IV. DISEASES OF FRUIT CROPS

A. POME FRUITS

APPLE

FIRE BLIGHT (Erwinia amylovora) was general at Edmonton, Alta., but was less severe than in 1946 (J.D.G.). At Saskatoon, Sask., it showed up here and there on susceptible trees; early in the season it was more severe than in 1946, but it was checked by hot, dry weather in July (T.C. Vanterpool). Fireblight caused severe damage in a commercial nursery near Prince Albert; the owner thought the disease to be endemic on wild hosts, especially the saskatoon; preliminary examination showed only Dimerosporium Collinsii on the latter plant (R.J. Ledingham). Although they seldom show extensive injury, various native species of Amelanchier, Aronia, Crataegus, etc., in Eastern Canada are attacked especially by the blossom blight phase of the disease; they unquestionably play some part as both reservoirs and distributors of the pathogen (D.B.O.S.). Very little fire blight developed in orchards of southwestern Que., in 1947 (F. Godbout, L. Cinq-Mars). Blight was conspicuous on isolated apple trees along the highway from Lévis to Ste. Anne de la Pocatière, where cankered limbs are left from year to year (C. Perrault).

STORAGE ROT (Gloeosporium album). In the apple storage tests at Kentville, N.S., of the rotted apples examined in April, 1946, 96% of Northern Spy, 66% of Cortland and 35% of Wagner yielded this organism. In 1947 losses were negligible (K.A. Harrison).

RUST (Gymnosporangium spp.). G. Juniperi-virginianæ caused up to 5% fruit infection of early and mid-season varieties in Essex Co., Ont. (L.W. Koch). Rust occurred on McIntosh windfalls in the Laboratory orchard, St. Catharines, but only a trace was found on harvested fruit; an infected cedar is located west of the orchard (G.C. Chamberlain). A trace to 1% infection of G. clavipes occurred on Delicious, Gravenstein and Cortland in the spray plots at Kentville, N.S. Junipers grow within 100 ft. of the Delicious and 200 yd. of the Gravenstein trees. Crataegus and Amelanchier along the fence-row were severely rusted (J.F. Hockey).

TWIG BLIGHT (Nectria cinnabarina associated). Twigs were killed in a small nursery at Ste. Anne de la Pocatière, Que.; winter injury appeared to have been a factor (R.O. Lachance).

PERENNIAL CANKER (Neofabraea perennans). The wooly aphis parasite, Aphelinus mali, was released in the Okanagan Valley, B.C., in 1929; and distribution was made from the original release points for several years by the staff of the Vernon Entomological Laboratory. At this time the canker phase of N. perennans started to decline and has recently been of minor importance, although the pathogen is still widespread. In 1947 the wooly aphis population built up very rapidly,

following the use of DDT to control codling moth. It seems probable that the DDT has reduced the parasite population. The effect of the wooly aphis increase on the incidence of perennial canker remains to be seen (A.B. Baird, H.R. McLarty).

ROT (Penicillium expansum) affected a few fruits of King at harvest at Saanichton, B.C. (W. Jones).

BLACK ROT (Physalospora obtusa) caused slight damage to the fruit of Winter Banana at North Saanich, B.C. (W. Jones). Leaf spotting was seen in twelve orchards in southwestern Que. (L. Cinq-Mars).

POWDERY MILDEW (Podosphaera leucotricha). Almost 100% of the seedlings in the nursery at the Station, Summerland, B.C., were severely affected (G.E. Woolliams). Infection was 10-15% in 2-year-old Cortland, Lobo and Fameuse in cellar storage in Lincoln Co., Ont., in late March. Damage was confined to the apical 2-6 in. and was most severe on Cortland; McIntosh was slightly affected. The disease appeared to have developed somewhat in storage (G.C. Chamberlain). Mildew caused moderate damage at Greenwich, N.S., to young trees imported from Ontario in the spring (J.F. Hockey).

SCAB (Venturia inaequalis) caused moderate damage at Vancouver, B.C. (I.C. MacSwan). It was seen in varying amounts on several varieties in the Fraser Valley (R.E. Fitzpatrick). Some scab occurred on McIntosh in the Grand Forks district, but caused little damage (G.E. Woolliams). In all but the best-sprayed orchards in the Kootenays scab reduced the marketable crop of all varieties, particularly McIntosh, unsprayed fruit of which were 90-100% infected (M.F. Welsh).

In well-sprayed orchards in Ont., scab was of minor importance. In several orchards in Norfolk and Middlesex Co., considerable infection resulted from poorly timed or inadequate sprays. In an orchard of mixed varieties at Carlisle, where both fungicide and schedule were unsuitable, heavy defoliation occurred in mid summer and all fruit was badly scarred; the outbreak was aggravated by the orchard being surrounded by brush and tall poplars. In the Laboratory orchard, St. Catharines, unsprayed trees were heavily infected and were losing their leaves by 8 July; in sprayed plots infection on harvested fruit ranged from 1.8 to 25.4%. Scab was reported to be epidemic in the Brighton and Trenton district (G.C. Chamberlain). Severely scabbed fruits were received from Fort William, where the disease was stated to have been most noticeable on Osman and Robin crabs and Haralson apples. A specimen of McIntosh was received from Northfield Station, with the statement that the apples were rotting on the trees. Moderately affected Delicious specimens were received from Lachine, Que. (H.N. Racicot). In southwestern Que., scab caused great losses. Perithecia developed slowly but were very numerous. Heavy and frequent rains during the pink, blossom and calyx stages interfered with spraying and resulted in abundant primary infection. Continued wet weather in June and July favoured spread. A hot, dry August checked the disease but further development occurred in the fall. A light carry-over, thorough and timely spraying whenever possible, and, to some extent, spraying or dusting during bloom enabled a few growers

to secure clean crops (F. Cadhout, L. Cinq-Mars). In eastern Que., scab was easily controlled in carefully tended orchards and infection was light (R.O. Lachance).

In the St. John R. Valley, N.B., mature ascospores were found 22 May, the first ascospore discharge was recorded 28 May and heavy discharges occurred during bloom. Primary infections were seen 15 June. Despite heavy rain in May, June and early July commercial growers were able to apply their sprays and many obtained excellent scab control. In poorly tended orchards infection ranged up to 100% on McIntosh and Cortland. Rank growth aggravated the situation. Dry, hot weather in August, September and October curbed the disease and allowed ready control with mild fungicides (S.F. Clarkson, J.L. Howatt). In the Annapolis Valley, N.S., the first ascospores matured 15 April and the first spore discharge was recorded 1 May. The heaviest discharges occurred 21-27 May when trees were in the pink or full bloom stages. Primary infection was found 22 May. Over twice as many ascospores were released per unit leaf area as in the past few years. Effectiveness of scab control in commercial orchards was variable. There was much late infection at harvest on winter varieties (J.F. Hockey). Scab caused slight damage even to McIntosh in adequately sprayed commercial orchards in P.E.I., but it was heavy on wild trees (R.R. Hurst).

MOSAIC (virus). Three trees of Bethal at the Station, Fredericton, N.B., have shown a distinct interveinal mottle for 7 years, but their growth seems to be unaffected. One seedling in the Laboratory orchard has shown pronounced interveinal mottling and severe leaf distortion for 10 years. The tree is now dwarfed and the fruit small (D.J. MacLeod).

BITTER PIT (non-parasitic) affected 3 out of 10 Baldwin and 3 out of 7 Spy trees in an orchard in Lincoln Co., Ont. The crop on affected trees was light and about 5% of the fruit was badly pitted (G.C. Chamberlain).

DROUGHT SPOT, etc. (boron deficiency). Three growers who had taken over neglected orchards in the Creston district, B.C., reported abnormal growth. In each case boron deficiency was found to be the cause. Severe die-back occurred in Delicious and drought spot in McIntosh. There was no record of boron having been applied previously (M.F. Welsh). Two examples of affected fruit were seen in P.E.I. (R.R. Hurst).

LEAF MOTTLE (nutritional deficiency). Young apple and plum trees in a garden at Yorkton, Sask., showed interveinal mottling in an area where subsoil from an excavation had been added; trees elsewhere in the garden were unaffected (T.C. Vanterpool).

WATER CORE (physiological) was moderate in King and Charles Ross at Saanichton, B.C. King is very susceptible (W. Jones). Considerable water core was seen in susceptible varieties at Fredericton in September and October, but it gradually disappeared in storage (J.L. Howatt).

WINTER INJURY. Most orchards in the St. John R. Valley, N.B., showed slight to moderate damage to the intermediate buds of the previous year's growth, especially near the top of the tree. Injured buds, when not killed, were delayed 2-3 weeks in opening and their foliage was chlorotic, crimped and small (J.L. Howatt). Severe injury occurred on all Spy trees in an orchard in Queens Co., P.E.I. The trees made poor growth and bore small leaves and fruit. This condition was apparently due to the fibrous roots being torn off by frost action when the ground was bare. On examination new roots were seen to be forming at the points of fracture (R.R. Hurst).

PEAR

TWIG BLIGHT (Botrytis cinerea). This organism was isolated from dead twigs of a few trees at Sidney, B.C. Its pathogenicity was not tested (W. Jones).

FIRE BLIGHT (Erwinia amylovora). The plantings in the Creston Valley, B.C., were severely blighted in 1947. By fall it was hard to find a completely unaffected tree. In many young trees cankers reached the scaffold limbs and trunks. The provincial department of agriculture is undertaking the inspection of all plantings during the winter (M.F. Welsh). Three adjacent trees in the centre of a block of 300 young Bartlett in Lincoln Co., Ont., were completely killed, but the remainder were unaffected. The infected trees were 500 ft. from a wild apple tree. Scattered trees of Bartlett showed twig and branch infection in several other orchards in the county in May and infected Flemish Beauty was seen in one. In Wentworth Co., blossom and twig infection of 1946 resulted in severe killing of branches in a Bartlett orchard; some trees lost 50% of the bearing wood. Infection was most severe in an area close to a block of King apples in which blight was present. The pear orchard was in sod but had received 1 1/2 lb. cyanamid per tree in 1946. Kieffer in the same orchard escaped infection. Little current season's infection was seen in the Niagara Peninsula (G.C. Chamberlain).

BLOSSOM and TWIG BLIGHT (Sclerotinia laxa) caused slight to moderate damage to Bartlett and, especially, Anjou at Sidney, B.C. The fungus was isolated and the Monilia stage also occurred on the blossoms. First report to the Survey on pear. (W. Jones).

PINK ROT (Trichothecium roseum) affected about 10% of Clapp's Favorite at Kentville, N.S., following heavy scab. The affected fruit was too bitter to eat. First report on pear (K.A. Harrison).

SCAB (Venturia pirina) was seen on several varieties, particularly Flemish Beauty, in the Fraser Valley, B.C. (R.E. Fitzpatrick). Flemish Beauty in an orchard in Lincoln Co., Ont., showed 20-30% severe fruit infection and 50% leaf infection (G.C. Chamberlain). Infection was a trace to moderate at Ste. Anne de la Pocatière, Que. (H.O. Lachance). Scab severely damaged Bartlett in an orchard at Charlottetown, P.E.I. (R.R. Hurst).

STONY PIT (virus). Several specimens of Bosc were submitted from the lower Fraser Valley, B.C. (R.E. Fitzpatrick). The suspected occurrence of stony pit in Ont. (P.D.S. 25:90) was confirmed in 1947 when all the fruits of a tree grafted with scions from the diseased Anjou were pitted and malformed. The fruit resembled that described as due to stony pit. This was the first fruit harvested from the tree since it was grafted. The disease was also found on Anjou in a second orchard (G.C. Chamberlain).

DROUGHT SPOT (boron deficiency). Severely affected fruits were received from Covehead, P.E.I. (R.R. Hurst).

WINTER INJURY. Wilting and die-back of 1-3 year old wood of Kieffer and Bartlett was common in young orchards in Norfolk, Brant and Lincoln Co., Ont., in June. The condition resembled fire blight but no pathogen was present. The injury was associated with excessive growth and lack of crop in 1946 and consequent immaturity of wood. It may have been aggravated by ice on the trees in December and January (G.C. Chamberlain).

B. STONE FRUITS

APRICOT

CORYNEUM BLIGHT (Clasterosporium carpophilum). Fruit scab and leaf spot were severe on all varieties throughout the Kootenay district, B.C. (M.F. Welsh).

BLACK KNOT (Dibotryon morbosum) caused slight damage to Anida at Agassiz, B.C. (T. Anstey).

CHERRY

CROWN GALL (Agrobacterium tumefaciens) was found to be attacking a few unthrifty trees at Keating, B.C. (W. Jones).

CORYNEUM BLIGHT (Clasterosporium carpophilum). The leaf spotting and defoliation seen in Creston Valley, B.C., appears to be due to C. carpophilum rather than Higginsia hiemalis. Fruit damage was seen on a few trees in sprinkled home gardens in Creston (M.F. Welsh).

BLACK KNOT (Dibotryon morbosum) caused severe damage in one orchard near Charlottetown, P.E.I. (R.R. Hurst).

LEAF SPOT (Higginsia hiemalis) was severe on leaves and fruit pedicels in most of the more humid parts of the Kootenay district, B.C., including Boswell, Crawford Bay, Riondel, Sunshine Bay and Willow Point, causing defoliation and reduction of fruit quality in all varieties

(M.F. Welsh). Leaf spot was prevalent on sour cherry in the Fonthill district, Ont., in mid June, and was epidemic on Montmorency. In the main fruit belt below the escarpment little damage occurred before the end of July where full spray schedules were followed; but in some orchards with a light crop spraying was neglected and the disease caused premature defoliation. It was general and prevalent late in the season on Schmidt's Bigarreau and Napoleon Bigarreau sweet cherries in Lincoln Co., causing early defoliation. Other commercial varieties are less susceptible (G.C. Chamberlain).

BLOSSOM BLIGHT (Sclerotinia laxa) caused slight damage at Royal Oak, B.C. (W. Jones).

BROWN ROT (Sclerotinia fructicola). In an orchard at Kootenay Bay, B.C., most of the crop was lost through blossom blight. There was also some twig blight and rotting of ripe fruit (M.F. Welsh). In the Niagara Peninsula, Ont., unsprayed sweet cherries suffered 100% rotting of blossom pedicels, and losses were 5-50% in sprayed or dusted orchards according to the timeliness of application. Losses were 25-40% in Montmorency sour cherry. With continued wet weather after bloom 3-25% rotting of green fruit occurred, commonly starting where blossom remnants adhered to the young fruit (G.C. Chamberlain).

WITCHES' BROOM (Taphrina ?cerasi) heavily infected a planting of six dwarf cherries at Stanhope, P.E.I.; first record in P.E.I. (R.R. Hurst).

LAMBERT MOTTLE (virus). Little typical Lambert mottle was seen in the Okanagan Valley, B.C., but what seems to be a severe form of it was found on Lambert in a few orchards where it had not been seen before (T.B. Lott).

LITTLE CHERRY (virus). Extensive surveys by Provincial and Dominion staffs, covering nearly all the bearing cherry trees in the Okanagan Valley, B.C., failed to show any definite little cherry. A single tree was removed on suspicion, under the new Provincial compulsory removal order, although the symptoms were not typical (T.B. Lott). Little cherry now occurs in all cherry-growing districts in the Kootenays, having been detected for the first time in the Rhondel and Canyon districts. In Creston Valley increase of the disease was indicated by a seriously reduced crop quality. An extensive survey by workers in Washington State revealed little cherry in all important cherry-growing districts east of the Cascades (M.F. Welsh). It may be noted that little cherry appears particularly amenable to detection by the method recently described by R.C. Linder (A rapid chemical test for some plant virus diseases. Science 107:17-19. 1948).

NECROTIC RING SPOT (virus). Six orchards of Montmorency sour cherry in Lincoln Co., Ont., were surveyed in 1945. Of these 5 were then known to have 56-72% infected trees, but the virtual absence of trees showing the severe (shock) symptoms associated with current season infection suggested that infection had nearly reached saturation and it was estimated at about 96%; for trees with long-standing infection often

are nearly symptomless. In the sixth orchard the 16% of trees known to be infected was taken to be a reliable figure because the number of trees with shock symptoms suggested invasion of the block to be in an early phase. Re-examination of these orchards supported these views for only in the sixth orchard were there many new trees showing symptoms. Of 21 Montmorency blocks surveyed for the first time, 3 (316 trees) showed no symptoms; 8 (964 trees) showed 1.7-20.4% (av. 10.4%) mild symptoms only; 6 (1362 trees) showed 0.7-15.2% (av. 5.4%) mild symptoms, and 0.6-3.8% (av. 1.6%) shock symptoms; and 4 (650 trees) showed 7.5-20.0% (av. 11.1%) mild symptoms, and 14.1-25.7% (av. 18.5%) shock symptoms, indicating active spread. Figures for mild symptoms may be low owing to masking by spray residue. Six blocks in an isolated plantation in Halton Co. on the south slope of the escarpment showed a range of 0-2.7% (av. 1.1%) mild symptoms, and 0-1.9% (av. 0.6%) shock symptoms. These blocks range from 2 to 30 years in age. Infection was presumably introduced with the nursery stock (R.S. Willison). See R.S. Willison, G.H. Berkeley and G.C. Chamberlain. Yellows and necrotic ring spot of sour cherries in Ontario, distribution and spread. Phytopathology, in press.

RASP LEAF (virus) was seen in two orchards in the Okanagan Valley, B.C., about 15 miles from the nearest known infection. Eight infected trees were found in one and two in the other a quarter mile away. Infection appeared to be recent (T.B. Lott). Three infected trees of Lambert were found in June in a small block at Erickson, one having all foliage affected and the others with a single affected branch apiece. In September two more diseased trees were found in this block and one in an adjacent block. This is the first report of rasp leaf in the Kootenays (M.F. Welsh).

SMALL BITTER CHERRY (cause unknown). During extensive cherry surveys in the Okanagan Valley, B.C., a few affected trees were found in addition to ones seen in previous years. All diseased trees found have been in the southern part of the area where western X disease of peach is common. Except for one Lambert, all affected trees seen have been Bing. In Lambert the symptoms are similar and are quite distinct from those of little cherry (T.B. Lott). See T.B. Lott, Sci. Agric. 27:260-262. 1947. This trouble is not considered important except for possible confusion with little cherry. Affected trees bear both normal fruits and stunted, malformed, unpalatable ones that never ripen fully. Attempts to transmit the condition by grafting have failed.

TATTER LEAF (virus). In a survey of 26 sweet cherry orchards in the Niagara Peninsula, Ont., two were found to contain suspected but no positively infected trees; in the remainder definite infection ranged from 0.9 to 42.9%. One grower reported that a 60-year-old Schmidt's Bigarreau had shown symptoms of the disease ever since he bought the orchard 20 years ago, and that he had sprayed it annually in the belief that the trouble was shot hole. On sweet cherry fine brown lines delimit necrotic areas, which soon abscise to give a tattered effect. Some leaves show only chlorotic spotting or oak-leaf patterns. The symptoms are confined to leaves formed early in the spring and are usually recurrent. An expert and observant grower reports that in his

orchard Deacon is most severely affected, failing to ripen its fruit normally. Seneca is also severely affected. In Elkhorn the foliage is badly shredded but the effect on the crop is not conspicuous. Bing, Lambert, Windsor, Tartarian, and Schmidt's and Napoleon Bigarreau show varied degrees of tattering but no serious effect on the crop (R.S. Willison).

TWISTED LEAF (virus). No new infections were seen in the Okanagan Valley, B.C. (T.B. Lott).

YELLOWS (virus). In eight orchards of Montmorency sour cherry in Lincoln Co., Ont., first surveyed in 1945, the average definite infection increased from 34 to 39%, but, owing to weak symptoms or heavy shot-hole infections in some blocks, actual infection may have been about 50%. In several blocks a number of trees that had shown yellows in 1945 showed no symptoms in 1947. Symptoms are usually recurrent in this disease and the reason for these apparent recoveries is not known. In 20 newly surveyed blocks infection ranged from 2.6 to 58.0%, averaging 20.7% plus 3.6% doubtful trees. In 6 blocks in Halton Co. infection was 3.9-59.7%, average 40.5% plus 3.6% doubtful trees (R.S. Willison).

DIE BACK (boron deficiency). In three widely separated orchards in the Kootenays, B.C., which had not received boron applications, slow emergence from dormancy, death of many buds and distortion of leaves were seen. All trees showed at least partial recovery late in the season (M.F. Welsh).

CRINKLE (bud sport) was seen in 7 of 26 sweet cherry orchards in southern Ont. surveyed in 1947, usually in Black Tartarian or Bing. Four trees were affected in one block of seven. Elsewhere infection ranged up to 8.5%. Usually only small parts of trees were affected, suggesting that such sports may occur relatively frequently. Occasionally a whole tree is affected, indicating that the condition may be distributed in propagating stock (R.S. Willison). Previously reported from B.C.

MOTTLED FOLIAGE (cause unknown) was seen in Lincoln Co., Ont., during surveys of Montmorency orchards. Up to 40% of the trees were affected, but generally the rate was less than 5%. One form of mottling may be due to growth factors; but the second, less regular form suggests prune dwarf infection. There is no apparent injury. In various sweet cherry varieties up to 30% of the trees showed a mottling distinct from the growth mottle type, often in the form of faint rings of various sizes; this may be prune dwarf but the cause has not yet been determined. Indexing has shown that both prune dwarf and necrotic ring spot are often present in sweet cherries although usually more or less masked (R.S. Willison).

PEACH

SCAB (*Cladosporium carpophilum*). Three affected fruits were received from Toronto, Ont. (H.N. Racicot).

CORYNEUM BLIGHT (*Clasterosporium carpophilum*). Several specimens of infected fruit were received from the Lower Fraser Valley, B.C. (R.E. Fitzpatrick). All phases of this disease are serious throughout the Kootenays, and a few trees were killed. Growers in the Creston Valley have started to spray with 4-6-40 Bordeaux (M.F. Welsh).

BROWN ROT (*Sclerotinia fructicola*). Following a heavy hailstorm in Essex Co., Ont., on 30 Aug., all orchards in the affected area of 6 sq. mi. were severely attacked by brown rot within a week; up to 60% of the fruit was lost. The large amount of inoculum in the hailed orchards aggravated brown rot injury elsewhere in the county (L.W. Koch).

In the Niagara Peninsula blossom blight was serious and was not easily controlled with the ordinary spray schedule. In spray experiments infection of Valiant averaged 35% in sprayed blocks and 40% in the checks; in Rochester infection was 16 to 24% in sprayed blocks and 26.5% in the check; in Elberta 2 applications of wettable sulphur gave 2% infection against 7% in the check. Losses from brown rot were generally heavy in mid-season varieties, which provided heavy inoculum for the late crop; but dry weather in September kept losses fairly low. Rot in late varieties was very variable. It was correlated to some degree with prevalence of fruit moth, but other factors were involved. These include: poor spray cover or timing; incomplete spray schedule, often because of inability to get spray equipment between trees near harvest time; faulty air drainage, due to topography, windbreaks, close planting or dense foliage; thin or injured skin, due to rapid growth or rough handling; lack of sanitary precautions in orchard or packing house; and failure to let fruit dry before picking. Observations at Vineland Station indicate that some growers' packs are much more subject to decay than others. In a test on Valiant for the comparison of spray schedules, the full schedule gave one third as much rot in the orchard as the check, an extra prepick spray gave no improvement, and eliminating the later sprays gave some increase of rot. In a test with Rochester wettable sulphur with a sticker gave good control, little more than half the rot with wettable sulphur alone and one sixth that in the check. In a test with Elberta wettable sulphur, especially with a sticker, was also outstanding. In these three tests observations on stored fruit showed similar trends (R.S. Willison). Brown rot caused little loss in N.S.; up to 2-3% infection occurred in some early varieties (K.A. Harrison).

LEAF CURL (*Taphrina deformans*) was seen on all varieties in unsprayed and inadequately sprayed orchards in the moister districts in the Kootenays, B.C. (M.F. Welsh). In the Niagara Peninsula, Ont., leaf curl was epidemic in poorly sprayed or unsprayed orchards, but was negligable where efficient spraying was done (G.C. Chamberlain).

CANKER (*Valsa* sp.) was severe on young trees of Veteran and Vedette at Cliffside, Vancouver Island, B.C. (W. Jones).

WILT (*Verticillium* ?*albo-atrum*) attacked 4 trees in a block of 100 2-year-old Fisher in Lincoln Co., Ont. The affected trees showed

heavy defoliation in late July. Tomatoes had preceded the peach trees and had been used as an intercrop (G.C. Chamberlain).

WART (virus). A single infected tree was found, for the first time, in the Okanagan Valley, B.C. (T.B. Lott).

WESTERN X DISEASE (virus) continued to spread slightly in the southern Okanagan Valley, B.C. In mapped orchards new infections were somewhat fewer than in some recent years (T.B. Lott).

X DISEASE (virus). Infection was seen in three trees out of several hundred 2-year-old budded seedlings in Wentworth Co., Ont. Chokecherries occurred about 500 ft. away (G.C. Chamberlain).

RUSTY SPOT (cause unknown). This trouble was seen on scattered trees in the Okanagan Valley, B.C. It seriously injures the affected trees, but is of little importance because few trees are attacked. It has been seen for about 15 years in this area, but shows no definite signs of spread (T.B. Lott).

SPRAY INJURY. Arsenical injury was caused in the laboratory orchard, St. Catharines, Ont., (1) by the addition of polyethylene polysulphide to the regular mixture of sulphur, lead arsenate, lime and zinc sulphate; and (2) by using the arsenical mixture with aluminum sulphate and lime sulphur. In commercial orchards arsenical injury resulted from the occasional omission of lime or from using slowly dissolving forms of zinc sulphate (R.S. Willison).

PLUM

CORYNEUM BLIGHT (Clasterosporium carpophilum) caused severe leaf spotting on a few trees at Milner, B.C. (W. Jones). At Creston considerable damage occurred in Peach plum and Santa Rosa prune, especially where inter-planted with peach or apricot. In one orchard the fruit scab on Peach plum rendered the crop unfit for picking (M.F. Welsh).

BLACK KNOT (Dibotryon morbosum). A trace was found at Courtenay and Saanichton, for the first time on Vancouver Island, B.C. It is widespread in the Fraser Valley (W.R. Foster). It is present in all parts of the lower Fraser Valley and appears to be increasing rapidly especially in the Chilliwack and Mission districts (R.E. Fitzpatrick). Scattered infections were seen on Reine Claude in a commercial orchard in Lincoln Co., Ont. (G.C. Chamberlain). Specimens were received from Toronto (L.T. Richardson).

BRANCH ROT (Schizophyllum commune) was seen at Delhaven, N.S., on trees apparently injured by wet soil (J.F. Hockey).

BROWN ROT (Sclerotinia fructicola) fruited on specimens received from Windsor, Ont. (H.N. Racicot). Incidence of brown rot on unsprayed fruit at St. Catharines was: Monarch 16%, Lombard 14%, Yellow Egg 10%, Imperial Gage 6%, Opinelus 5%, Reine Claude 4%, and Italian Prune 1.5% (G.C. Chamberlain). Specimens of severely rotted blue plums were received from Smith's Falls (L.T. Richardson). Some brown rot was present in specimens from Laverlochère, Que., and all the fruit of a single tree at Westmount was infected (H.N. Racicot). Despite spraying, brown rot was heavy in the orchard at the station, Kentville, N.S., damage ranging from 5 to 30% (K.A. Harrison). Infection was 25% on Victoria at Southport, P.E.I. (R.R. Hurst).

PLUM POCKET (Taphrina communis). Damage was a trace at Alameda, Sask. (W.W.M.). Specimens were received from Wapella (T.C. Vanterpool). Specimens and reports of 100% infection were received from Kenora, Chelmsford and Haileybury, Ont., and Laverlochère, Que. (H.N. Racicot, L.T. Richardson). One specimen was brought in from Charlottetown, P.E.I. (R.R. Hurst).

RUST (Tranzschelia Pruni-spinosae) caused light damage at Chilliwack, B.C.; first report from the mainland (J.W. Eastham). This material has not been seen. Two specimens from Vancouver Island, collected at Cowichan (P.D.S. 25:71) and Sidney, are assignable to the variety discolor (D.E.D.S.)

DIE BACK (boron deficiency). Several trees in a small prune orchard in the Sumas district, B.C., showed typical symptoms (R.E. Fitzpatrick). Gummosis and corky areas in fruit of Italian prune were common in the Grand Forks and Salmon Arm districts (G.E. Woolliams).

SAND CHERRY

POWDERY MILDEW (Podosphaera Oxyacanthae) was severe on leaves and fruit of several bushes in a garden at Red Deer, Alta. (M.W. Cormack).

C. RIBES FRUITS

CURRANT

WHITE PINE BLISTER RUST (Cronartium ribicola) caused heavy defoliation of Black Giant and Boskoop Giant at Vineland, Ont., and it was commonly seen in nurseries in Lincoln, Welland and Elgin Co. (G.C. Chamberlain). Rusted black currant leaves were received from Campbellford and York Mills (H.N. Racicot). Rust was heavy on black currant at Charlottetown, P.E.I. (D. Robinson), and infected leaves were received from Summerside (R.R. Hurst).

ANTHRACNOSE (Pseudopeziza Ribis). A moderate general infection of unsprayed Black Giant was seen in Lincoln Co., Ont. (G.C. Chamberlain).

SEPTORIA LEAF SPOT (Mycosphaerella Grossulariae) was severe on red and black currants at the Experimental Farm, Indian Head, Sask. A moderate infection was also seen in a garden at Saskatoon (R.J. Ledingham).

POWDERY MILDEW (Sphaerotheca mors-uvae) caused slight damage to black currants at L'Assomption, Que. (L.T. Richardson).

GOOSEBERRY

WHITE PINE BLISTER RUST (Cronartium ribicola) was general, but caused slight damage, on Poerman at Duncan, B.C. (W. Jones).

SEPTORIA LEAF SPOT (Mycosphaerella Grossulariae) varied from a trace to heavy in a garden at Charlottetown, P.E.I. (W. Hodgson).

POWDERY MILDEW (Sphaerotheca mors-uvae). A specimen was received from D'Arcy, Sask., moderate damage in a garden being reported (H.W.M.). A moderate infection occurred on English gooseberry in Lincoln Co., Ont., but repeated spraying effectively protected the fruit (G.C. Chamberlain). Specimens were received from Kamouraska Co., Que., with the statement that all the fruit became infected (H.N. Racicot).

D. RUBUS FRUITS

RASPBERRY

CROWN GALL (Agrobacterium tumefaciens) was found on Latham at Campbellford, Stayner and Port Burwell, Ont., during roguing of virus-infected plants (G.C. Chamberlain). A single infected plant was found at the Botanical Garden, Montreal, Que., and a severe infection was seen in the town of Mount Royal (J.E. Jacques). In a Viking plantation in York Co., N.B., 50% of the plants showed severe infection (D.J. MacLeod). A single infected plant of Washington was found at Kentville, N.S., during roguing for virus diseases (K.A. Harrison).

SPUR BLIGHT (Didymella applanata) was found on a few plants at Edmonton, Alta. (A.W. Henry). Spur blight is very common on Latham in Ont., especially in plantations used for propagation. It was prevalent in 15 out of 33 plantings of Latham examined. Indian Summer, Marcy and Taylor were also found infected (G.C. Chamberlain). Specimens were received from Port Colborne and Brockville, Ont., and Hudson Heights, Que. (H.N. Racicot, L.T. Richardson). Infection was 30-40% in a 1/2 acre planting of Newburg and Gatineau in Yamaska Co. (R. Desmarteau). Spur blight was severe on almost all varieties in nurseries at Ste. Anne de la Pocatière and Deschambault. Mortality was high in one new

planting (C. Perreault). Damage was very severe in a planting at Kentville, N.S. There was some spotting of the leaves in addition to the cane lesions (K.A. Harrison). Spur blight was widespread and very injurious throughout P.E.I. (R.R. Hurst).

ANTHRACNOSE (Elsinoe venata). A trace was found on Herbert in a nursery at Carman, Man. (W.E. Sackston). The unsprayed part of a 1/2 acre of Taylor in Lincoln Co., Ont., showed 65%. In sprayed areas infection was 8-45% with greatly decreased severity. Anthracnose was prevalent, reducing growth, killing tips and cracking open the canes of Bristol and Morrison black raspberries at Port Burwell; Marion and Sodus purple raspberries suffered less damage. The disease was heavy and caused death of the tips of Columbian purple raspberry at Bloomfield, Prince Edward Co.; secondary infection by cane blight was also a factor (G.C. Chamberlain). A trace of anthracnose was seen in a nursery at Deschambeault, Que. (C. Perreault). In the mulch plots at the Station, Kentville, N.S., infection was 100% on Newburg, Taylor and Viking. Percentage of cane survival was less for all varieties in hay-mulched plots than in clean plots; but sawdust mulch gave increased survival of Newburg and Viking, and reduced survival of the susceptible Taylor. Some spur blight was also present in these plots (K.A. Harrison). At the Station, Charlottetown, P.E.I., infection was heavy on Lloyd George, Rideau and Trent, moderate on Gatineau; and trace on Madawaska, Viking and 0263 (R.R. Hurst).

DRY BERRY (Heplosphaeria deformans) affected half the fruit of Lloyd George at Agassiz, B.C.; this variety appears to be very susceptible under conditions of poor air drainage (W. Jones).

CANE BLIGHT (Leptosphaeria Coniothyrium) was heavy at Kentville, N.S. (D. Creelman), and specimens were received from Colchester, Hants and Kings Co. (J.F. Hockey).

SEPTORIA LEAF SPOT (Mycosphaerella Rubi) was fairly common on Rubus macropetalus at Courtenay, B.C. (W. Jones).

YELLOW RUST (Phragmidium Rubi-idaei). Traces occurred in a garden patch of Washington at Summerland, B.C. (G.E. Woolliams).

LATE YELLOW RUST (Pucciniastrum americanum) was general on Viking in a nursery propagation bed at Stayner, Ont., but the effect on cane growth was negligable despite early leaf fall. Specimens of Viking were received from Renfrew; the rust was said to have caused early defoliation and to have infected the fruit (G.C. Chamberlain). Two severely rusted leaves were received from Hemmingford, Que., with the statement that three rows of a one acre planting were affected (H.N. Racicot). Severely affected fruit of Viking was brought in at Charlottetown, P.E.I. (R.R. Hurst).

POWDERY MILDEW (Sphaerotheca Humuli) was common in a nursery at Carman, Man.; it was less prevalent on Newman and Chief than other varieties (W.E. Sackston). In propagating beds and plantations in Ont.,

Latham is often stunted and the cane tips spindly. Ottawa is also susceptible and Viking is occasionally attacked (G.C. Chamberlain).

WILT (Verticillium albo-atrum) seriously injured 1600 out of 2000 plants in a year old patch of Viking at Dixie, Ont. A cool, wet spring and the growing of tomatoes on the land in 1946 aggravated the attack (G.C. Chamberlain).

DECLINE (virus). Several examples of what appeared to be this disease were seen in the Fraser Valley, B.C. (R.E. Fitzpatrick).

LEAF CURL (virus), probably mixed with some other virus, was sent in from a garden at Humboldt, Sask. (T.C. Vanterpool). Scattered infections were seen in three commercial plantings of Cuthbert, Viking and Taylor in Ont. All infected stools were severely stunted and worthless (G.C. Chamberlain). Infection was 2% in a Viking plantation near Fredericton, N.B. (D.J. MacLeod). Three plants were affected in a 1/2 acre block at Kentville, N.S. (K.A. Harrison).

MOSAIC (virus) completely ruined a small patch at Edmonton, Alta. A moderate infection occurred in Chief and Gatineau at the Beaverlodge Station (J.D.G.). Scattered infections occurred in 18 of 133 plantings inspected in Ont. The varieties most commonly infected were Latham, Viking, Ottawa, and Taylor. Plantings of Starlight and Early Sunrise were found with 15-25% infection. Two commercial blocks of Taylor showed 5-10% infection with marked stunting of diseased plants. Taylor shows little tolerance of mosaic (G.C. Chamberlain). Infection was 7-8% in a 1-acre field at Abbotsford, Que. (R. Desmarteau). Up to 5% infection was seen in Viking and Newburg plantings at Kentville, N.S. (D. Creelman). At the Station, Kentville, infection was 2% in Viking and Taylor, the latter being most seriously affected (K.A. Harrison). Infection was 4% in a planting of Lloyd George at Charlottetown, P.E.I. (R.R. Hurst).

E. OTHER FRUITS

BLUEBERRY

CANKER (Godronia Cassandrae) was present in all plantations examined in N.S., at Aylesford, Kentville, Upper Dyke and Scotsburn, infecting Grover, Pioneer and seedlings. Generally only one or two shoots of a plant were attacked. Apothecia were found on 3-year-old cankers in one plantation. Previously reported from B.C. and Que. (D. Creelman).

POWDERY MILDEW (Microsphaera Alni var. Vaccinii). Traces were seen at Aylesford and Kentville, N.S. (D. Creelman).

STUNT (virus) infected 1% of about 1000 plants at Kentville, N.S. The affected plants were rogued in the fall. First report to the Survey (J.F. Hockey).

FIG

TWIG BLIGHT (Botrytis sp.) was seen at the Station, Saanichton, B.C. (W. Jones).

GRAPE

DEAD ARM (Fusicoccum viticola) caused stunting and dying back of 8% of a block of 864 vines of Concord in Lincoln Co., Ont. Infection was 12% in the Laboratory vineyard, St. Catharines. The disease is present in most Concord plantings (G.C. Chamberlain).

BLACK ROT (Guignardia Bidwellii). Pedicel infection was seen on Ontario near Harrow, Ont. (A.A. Hildebrand). Infected clusters were seen on 2% of the vines of a block of Delaware used in a spray experiment for downy mildew control in Lincoln Co. Traces were also seen in a block of Fredonia (G.C. Chamberlain).

DOWNY MILDEW (Plasmopara viticola). On 10 July observations in Lincoln Co., Ont., showed infection as follows: Fredonia, 48% of vines infected and considerable fruit infection; Agawam, 31% of vines infected with a trace on fruit; Delaware, 29% of vines infected only on foliage. (G.C. Chamberlain).

POWDERY MILDEW (Uncinula necator) was a trace on unsprayed Delaware in Lincoln Co., Ont. (G.C. Chamberlain).

CHLOROSIS (cause unknown) is common in Lincoln Co., Ont. In one Concord vineyard 250 of 1000 vines were affected. Severe chlorosis is accompanied by stunting of growth, and small, late maturing fruit clusters (G.C. Chamberlain).

STRAWBERRY

ROOT and CROWN ROT (?Botrytis sp.). Killing of plants in patches in a large commercial planting at Edmonton, Alta., was seen in May and September. Botrytis sp. was isolated on each occasion (T.R. Davidson).

LEAF SPOT (Mycosphaerella Fragariae) was general in a 10 acre field of Pitt at Bradner, B.C. (W. Jones). Infection was 100% and damage about 20% in a field at Lanoraie, Que. The disease spread from a weedy corner of the field (F. Godbout).

RED STELE (Phytophthora Fragariae) caused moderate damage in wet parts of a field at North Saanich, B.C. (W. Jones). Red stele was found on 30% of the farms of growers who applied for certification of plants. Over 2,000,000 plants were certified as apparently free from red stele in the first year of certification, of which 1,600,000 were

sold. These plants appear to have helped growers to keep their land free from the pathogen. Ridging to improve drainage seems to reduce losses (W.R. Foster).

LEAK (Rhizopus nigricans) was severe in a planting of Senator Dunlap in Queens Co., P.E.I. Slug injury may have initiated some of the infection (D. Robinson).

POWDERY MILDEW (Sphaerotheca Humuli) was fairly prevalent on several seedlings at the Station, Saanichton, B.C. (W. Jones).

CRINKLE (virus). Traces were seen in three plantations of Senator Dunlap in Queens Co., N.B. (D.J. MacLeod).

MILD MOSAIC (virus) affected 2% of one and 3% of a second planting of Senator Dunlap in Queens Co., N.B. (D.J. MacLeod).

WITCHES' BROOM (virus) affected about 1% of a large plantation of British Sovereign in the Fraser Valley, B.C., set out in 1946. Infected plants produced no saleable crop (R.E. Fitzpatrick). Twenty-two infected plants, which bore little or no crop were found in a field of Senator Dunlap in Queens Co., N.B. (D.J. MacLeod).

YELLOW EDGE (virus) was a trace in two fields of Senator Dunlap in Queens Co., N.B. (D.J. MacLeod).

JUNE YELLOWS (genetic breakdown) affected 15% of Premier, with some stunting, in a new plantation in Lincoln Co., Ont., set with plants from Waterford. About 10% of the plants in six other fields were affected (G.C. Chamberlain). An entire plantation of Premier in Queens Co., N.B., showed this condition on 16 June, but the symptoms disappeared later (D.J. MacLeod). Plantings of Premier in Kings and Annapolis Co., N.S., showed 50-100% of plants affected, except the Lowden strain, which was free from any symptoms (J.F. Hockey).

ROOT ROT (cause unknown) occurred extensively on Premier in southern Ont., in plantings with poor natural drainage. Heavy rain and poor growing conditions in May aggravated the injury. The failure of 25,000 plants to become established in one field was ascribed to this disease. In three other plantings root rot was confined to poorly drained areas (G.C. Chamberlain).