., practically destroying the crop. The disease was slight to moderate in Queens county, P.E.I.

SEPTORIA LEAF SPOT (Mycosphaerella Ribis (Septoria Ribis) was severe on gooseberry at Morden, Man.

GREY MOULD (Botrytis cinerea) as a twig and stem blight killed a few plants at Sidney, B.C. (J. Bosher)

TWIG CANKER (Nectria cinnabarina) affected one plant at Waterville, N.S. (K.A. Harrison)

GRAPE

DOWNY MILDEW (Plasmopara viticola) was reported from Britannia Heights, Ont. A slight infection was noted at Macdonald College, Que. The disease was heavy on a few vines in a garden at Yarmouth, N.S.

POWDERY MILDEW (Uncinula necator) was heavy causing shelling of the fruit of Fredonia, a very susceptible variety in Lincoln county, Ont. (G.C. Chamberlain)

SHELLING (excess moisture) affected about 1% of a vineyard of the Lincoln variety in Lincoln county, Ont. The trouble showed up on vines along water courses and in low areas, where the land was flooded during heavy mid-season rains. The affected vines possessed a deficient root system and the wood was slow in maturing. The variety is a vinifera type and is apparently susceptible to excess moisture. The vines were healthy in well drained areas of the vineyard. The trouble is similar to that described by F.E. Gladwin. (Non-parasitic malady of the vine. N.Y. (Geneva) Bull. 449. 1918) (G.C. Chamberlain).

LOGANBERRY

DRY BERRY (Haplosphaeria deformans)is fairly general on Vancouver island in low areas with high humidity and where the plantings are close to the susceptible wild thimble berry. (W.R. Foster.

PEACH

LEAF CURL (Taphrina deformans) was more general than usual this year at Summerland, B.C. Infection was slight on most trees, although it was sometimes conspicuous. However, it was insufficient to warrant spraying (R.E. Fitzpatrick and G.E. Woolliams). While leaf curl was not prevalent in well sprayed orchards in the Niagara peninsula, Ont., the disease was spotty in the district and infections ranging from 10 to 50% were seen in scattered orchards. (G.C. Chamberlain)

BROWN ROT (Sclerotinia americana) was the cause of considerable loss in both early and late maturing varieties in the Niagara peninsula, Ont., particularly in unsprayed orchards. (G.C. Chamberlain)

SCAB (Cladosporium carpophilium) disfigured a considerable part of the fruit in orchards of the Ruthven district, Ont. (L.W. Koch). A heavy fruit and foliage infection was noted in one orchard in Lincoln county. (G.C. Chamberlain)

BACTERIAL SPOT (Phytomonas Pruni) was present in several orchards near Cedar Springs, Ont. In one orchard some trees were half defoliated. (L.W. Koch)

CORYNEUM BLIGHT (C. Beijerinckii) was severe on a few trees at North Saanich, B.C. (W. Jones). It caused appreciable damage to peaches in Essex county, Ont., especially in the Leamington district (L.W. Koch). This is the first report to the Survey from Ontario.

POWDERY MILDEW (Sphaerotheca pannosa) was found on the occasional tree at Summerland, B.C. It affected both foliage and fruit (G.E. Woolliams). A slight infection was noted in one orchard in Lincoln county, Ont. (G.E. Chamberlain)

VERTICILLIUM WILT (V. sp.). A slight infection was seen on scattered trees in an orchard in Lincoln county, Ont.

YELLOWS and LITTLE PEACH (virus). The Survey of the Ontario Department of Agriculture indicates a reduction in the number of trees affected in the Niagara peninsula, Ont., as follows:-

Township	1937	1938
Niagara	670	334
Louth	496	185
Stanford	88	76
Clinton	560	515
Grantham	244	42
TOTAL	2,058	1,152

(R.S. Willison and G. Dustan)

POTASH DEFICIENCY was noted in one orchard of Valiant and Vidette varieties in Lincoln county, Ont.

WINTER INJURY complicated by canker girdled 50-60% of the trees, which were planted in heavy soil in a Welland county planting, Ont. Injury varied from a flecking of the cortical bark tissues to a killing of the bark just above the ground level. The damage was incurred in early winter. The trees had been "mounded up" in the fall, thus covering the sensitive bark developed just above soil level. (R.S. Willison)

PEAR

SCAB (Venturia pyrina) was general on the twigs of the Anjou variety in February at the Sidney Station, B.C. Later scab was general throughout the season on Vancouver island and the lower mainland. Twig lesions may initiate early spring infection before the asci are shot (W. Jones). Scab affected 75-90% of the fruit of Barlett and Keiffer in an orchard of 2,500 trees in Welland county, Ont., which had been badly neglected for over 10 years. The wild scrubby growth and the lack of spray had permitted a marked increase in the inoculum. Ordinarily these varieties are rarely affected (G.C. Chamberlain). It was severe on a single tree at Kingston, Ont. (H.N. Racicot). Scab was slight to severe on unsprayed trees in York and Sunbury counties, N.B. (S.F. Clarkson). Infection was heavy on Flemish Beauty at Charlottetown, P.E.I. (R.R. Hurst)

FIRE BLIGHT (Erwinia amylovora) was practically absent in the Okanagan valley, B.C., this year (G.E. Woolliams). About 25% of the twigs including a few extensive areas involving the larger limbs and branches were blighted in an orchard of Barlett and Kiefer in Lincoln county, Ont. In another block of Barlett infection was extensive in one corner. (G.C. Chamberlain)

DROUGHT SPOT (mainly boron deficiency). Growers report a 75% improvement following boric acid applications in orchards at Summerland, Penticton, and Naramata, B.C., but complete cures have not been effected. It is probable that two or more separate disorders are being included under the single term, Drought Spot. (R. Fitzpatrick)

POWDERY MILDEW (Podosphaera Oxyacanthae) was quite severe on much of the fruit on unsprayed check trees in the experimental spray plots at Summerland, B.C. (G.E. Woolliams)

SOOTY BLOTCH (Leptothyrium Pomi) was general and causing a serious blemish to Kieffer fruit in an orchard in Lincoln county, Ont. (G.C. Chamberlain)

SPRAY INJURY. Severe burning of the foliage resulted in an orchard in Lincoln county, Ont., when an arsenical spray was applied from a spray tank that had been used previously for applying sodium chlorate as a herbicide. (G.C. Chamberlain)

PLUM

PLUM POCKETS (Taphrina communis or T. Pruni) was moderately common on certain varieties at Indian Head, Sask. It was also moderate at Winnipeg, Man. Plum pockets was very prevalent on wild plums in Northern Ontario. In many small plum orchards in western Que., infection varied from 10 to nearly 100%. It was also heavy on Ile Bizzard and at Defoy. It was severe at Bass River, N.B. A few fruit were found on one tree in a sprayed orchard at Kentville, N.S. A slight outbreak was observed at Charlottetown, P.E.I., but where the orchards are sprayed the disease is not important.

BROWN ROT (Sclerotinia americana) a few rotten fruit were seen at Morden, Man., on August 29. The disease was severe in small orchard plantings at Eganville and London, Ont. Brown rot was quite severe in some orchards in P.E.I. although it was not epidemic as it was in 1937. It was especially noticeable in two orchards at Charlottetown, on the variety Krakenbaus. (G.W. Ayers)

SHOT HOLE (Higginsia prunophorae (Cylindrosporium prunophorae). Infection was slight to moderate on several trees in the University orchard, Sask., and throughout the orchard at Brandon, Man. It was severe on Waneta, but slight on the other varieties at St. Anne de la Pocatiere, Que. Shot hole was severe on several unsprayed trees in York county, N.B.

LEAF SPOT (Phyllosticta circumscissa) was general and severe at Morden, Man.

BLACK KNOT (Dibotryon morbosum) was genral and unusually severe in several orchards in one district in Lincoln county, Ont. (G.C. Chamberlain). Specimens were received from London, Ont. A slight infection occurred in a small orchard in Kamouraska, Que. Black knot was quite severe on all unsprayed old plum trees in N.B. About 30 small trees were riddled with black knot in a home garden at Douglastown, N.B.; very few could be salvaged by pruning out the knots. The disease was found on Magnum Bonum, Green Gage and Lombard at widely scattered points in P.E.I.

BACTERIAL SPOT (Phytomonas Pruni) caused a loss of 25% of fruit of Shiro in two orchards in Lincoln county, Ont. (G.C. Chamberlain)

PRUNE

VIRUS DISEASE. One prune tree, which showed symptoms similar to that described by H.E. Thomas and E.M. Hildebrand (Phytopathology 26:1145-1148. 1936) was observed in the Okanagan valley, B.C., but its identity has not yet been checked by experiment. (T.B. Lott)

HEART ROT (Polyporus versicolor) was found as a wound parasite on one tree and Fomes applanatus was fruiting on another at Hatzic, B.C. (W. Jones)

RASPBERRY

ANTHRACNOSE (Elsinoe veneta) was general on the Newman variety with lesions in May on the young, current season's canes at Sumas, B.C. (W. Jones). The disease was prevalent in two plantings in Lambton and Elgin counties, Ont. The variety, Taylor, like its parent, Lloyd George, appears very susceptible to anthracnose (G.C. Chamberlain). Anthracnose was slight to moderate, particularly on Newman in Que. (H.N. Racicot). Traces were present on Lloyd George at Charlottetown, P.E.I.

SPUR BLIGHT (Didymella applanata). Traces of spur blight were reported in Ont. It was common causing slight to moderate damage in N.B. It was prevalent in P.E.I. this year, particularly in small garden patches.

MOSAIC (virus). About 30% of the plants were affected with mosaic in 2 plantings at Burnaby, B.C. Mosaic was severe in one planting at Bird's Hill, Man. Mosaic occurred in Ont. in varying amounts in all plantings of Cuthbert, Viking, and Latham, particularly of the first two. Percentage of plants affected ranged from a trace to 20% (G.C. Chamberlain). Mosaic was severe on Latham, Viking, Chief, in 2 plantings at Navan, while Cuthbert showed only a trace. Mosaic was present in most nursery plantings in Que.; it was severe in a few plantings of Latham. A low percentage of plants were affected in the varietal plots at Ste. Anne de la Pocatiere and Cap Rouge. One planting was infected 100% at Charny. Mosaic affected 50% of the Viking and 35% of the Newman in one planting in York county, N.B.; in general mosaic was slight to moderate. Mosaic was noted on several varieties in P.E.I.

LEAF CURL (virus) was rarely encountered in Ont., except at scattered points and only on Cuthbert (G.C. Chamberlain). Leaf curl affected 10% of the Newman plants in one nursery and small percentages were present on this and other varieties in Que. One per cent of leaf curl was present in one planting and a trace in several others in York county, N.B. A single affected plant was seen in a small nursery at Waterville, N.S.

YELLOW BLOTCH CURL (virus) was found affecting 15% of the plants in a commercial nursery planting in Wentworth county, Ont. (G.C. Chamberlain)

CROWN GALL (Phytomonas tumefaciens) affected 50-60% of the plants in a 5-year old planting of Cuthbert, which has been destroyed in Lincoln county, Ont. It is also common in nursery raspberry plantings (G.C. Chamberlain). A diseased plant was seen at St. Jean Port Joli, Que., and traceswere present in Viking and Herbert in P.E.I.

VERTICILLIUM WILT (V. sp.) affected a trace of the plants in a Cuthbert planting in Waterloo county, and 1% of the plants of a Cumberland planting in Lambton county, Ont. (G.C. Chamberlain)

YELLOW RUST (Phragmidium Rubi-idaei) was general on Cuthbert and Viking on the lower mainland and Vancouver island, B.C. It caused less damage than in 1937, due to the dry season. Lesions on the new canes appear to develop into cankers on the fruiting canes which resemble somewhat cane blight. Telia are found in such cankers. (W. Jones)

LATE RUST (Pucciniastrum americanum) is common in central Ontario. The Viking variety is most susceptible, although commonly found on Chief and Latham; Cuthbert and Newburgh appear more resistant. This year the disease appeared late in the season, but became very prevalent (G.C. Chamberlain). This rust caused severe damage to the fruits of Viking and Newman in one plantation in York county, N.B. It was particularly severe on Viking. The variety was sprayed on June 30 and July 11 with Bordeaux mixture. A trace of spray injury was apparent on the berries on July 25; slight to moderate control of the rust resulted (S.F. Clarkson and J.L. Howatt). It was severe on the berries of Viking at Jacquet River. Rust was heavy on Viking and Lloyd George in a planting near blue spruce in Queens county, P.E.I.

CANE BLIGHT (Leptosphaeria Coniothyrium (Coniothyrium Fuckelii). About 25% of the bearing canes were blighted in a ¼-acre planting of Lloyd George at Rock Creek, B.C.; occasionally all the canes in a stool were affected (G.E. Woolliams). A moderate general infection was present in a planting at Bird's Hill, Man. The disease was moderate in a garden at St. Jean Port Joli and severe in a second in Levis county, Que. (C. Perrault)

POWDERY MILDEW (Sphaerotheca Humuli) was rather severe on a few rows of Latham on Vancouver island, B.C. It was severe in a garden at Edmonton, Alta. Powdery mildew was common in nursery plantings of Latham in several counties of Ont. The cane growth was stunted and the tips spindly. However, in most cases, the stunting was of little importance. (G.C. Chamberlain). It was also slight to severe in several plantations in Ont. Powdery mildew was severe in a planting at St. Jean Port Joli; the development of the fruit and the growth of the canes were affected (R.O. Lachance). It was heavy in several Latham nursery plantings in Que.

SEPTORIA LEAF SPOT (S. Rubi) was recorded from Howick, Que. It was also heavy on Herbert in nursery plantings.

SCORCH (Potash deficiency) was slight in a nursery planting of Brighton at Port Burwell, Ont.

DIE BACK (Armillaria mellea). Numerous plants were attacked and a few killed by die back in 2 plantings at Hatzic, B.C. (W. Jones)

Polyporus versicolor was found growing on the crowns of a few unthrifty plants at Hatzic, B.C. (W. Jones)

SANDCHERRY

SILVER LEAF (Stereum purpureum) was found affecting sandcherry at Rosthern, Sask.

POWDERY MILDEW (Podosphaera Oxyacanthae) lightly infected the leaves at Saskatoon, Rosthern, and Makwa, Sask. The disease was severe at Selkirk, Man.

BROWN ROT (Sclerotinia americana) caused a very severe twig and fruit blight in a small planting at Kentville, N.S. (J.F. Hockey)

STRAWBERRY

LEAF SCORCH (Diplocarpon Earliana (Marssonina Fragariae) was general on British Sovereign, but the damage was slight on the lower mainland and Vancouver island, B.C. (W. Jones). A slight but well scattered infection occurred in the University plots, Saskatoon, Sask. (T.C. Vanterpool). Leaf scorch was present on 7 varieties at Ste. Anne de la Pocatiere, Que. and a slight to moderate infection occurred at Cap Rouge.

LEAF SPOT (Mycosphaerella Fragariae) was severe on plants from Keene, Ont.; otherwise the disease was light. It was a trace to slight on most varieties at Cap Rouge and Ste. Anne de la Pocatiere, Que., but infection was moderate to severe on a few varieties. Leaf spot was common throughout N.B. and severe in plantations at Springhill, Keswick Ridge, and Douglas.

POWDERY MILDEW (Sphaerotheca Humuli) slightly infected a new seedling at the Sidney Station, B.C., but it was not observed in commercial plantings. Scattered infections were recorded on Premier in Lincoln county, Ont. The disease was severe on Cartier, Abbott, McGee, King, and Dick at Cap Rouge, Que., while it was a trace or absent on the remaining 37 varieties. Powdery mildew was of little importance in P.E.I.

ROOT ROT or BLACK ROOT (cause unknown) was severe at the Creston Substation, B.C. Mr. G. Thorpe, the Superintendent, reported "It occurs on plants of all ages. Some fields have been completely wiped out. Also some varieties appear to be more susceptible than others". (G.E. Woolliams) Root rot infection was slight in one planting and severe in patches in another near St. Norbert, Man.

During 1938, root rot occurred in a severe and typical form in the Niagara peninsula and the Clarkson-Oakville district, Ont. In most plantations at cropping time, more or less extensive patches of dead plants were present. Its greater severity this season was probably due to the limited precipitation during the critical period for strawberries. In 1937, from April 26 to June 30, there were 8.72 inches of rain, which was so well distributed that the soil remained continually moist throughout. During the corresponding period this year, the precipitation was only 4.14 inches or less than half of 1937. Moreover with a rainfall of 2.29 inches for May, there were two periods, each of 8 days' duration when practically no rain fell. Thus during the most critical period in the current season, drought conditions aggravated the disease situation and the combined effect was the failure of more than the usual number of plants. (A.A. Hildebrand)

About 1% of the plants showed black root in 6 out of 30 representative plantations, surveyed in N.B. (S.F. Clarkson)

Armillaria mellea was found causing a crown and a root rot in plantings at Sidney and Whonnock, B.C.; some plants were killed. (W. Jones)

SCORCH (Potash deficiency). What appeared to be a potash deficiency was found affecting 1.5% of the plants in 4 plantations of Senator Dunlop at Charlottetown, P.E.I.(R.R. Hurst)

LEAK (Rhizopus sp. and Botrytis sp.). Several cars of strawberries, mostly British Sovereign, shipped from New Westminster were almost a total loss on arrival at their destination on the Prairies. It was found that over ripe berries had been shipped from fields where the fruit were already affected (W. Jones). There was a slight scattered infection of Botrytis in many commercial plantations in Kings county, N.S.; the fruit were very soft and decayed easily. (J.F. Hockey)

GREY MOULD (Botrytis sp.) was causing slight to severe blighting to the lower leaves of the plants at Grand Lake, N.B., on May 11. (S.F. Clarkson and J.L. Howatt)