IV. DISEASES OF FRUIT CROPS

APPLE

CROWN GALL (Agrobacterium tumefaciens; cf. p. 27). Galls were seen on a number of young trees received for planting at Ste. Anne de la Pocatiere, Que. (C. Perrault)

STORAGE ROT (Alternaria Mali) was found in Gravensteins in cold storage in Quebec, Que. (A. Payette)

CORE ROT (Alternaria sp.). Over 60% of Cortland apples in a box from Nicolet, Que., had a slight heart rot from which Alternaria sp. was isolated. The fungus seems to be a weak parasite that may have penetrated soon after blossoming. A similar trouble has previously been seen to a small extent in other varieties. (C. Perrault)

LEAF SPOT (Botrytis sp.). Spots were found on leaves in the Okanagan Valley, B.C., where blossom parts had lodged during prolonged wet weather. (R.E. Fitzpatrick)

FRUIT ROT (Botrytis cinerea) was found in cold-stored Wealthy at Ile-aux-Coudres, Que. (A. Payette). It was prevalent in fallen Dudley at Burton, N.B. in September. (S.F. Clarkson)

BLOSSOM BLIGHT (Cladosporium herbarum). Seventy per cent of blossoms near Cape Blomidon, N.S. failed to set fruit and were covered by this fungus. The blossom period was rainy and humid. (J.F. Hockey)

TWIG BLIGHT (Cytospora sp.) slightly affected a few young McIntosh trees at the Station, Fredericton, N.B. (S.F. Clarkson)

FIRE BLIGHT (Erwinia amylovora). Severe damage occurred in the orchard at the Station, Lethbridge, Alta., and many infected trees were removed and destroyed (M.W. Cormack). Heavy infection occurred on several seedlings in the selection block, University Gardens, Saskatoon, Sask. (R.C. Russell). Severe infection occurred on several varieties at Morden, Man., though the disease was less severe than in 1941 (W.L. Gordon). A specimen was received from Braeside, Ont. (H.N. Racicot). In November an orchard of Greening and Wagener at East Flamboro, Ont., was found to have widespread twig blight and many cankers; the orchard was close to an apiary (G.C. Chamberlain). In Que. fire blight was not severe in improved orchards generally; but untended trees in gardens, and along roadsides were heavily infected, notably on Ile d'Orleans and between Beaumont and Ste. Anne de la Pocatiere. (C. Perrault, R.O. Lachance, L.J.S. Laporte, O.Caron)

ROT (Fusarium sp.) was severe in a number of McIntosh fruits in Aug. at Springhill, N.B. (S.F. Clarkson)

ROT (Gloeosporium album) was found on Northern Spy from York Co., N.B. (S.F. Clarkson)

RUST (Gymnosporangium clavipes) lightly infected McIntosh, Cortland and Delicious at St. Catharines, Ont. (G.C. Chamberlain). A trace was found on Yellow Transparent, Alexander and Burgess crab in Kamouraska Co., Que. (C. Perrault, R.O. Lachance)

ANTHRACNOSE (Neofabraea malicorticis) was reported as severe on Lowland Raspberry; moderate on Grimes Golden, Spitzenburg, and Cox Orange; slight on Sandow, Goal, Rupert, Red Delicious; trace on Lubsk Queen and Delicious in coastal B.C. The disease is fairly common in neglected orchards (W. Jones). In the Okanagan Valley, B.C., anthracnose varies in severity with seasonal conditions; its occurrence was about normal this year. (H.R. McLarty)

PERENNIAL CANKER (Neofabraea perennans) is prevalent throughout the Okanagan district, B.C. but losses have been greatly reduced since the introduction of the woolly aphis parasite, Aphelinus wali. (H.R. McLarty)

BULL'S EYE ROT (Neofabraea malicorticis or N. perennans) was found damaging fruit injured by arsenical sprays, but was not serious in the Okanagan district, B.C. (H.R. McLarty)

STORAGE ROT (Penicillium sp.) affected a large percentage of a shipment of Northwest Greening from Prince Edward county, Ont. In some cases infection had occurred through wounds, but in others, no wounds were visible (H.N. Racicot). P. expansum was isolated from Gravensteins rotting in cold storage in Quebec, Que. (A. Payette)

FROG EYE SPOT (Phyllosticta limitata) was conspicuous, but not serious on McIntosh and Fameuse in a Northumberland Co., Ont., orchard. (G.C. Chamberlain)

LEAF SPOT (Physalospora obtusa) was moderately abundant on some trees at Morden, Man. (W.L. Gordon)

TWIG BLIGHT (Physalospora obtusa) severely damaged a few young McIntosh trees at the Experimental Station, Fredericton, N.B. (S.F. Clarkson, I.L. Conners)

CROWN ROT (Phytophthora Cactorum). It is estimated that at least 2% of the trees in the Okanagan Valley, B.C., are affected by crown rot. The incidence of the disease does not vary greatly from year to year, and no serious new outbreaks are reported this year. (R.E. Fitzpatrick). M.F. Welsh (Can. Journ. Res. C, 20:457-490, 1942) describes crown rot as it occurs in the irrigated orchards of B.C. It is confined to the bark below ground level and attacks trees of all ages and of all commercial varieties. Proof is given that Phytophthora Cactorum (L. & C.) Schroet. is the causal organism. Isolation of the pathogen is possible only from the margins of active lesions; secondary organisms seem to suppress it in rotted tissues.

POWDERY MILDEW (Podosphaera leucotricha) was common in garden orchards on Vancouver Island, and the lower mainland, B.C. Gravenstein, Grimes Golden, Jonathan, Cox Orange and King seemed to be most susceptible (W. Jones). Mildew was widespread in the Okanagan Valley, B.C. on foliage, but did little damage to fruit; it was occasionally severe enough on Jonathan foliage to

reduce the crop (R.E. Fitzpatrick). In Lincoln Co., Ont., the disease was seen on unsprayed Cortland trees and caused some twig stunting. (G.C. Chamberlain). In Rouville, Deux-Montagnes, and Brome counties, Que., mildew was serious in about 60% of the nurseries, but was not seen on orchard trees. (L.J.S. Laporte)

BRANCH ROT (Schizophyllum commune) slightly damaged a few crabapple trees at Edmonton, Alta. (M.W. Cormack)

BROWN ROT (Sclerotinia fructicola) caused slight decay of McIntosh in Lincoln Co., Ont., following scab or mechanical injury (G.C. Chamberlain). The organism was also isolated from cold-stored apples grown at Frelighsburg, Que. (A. Payette)

SILVER LEAF (Stereum purpureum). A trace was found on Hibernal at Lacombe, Alta. (M.W. Cormack). In N.B. the leaves of a number of Cortland trees in York Co. were completely affected, and those of a few McIntosh were slightly affected; cankers were not found (S.F. Clarkson). One tree of Biship Pippin in Kings Co., P.E.I. was completely affected. (R.R. Hurst)

SCAB (Venturia inaequalis) was common on Vancouver Island and the lower mainland, B.C., causing slight to moderate damage (W. Jones). It was prevalent in the Grand Forks area, where it is generally of minor importance, and caused heavy losses in fruit infection and defoliation; heavy prolonged spring rains were probably responsible. In the Salmon Arm region, the disease was exceptionally severe, especially on McIntosh Red, which, in some orchards was not picked because of the heavy damage; extremely wet spring weather disrupted the spray schedule (G.E. Woolliams). In Sask. a trace of scab was found in the University Garden, Saskatoon, (B.J. Sallans). Specimens and a report from Struan indicate fairly heavy infection on several varieties of crab (R.C. Russell, T.C. Vanterpool). A specimen was also received from Vibank (L.T. Richardson). A trace to slight infection on leaves and fruit is reported from Morden, Man., and moderate to heavy leaf infection, with occasional fruit spots, is reported in the University Garden, Winnipeg. (W.L. Gordon)

Scab was unusually serious in southwestern Ont. Mature ascospores were found on April 21 at St. Catharines, but dry weather delayed the initial discharge until May 4. The major discharge period was May 12-19; as full bloom was about May 15, considerable infection took place before the calyx spray could be applied. Primary infections appeared May 25. No ascospore discharge occurred from leaves sprayed with ½% Elgetol. In trees sprayed according to the calendar infection was 2-13%; in unsprayed trees it was 100%. McIntosh, Melba, Cortland and Fameuse were most severely attacked (G.C. Chamberlain, J.E. Howitt). McIntosh received from Carleton Co. on Dec. 1, showed late infections around the stem, which probably developed in storage. (H.N. Racicot)

In southwestern Que. scab caused little damage in well-sprayed orchards. Early in the season extra sprays had to be applied in southern districts because of continued rain. Some pinhead scab developed in August in orchards where lime sulphur had not been included in the apple maggot

sprays (L.J.S. Laporte). Scab was easily controlled along the lower St. Lawrence, owing to dry weather, but few apples escaped infection in unsprayed orchards. (C. Perrault, O. Caron)

In N.B. warm weather hastened tree development and resulted in early blossoming. Mature ascospores were found May 5 in the St. John River Valley. Initial ascospore discharge occurred on May 22. The critical period of spore discharge was May 23-26, during full bloom. Primary infections were recorded June 12 in York Co. and June 15 in Sunbury Co. Trees with heavy primary infection did not develop secondary infection until late in the season, owing to dry weather. (S.F. Clarkson)

The spring was about 2 weeks in advance of 1941 in the Annapolis Valley, N.S. Heavy ascospore discharges occurred May 8-9, May 16, and May 24-25, causing heavy infection in unsprayed orchards. The early season was favourable for spraying and good scab control was obtained in well-sprayed orchards. Ascospore discharge continued until June 22. (J.F. Hockey)

Ascospore discharge was heavy from June 2 onward in P.E.I. Scab was not serious in most of the larger orchards, where the full spray schedule was followed, although up to 25% leaf infection was observed. Fruit infection was severe in some small orchards and one grower suffered serious losses from scab on McIntosh Red. (R.R. Hurst)

MOSAIC (virus). A mosaic-like mottle was common on Bethel, in York, Sunbury and Carleton counties, N.B., but its cause is uncertain (D.J. MacLeod). A slight spread of mosaic occurred in orchards under observation in N.S. The crop was light on most affected trees and defoliation was appreciably hastened (J.F.Hockey). One affected McIntosh tree was seen near Charlottetown, P.E.I. (R.R.Hurst)

BITTER PIT (non-parasitic). A slight amount was seen on Northern Spy and Cox Orange at the Sidney Station, B.C. (W. Jones). Baxter, Wolfe River, and Northern Spy were severely affected in York Co., N.B. (J.L. Howatt). The disease was general in N.S.; up to 50% of the fruit were affected on some trees; conspicuous in Cox Orange, Northern Spy, Stark, Baldwin; also seen in Gravenstein, Blenheim, Ribston. (J.F. Hockey)

DROUGHT SPOT, CORKY CORE and DIE BACK (boron deficiency). "These troubles on apples in B.C. are now rarely encountered" (H.R. McLarty). Slight drought spot and corky core occurred at St. Joseph du Lac, Que., particularly on summer varieties, but to some extent on McIntosh (L.J.S. Laporte). Up to 100% Fameuse showed drought spot and up to 100% McIntosh showed corky core in part of the orchard at Macdonald College, Que; the season was abnormally dry (J.G. Coulson). Drought spot was severe on Cortland in York, Sunbury and Queens counties, N.B.; pitting occurred in the orchard and cork developed in storage; it is suggested that Cortland may serve as an indicator for boron-deficient soils. An abnormal type of cork caused slight damage to McIntosh in York Co.; a single sunken spot 3/8 inches diam. with cork beneath it was seen on each apple (S.F. Clarkson). Corky core affected up to 80% of some lots of Gravenstein and McIntosh in N.S. Drought spot symptoms were also seen on Northern Spy. This was the most severe outbreak ever experienced in N.S. (J.F. Hockey)

FLAT LIMB (scion-stock incompatibility) caused some breaking of limbs in bearing trees in N.S. It has been observed that young trees propagated by budding show practically no flat limb, in contrast to those propagated by scion grafts. (J.F. Hockey)

LEAF SCORCH (cause unknown). The situation in the Okanagan Valley, B.C., was similar to 1941; the disease was present but caused no serious damage. It has not responded to treatments of copper, iron, magnesium, manganese, sulphur and zinc. (R.E. Fitzpatrick)

SPRAY INJURY. Arsenical codling-moth sprays caused considerable damage in some orchards in the southern Okanagan Valley, B.C. Poor air drainage and wet weather seem to have been contributing factors. (R.E. Fitzpatrick)

STORAGE BREAKDOWN. A breakdown of the flesh of McIntosh apples from Carleton Co., Ont. was observed on December 1; the breakdown was mainly near the stem (H.N. Racicot). A lot of Spy and Russet, shipped from N.S. on December 19 and examined in Ottawa, December 30 showed senile breakdown; the fruits were over-mature; no organism was associated with the breakdown, which affected 3% of the Russet and 14% of the Spy. (H.N. Racicot)

WATER-CORE (non-parasitic) slightly affected King and Winter Banana varieties at Sidney Experimental Station, B.C. (W. Jones)

POTASH INJURY. Despite indication that ground sprays of muriated potash would not control ascospore development, a Sunbury, N.B., grower insisted that a muriate of potash spray plot be included with the scab control trials being run in his orchard. Sprays applied were: (1) delayed dormant ground cover of 50 lb. muriate of potash in 100 gal. water at 180 gal. per acre: (2) Prepink, muriate of potash 10 lb. in 100 gal. water; (3) Calyx, lime sulphur and iron sulphate; (4) 1st. cover, muriate of potash 10 lb. in 100 gal. water; (5) 2nd. cover, muriate of potash 10 lb. in 100 gal. water. Twig growth was stunted, foliage was sparse and leaves small or with severe marginal burning; 86% of the fruit was severely scabbed and only 2.3% entirely clean. (S.F. Clarkson)

APRICOT

CORYNEUM SPOT (C. Beijerinckii) was present in a few orchards in the Okanagan Valley, B.C., but is not an important factor. A considerable amount of leaf spotting caused by arsenical sprays has been attributed by growers to this disease. (H.R. McLarty)

POWDERY MILDEW (Podosphaera Oxyacanthae) occurred on several trees in the Laboratory orchard, Summerland, B.C. (G.E. Woolliams)

BLUEBERRY

RED LEAF (Exobasidium Vaccinii) A survey of blueberry barrens in Yarmouth Co., N.S. revealed 2-5% infection. The disease is prevalent and destructive in certain clones. (R.M. Lewis)

BOYSENBERRY

LEAF SPOT (Mycosphaerella Rubi) was general on Vancouver Island and the lower mainland, B.C., causing slight to moderate damage. (W. Jones)

CHERRY

BLACK KNOT (Dibotryon morbosum) was general along the lower St. Lawrence, Que., infection being aggravated by the presence of wild hosts. (O. Caron). It was widespread in P.E.I., causing slight to very severe damage. (R.R. Hurst)

LEAF SPOT (Higginsia hiemalis) was general in North Saanich Co., B.C., on wild cherry, Prunus emarginata, providing a possible source of infection for cultivated trees (W. Jones). Leaf spot was serious in southern Ont., especially on sour cherries; one orchard that received no fungicidal spray was defoliated by July 4 and the crop was unsaleable; many orchards were 75% defoliated early in August; properly sprayed orchards were not seriously affected until after the spray schedule had been completed (G.C. Chamberlain). Moderate infection was seen in one locality in P.E.I., but the disease was not generally troublesome. (R.R. Hurst)

POWDERY MILDEW (Podosphaera Oxyacanthae) was widespread in Lincoln Co., Ont., overrunning the vigorous new growth of young trees and causing stunting and leaf distortion, but not causing general damage (G.C. Chamberlain). A specimen was also received from Wallaceburg, Ont. (L.T. Richardson)

BROWN ROT (Sclerotinia fructicola) caused slight damage in a few orchards in the lower mainland, B.C. (W. Jones). It was identified on Compass cherries from Brandon, Man. (L.T. Richardson). Brown rot was found in unsprayed sweet cherries from Annapolis Royal, N.S. (J.F. Hockey). It seriously injured sweet cherries in P.E. I. despite thorough spraying. (R.R. Hurst)

BLOSSOM and TWIG BLIGHT (Sclerotinia laxa Aderh. & Ruhl., and S. fructicola) was common in Vancouver Island and the lower mainland, B.C. "In isolations made from cherry twigs and flower pedicels in four orchards in the Fraser Valley, Sclerotinia laxa only was isolated. No S. fructicola was present. S. fructicola however, was isolated from one sample of Weeping Japanese Cherry."(W. Jones). Blossom blight was prevalent at Saanichton owing, apparently, to the late spring. Sour cherries have proved more susceptible than sweet ones. The removal of sour cherries interplanted with sweet cherries in one orchard has lowered the incidence of disease in the latter (W. Newton). S. fructicola blighted 10-20% of blossoms in several orchards in Lincoln Co., Ont.; in some cases rot of the green fruit occurred where the calyx adhered to it (G.C. Chamberlain). See G.A. Huber and K. Bauer (Phytopath. 31:718-731. 1941) for a discussion of the occurrence of these organisms on the Pacific Coast.

LEAF CURL (Taphrina sp.) severely affected five young trees in one cherry planting in the Okanagan Valley, B.C. (R.E. Fitzpatrick)

NECROTIC LEAF SPOT (?virus) affected 22% of Montmorency sour cherries in four Lincoln Co., Ont., orchards; it causes delayed foliation, necrotic

spotting of leaves, and drop; the trees recover and appear normal by the end of June, except for thin foliage. (R.S. Willison, G.C. Chamberlain)

TATTER LEAF (?virus). No spread found beyond two orchards in which the disease was found in 1941 on Black Tartarian sweet cherries. It has been transmitted by budding to Windsor and Black Tartarian, causing brown spotting and laceration of leaves. Peach, on inoculation, shows a mild mottle late in the season and sometimes a red pin-point spotting. (R.S. Willison)

YELLOWS (?virus). This disease was formerly thought to be physiological, but in 1941 buds from diseased trees were found to transmit it to healthy seedlings. Further transmission experiments are in progress using buds from different orchards. Yellows has been found on Montmorency and Richmond sour cherries in about twenty orchards in Lincoln and Welland counties, Ont. Counts made in nine orchards showed 19-40% of the trees affected. (G.C. Chamberlain)

VIRUS DISEASES in the Okanagan Valley, B.C. No marked changes in the cherry virus situation were seen this year. (T.B. Lott)

CRINKLE (bud sport). No change is observable in the Okanagan Valley, B.C. (T.B. Lott)

FRUIT PITTING (probably frost injury) affected 30-50% of Richmond sour cherries in Lincoln Co., Ont. This variety, which matures earlier than others, was noticeably pitted, with internal breakdown below the skin. The trouble is thought to be due to low temperatures just after setting of the fruit. (G.C. Chamberlain)

GUMMOSIS, apparently following mechanical injury, was seen in one tree in P.E.I. (R.R. Hurst)

HEAT SCALD. Where the picking of sour cherries had not been completed by July 18 in the St. Catharines district, Ont., 50-75% of the crop was lost through severe scalding. Brown rot followed this injury. (G.C. Chamberlain)

NITER BURN. In a 2-year-old orchard of Montmorency sour cherries in Welland Co., Ont., where cyanamid was applied at the rate of ½ lb. per tree, the leaves turned orange-yellow with marginal burning and later dropped. Fifty per cent of the trees were affected. (G.C. Chamberlain)

SPRAY INJURY. Thirty per cent defoliation occurred in one orchard of Montmorency sour cherries in Lincoln Co., Ont., due to copper injury from Bordeaux sprays. Slight injury was evident anywhere in Lincoln and Wentworth counties, where Bordeaux had been used. Fixed copper sprays produced no apparent injury. (G.C. Chamberlain, C.B. Kelly)

YELLOW FOLIAGE, due to wet soil conditions, was general on sweet cherries throughout Lincoln, Welland and Wentworth Counties, Ont., wherever soil drainage was poor. Many trees or branches died later in the season. (C.B. Kelly)

CRANBERRY

LEAF BLIGHT (Naevia Oxycocci). A bog in Kent Co., N.B. that was severely affected in 1941 showed only slight growth and practically no bloom with 100% infection in 1942. As a result the bog has been overrun by sedges and water birch. (S.F. Clarkson)

CURRANT

WHITE PINE BLISTER RUST (Cronartium ribicola). Red currants at L'Assomption, Que., showed 10% infection and black currants 50%. (L.T. Richardson). Blister rust caused early defoliation of black currants on Ile d'Orleans, Que. (C. Perrault). In contrast to 1941, the disease was not common in P.E.I. in 1942. (R.R. Hurst)

SEPTORIA LEAF SPOT (Mycosphaerella Grossulariae) was severe in the University Gardens, Saskatoon, and at Indian Head, Sask. (H.W. Mead). Severe infection caused defoliation of all types of currant at Morden, Man. (W.L. Gordon). This disease was widespread and caused some defoliation of Boskop at Goderich, Ont. (G.C. Chamberlain)

CLUSTER CUP RUST (Puccinia Pringsheimiana) was general on Boskop at Goderich, Ont., causing almost complete defoliation. (G.C. Chamberlain)

POWDERY MILDEW (Sphaerotheca mors-uvae) was recorded on black currants at Cookson and Saskatoon, Sask. (H.W. Mead). There was a moderate infection on all types at Morden, Man. (W.L. Gordon)

REVERSION (virus). Leaves were collected from an unfruitful 7-acre field near Armstrong,B.C. Counts of virus from the central leaf lobes indicated that the trouble was due to reversion. (H.R. McLarty)

GOOSEBERRY

ANTHRACNOSE (Gloeosporium Ribis f. sp. Grossulariae) was general and severe at Morden, Man. (W.L. Gordon)

SEPTORIA LEAF SPOT (Mycosphaerella Grossulariae) was severe at Cookson, Indian Head and Saskatoon, Sask. (H.W. Mead). A slight infection was present at Morden, Man. (W.L. Gordon)

POWDERY MILDEW (Sphaerotheca mors-uvae). In the variety plots at Summerland, B.C., powdery mildew was severe on Poorman, slight on Oregon Champion, and absent from Newton and Pixwell (G.E. Woolliams). A trace of the disease was found in a few gardens in P.E.I.; much less than in 1941. (R.R. Hurst)

GRAPE

BLUE MOULD (Penicillium sp.) was severe in imported baskets of grapes received in P.E.I. (R.R. Hurst)

POWDERY MILDEW (Uncinula necator) caused slight damage in a few gardens on Vancouver Island (W. Jones). Mildew was severe in the Experimental Station vineyard, Summerland, B.C., but was absent from vineyards in the Osoyoos area, where it was serious in 1941 (H.R. McLarty). Specimens were received from Brockville, Ont., (L.T. Richardson) and Campbellford. (H. N. Racicot)

LOGANBERRY

SEPTORIA LEAF SPOT (Mycosphaerella Rubi) was general and caused moderate damage on Vancouver Island and the lower mainland, B.C. (W. Jones)

PEACH

BROWN ROT (Sclerotinia fructicola). Brown rot apothecia were abundant in uncultivated orchards at St. Catharines, Ont. In an experimental application of powdered cyanamid, the apothecia were destroyed and no spore discharge was recorded (G.H. Berkeley). Slight blossom and twig blight injury occurred on Elberta in Lincoln Co. (G.C. Chamberlain). The moist season throughout southern Ontario resulted in considerable losses from brown rot. Among the early varieties, Yellow Swan and Rochester were most severely attacked; rain just before and high humidity during the harvest resulted in late infections. Mid-season varieties suffered most in late sections where harvesting took place at the end of August. Rain, heat, and high humidity prevailed again during the Elberta harvest, and much rot developed over night in picked fruit. Less damage resulted where the full spray schedule had been followed, but many growers do not use the complete schedule (R.S. Willison, C.B. Kelly). From a trace to 100% infection occurred in many lots of peaches imported into P.E.I. (R.R. Hurst)

POWDERY MILDEW (Sphaerotheca pannosa) was present in the Okanagan Valley, B.C., but caused little damage (R.E. Fitzpatrick). It was prevalent on Golden Jubilee in Lincoln Co., Ont., but only slightly marked some fruit. (G.C. Chamberlain)

LEAF CURL (Taphrina deformans) was present in the Okanagan Valley, B.C., but caused no significant damage (R.E. Fitzpatrick). There was little or no leaf curl in the Niagara Peninsula despite high humidity during leaf expansion; high temperature hastened leaf development and there was little rain between April 11 and May 3 (R.S. Willison). It was severe on unsprayed trees in Ont. (J.E. Howitt). A few trees at Shediac, N.B. were badly affected. (J.L. Howatt)

WILT (Verticillium sp.). Marked wilting and leaf drop occurred in scattered trees of a 2-year-old Elberta block in Lincoln Co., Ont. The disease was also seen in several other young orchards. Where soil fertility was good the trees made fair recovery (G.C. Chamberlain). One orchard of 2-year-old peach seedlings in the Niagara Peninsula had 60% of the trees infected and 30% killed (C.D. McKeen). C.D. McKeen (Can. Jour. Res. C.21: 95-117, 1943) indicates that the fungus is referable to V. albo-atrum; he shows that in the Niagara Peninsula, soil moisture is generally below optimum by the time that soil temperature is high enough to favour the disease.

BACTERIAL BLIGHT (Xanthomonas pruni (E.F. Sm.) Dowson, Zentralbl. f. Bakt. U.S.W. Abt. 2, 100:191. 1939; Pseudomonas pruni E.F. Smith, Science n.s. 17:456. 1903; Starr & Burkh. Phytopath. 32:600. 1942) was of considerable importance in Lincoln Co., Ont., particularly in orchards adjacent to Lake Ontario. An orchard in Louth first showed symptoms about July 3, after the owner had applied three sprays containing zinc sulphate. By mid-August the trees nearest the lake were seriously defoliated and even those furthest from it showed some infection. In 1941 infection did not spread as far from the lake. The disease showed in decreasing severity on Elberta, Golden Jubilee, Vedette and Valiant. Numerous lesions occurred on fruit and young bark. In an orchard in Clinton there was severe damage in the first two or three rows from the lake and very slight infection ten rows back (C.B. Kelly). A similar downward gradation of infection away from the lake was seen in many other Lincoln Co. orchards; this effect is attributed to the added moisture from the lake fogs (C.B. Kelly, G.C. Chamberlain). Several seedlings at the Vineland Station were moderately defoliated by the disease; bacteria were found in spots on the fruit; branch lesions were not numerous (C.B. Kelly). A small orchard of Halehaven on the lakeshore at Beamsville, was seriously infected with fruit spotting and partial defoliation. (C.D. McKeen)

LITTLE PEACH (virus). One hundred and seventy-eight trees in the Niagara Peninsula, Ont., were marked for removal in 1942, compared with 406 in 1941. (C.B. Kelly)

WESTERN X DISEASE (virus). A survey of orchards in the Okanagan Valley, B.C., first mapped in 1940, shows that this disease is increasing in the southern districts; the results of the survey for the last three years are given in the following table:

Southern Districts	1940	1941	1942
Total trees	3,717	3,764	3,348
Diseased trees	67 (total)	41 (new)	28 (new)
% Diseased	1.8 "	1.1 "	0.8 "
Northern Districts			
Total trees	261	259	259
Diseased trees	2 (total)	0 (new)	0 (new)
% Diseased	0.4 "	0 "	0 "
All Districts			
Total trees	3,978	4,023	3,607
Diseased trees	69 (total)	41 (new)	28 (new)
% Diseased	1.7 "	1.0 "	0.8 "

In some diseased trees the symptoms are so slight that they are not readily detected. For example, one tree showed the disease in 1940, failed to show definite symptoms in any of eleven examinations in 1941, and showed the disease again in 1942. In general, symptoms were about as in 1941, but less marked than in 1940 (T.B. Lott). For discussion and illustrations of this and other West Coast diseases, see E.L. Reeves, Virus Diseases of Fruit Trees in Washington, Wash. State Dept. of Agr. Bull. 1, 1943.

X DISEASE (virus). Since the last P.D.S. Report was issued, further data have been received on X disease in the Niagara Peninsula, Ont., in 1941. The disease had evidently been present, but unrecognized, for a considerable time before 1941; for in that year it was found in Clinton, North Grimsby, Niagara, Saltfleet and Stoney Creek, a total of 844 trees being marked for removal in Clinton, Saltfleet and Stoney Creek (C.B. Kelly). Complete figues are not available for Niagara, but 68 diseased trees were found in 6 orchards placed under annual survey and plotting. The outstanding observation from these 6 orchards is the lack of correlation between diseased peaches and proximity to diseased or healthy chokecherry. One orchard, with no chokecherries or other peach trees close to it, had a single diseased tree at its centre. Another had a diseased chokecherry at the N.W. corner, a diseased peach in the centre and a second diseased peach at the S.E. corner. There is evidence of spread from peach to peach and over considerable distances (R.S. Willison, G.C. Chamberlain). In 1941 surveys, a number of orchards were seen with diseased trees that definitely were not within 500 ft. of chokecherries (C.B. Kelly). Most clumps of chokecherry along the highway near Brighton and Port Hope were affected and many dead bushes were seen. (G.C. Chamberlain)

YELLOWS (virus) was about as plentiful in the Niagara Peninsula, Ont., as in 1941, approximately 200 trees being marked for removal. (C.B. Kelly)

PRUNE DWARF (virus) is suspected as the cause of a disease of peach in the Okanagan Valley, B.C. The rate of infection for the district is low, but for a few orchards it is as high as 50%. No more affected prunes have been found. (T.B. Lott)

SPRAY INJURY. Severe injury resulted from the use of arsenical sprays in the Okanagan Valley; however, as they were not widely used, the total damage was slight. It has been noted that persistent use of arsenical sprays causes a cankered condition of the limbs (H.R. McLarty). In Lincoln Co., Ont., shot hole and foliage drop of Rochester resulted from the application of a sulphur and arsenic dust followed by a prolonged wet spell. (G.C. Chamberlain)

INTERNAL BROWNING (cause unknown). Breakdown and internal browning of the flesh around the pit rendered 20% of the crop of an orchard of Veteran in Lincoln Co., Ont., worthless. No manure or fertilizer had been applied for several years, and the fertility level combined with high temperature and humidity during ripening may have been responsible. (R.S. Willison)

WINTER INJURY. A survey of eight peach orchards in various parts of Essex Co., Ont., indicated widespread damage to buds during cold weather in February, 1943. Buds on the lower limbs and on trees with damaged trunks or limbs suffered most injury. The variety Hale appeared to be most seriously affected, all fruit buds in one orchard appearing to be dead. In one large orchard 60% of the buds on Early Elberta and 40% of those on the "V" varieties were killed or severely injured; Late Elberta was much less severely affected. (L.W. Koch)

PEAR

FIRE BLIGHT (Erwinia amylovora) broke out in a few orchards in the Okanagan Valley, B.C., but in general it was no more prevalent than usual

(G.E. Woolliams). Scattered infections were found on Bartlett in 5 orchards in Lincoln Co., Ont. One Kieffer orchard in Lincoln Co. showed infection on 7% of trees with a number of extensive trunk cankers; cultivation of the orchard, with stimulation of growth, may have increased the susceptibility of this relatively resistant variety. (G.C. Chamberlain)

LEAF SPOT (Mycosphaerella sentina) slightly infected Bartlett at Goderich, Ont. (G.C. Chamberlain)

POWDERY MILDEW (Podosphaera leucotricha). Considerable infection occurred on unsprayed trees in the Okanagan Valley, B.C., but spraying for mildew is becoming general and sprayed trees suffered little damage. (R. E. Fitzpatrick)

SCAB (Venturia pyrina) was slight on foliage of Anjou and Clairgeau, and moderate on fruit of Anjou at Sidney, B.C. (W. Jones). It was more prevalent than usual in the Salmon Arm district (G.E. Woolliams). A single Flemish Beauty in a Bartlett block in Lincoln Co., Ont. had many extensive lesions on 2- and 3-year-old wood (G.C. Chamberlain). Owing to the dry season little scab developed at Ste. Anne de la Pocatiere, Que. (C. Perrault). In P.E.I. the disease was moderate to severe on Flemish Beauty and slight to severe on other varieties. (R.R. Hurst)

STONY PIT (virus) was present in approximately 40% of Bosc and 12% of Anjou at the Sidney Station, B.C. In Bosc the foliage was harsh and rolled. (W. Jones)

BLACK END (cause unknown) was present to some extent in most plantings in the Okanagan Valley, B.C. (R.E. Fitzpatrick)

PLUM

SCAB (Cladosporium carpophilum). One specimen was received from Dorchester Co., Que. (H.N. Racicot)

SHOT HOLE (Cercospora circumscissa) was severe on Opata and some other plums at Brandon, Man. This is the first record of this fungus in Man. (W.L. Gordon)

LEAF SPOT (Cylindrosporium Pruni) was severe in one orchard in Lincoln Co., Ont., causing defoliation of German Prune. (G.C. Chamberlain)

BLACK KNOT (Dibotryon morbosum) was prevalent on unsprayed trees in Ont. (J.E. Howitt). It was general in the lower St. Lawrence valley (O.Caron), and in P.E.I. (R.R. Hurst)

SHOT HOLE (Higginsia prunophorae) was reported from St. Hubert Mission, Sask. (L.T. Richardson). It was more severe than usual at Saskatoon. (T.C. Vanterpool)

PHYLLOSTICTA LEAF SPOT (Phyllosticta circumcissa) was very severe on some trees at Morden, Man. (W.L. Gordon)

BROWN ROT (Sclerotinia fructicola) caused very slight damage on a few trees at the Station, Sidney, B.C. (W. Jones). It caused considerable drop at Webb, Sask. (T.C. Vanterpool). Trials in the laboratory orchard, St. Catharines, Ont. gave the following results:

Variety	Rate of Infection	
	Unsprayed	Sprayed
Lombard	16%	1-4%
Imperial Gage	12	4-7
Monarch	15	1-6
Reine Claude	9	5-6
Yellow Egg	18	2-5
Imperial Epineuse	11	3-5
German Prune	17	2-4
Italian Prune	10	0-3

(G.C. Chamberlain)

Brown rot destroyed the complete crop of three trees at Sturgeon Falls, Ont.; a specimen was also received from Dorchester Co., Que. (H.N. Racicot). It was common in unsprayed orchards in Que. (O. Caron). Up to 5% of plums in stores at Fredericton, N.B. were affected (S.F. Clarkson). The disease was prevalent in P.E.I., but less serious than in 1941; careful control measures gave smaller losses in the main orchards. (R.R. Hurst)

BLOSSOM and TWIG BLIGHT (Sclerotinia laxa). At the Station, Sidney, B.C., this trouble was very severe on Shropshire Damson; severe on Michelson, Peach, English Damson, Grand Duke, Date Prune; slight on Santa Rosa, Maynard, Early Gold. Isolations from twigs and pedicels of Reine Claude, Gold and Opata, moderately damaged in Sardis and Vancouver nurseries, also yielded this species. (W. Jones)

PLUM POCKET (Taphrina communis) was reported from Dahinda, and destroyed the entire crop of a block of 13 trees at Weyburn, Sask. (T.C. Vanterpool). The disease was also reported from Saskatoon and Marquis (R.J. Ledingham). Infection was moderate at Brandon, and severe at Morden and Winnipeg, Man. (W.L. Gordon). It was injurious in the Ottawa valley, Que. (O. Caron). A moderate infection occurred in a few trees at Riviere du Loup (C. Perrault), and moderate to severe infection was recorded from Prince Co., P.E.I. (R.R. Hurst)

PRUNE DWARF (Prunus virus 6) has been found in 4 orchards in Ont., no new ones having been added this year. In all these orchards it has occurred on Italian Prune top-worked on Damson. Some plums appear to be immune; the use of these as intermediate stocks is being investigated. (R.S. Willison)

SHIRO LINE-PATTERN MOSAIC (virus). No new cases were observed in commercial orchards in Ont. Inoculated Reine Claude and Italian Prune showed mild oak leaf patterns for the second year in succession; Early Golden and certain Myrobolan seedlings were symptomless; other Myrobolan seedlings showed striking white vein-banding. (R.S. Willison)

LITTLE PLUM (Little peach virus). Eight trees were marked for removal in the Niagara Peninsula, Ont., compared with 39 in 1941 (C.B. Kelly). This is the first report of the little peach virus on plum in the Survey. (I.L. Conners)

VARIEGATION (?virus). In 1941 an Italian Prune tree in Lincoln Co., Ont., partly top-worked with apricot, had a number of variegated leaves. Prune buds from this tree were inserted in a single peach tree in August, 1941. In May, 1942, the inoculated branch, and a strip of bark below it to ground level or lower, died; some early leaves were mottled and ring-spotted; later foliage was more nearly normal, but the fruit was flattened and distorted. This trouble looks like another virus disease, evidently masked in apricot. It was included in the 1942 host range trials. (R.S. Willison)

LEAF SPOT (cause unknown). A severe spotting has been noted for the past two years on leaves of prune in certain districts in the Okanagan Valley, B.C. (R.E. Fitzpatrick)

RUSSETTING (cause unknown) marred much of the fruit in Lincoln Co., Ont.; Yellow Egg (5-50% fruit affected) and Imperial Epineuse (8-50% affected) suffered most; possibly associated with mechanical abrasions (G.C. Chamberlain). Plums received from Bolton Centre, Que., showed corky, raised, pin-point spots of unknown origin; perhaps associated with cool, wet weather early in the season. (H.N. Racicot)

SPRAY INJURY. Shot-holing and considerable leaf-drop were noted on Burbank in Lincoln Co., Ont., following sprays of Bordeaux mixture. (G.C. Chamberlain)

QUINCE

LEAF BLIGHT (Fabraea maculata) caused moderate damage to a few trees at Agassiz, B.C. (W. Jones)

RUST (Gymnosporangium clavipes). Fruit bearing aecia were received from Simcoe, Ont. (J.D. MacLachlan)

RASPBERRY

CROWN GALL (Agrobacterium tumefaciens; c.f. p. 27). Twelve cases were reported in P.E.I. on Viking and other varieties. (R.R. Hurst)

BLIGHT (Botrytis cinerea). This fungus was found fruiting freely on the turions of the seedling O 276 at Truro, N.S., associated with symptoms resembling cane blight. (J.F. Hockey)

SPUR BLIGHT (Didymella applanata). A slight infection occurred on several varieties at Lacombe, Alta. (M.W. Cormack). Spur blight caused very severe damage to canes in a garden in Saskatoon, Sask. (T.C. Vanterpool). It caused moderate damage at Pontrilas (R.C. Russell). Canes in Winnipeg, Man. showed moderate infection (W.L. Gordon). A 2% infection was recorded on Star-light at St. Norbert, and 5% on Chief at Winnipeg (J.W. Scannell). Forty per

lesions occurring about the lower buds; the rows had been allowed to become thick and weedy (G.C. Chamberlain). Severely affected canes were received from Warren (H.N. Racicot). More than 50% of the canes were seen to be affected in some Ont. plantings (J.E. Howitt). Spur blight was prevalent in a few commercial plantings on Ile d'Orleans, Que., and killed a number of young canes (C. Perrault). A few canes from a planting at Digby, N.S. were blighted (H.N. Racicot). The disease was common in many small plantings in P.E.I. and was serious in one commercial (plantation. (R.R. Hurst)

ANTHRACNOSE (Elsinoe veneta). A specimen was received from Wynyard, Sask. (R.C. Russell). The disease caused from slight to severe damage on black raspberries at Morden, Man. (W.L. Gordon). In Lincoln, Wentworth, and Huron counties, Ont., anthracnose was general and heavy on Nancy and Taylor, though the damage was slight (G.C. Chamberlain). It was scattered in Que. (O. Caron)

CANE BLIGHT (Leptosphaeria Coniothyrium) was found in a planting at Edmonton, Alta. (M.W. Cormack). This disease was widespread in Man., causing considerable losses, especially in central and northern areas (W.L. Gordon). Ten per cent of the canes in a large planting at Steinbach, Man. were infected (J.W. Scannell). It caused the death of many canes on Ile d'Orleans, Que. (C. Perrault)

YELLOW RUST (Phragmidium Rubi-idaei) was general on susceptible varieties in Vancouver Island and the lower mainland, B.C.; aecia were seen on leaves in N.Saanich on April 25. (W. Jones)

LATE RUST (Pucciniastrum americanum). At Morden, Man., leaf infection was general; on Viking, fruit infection also occurred (W.L. Gordon). This rust was general on Viking at Barton, Ont., causing premature defoliation; damage was slight because it occurred late in the season (G.C. Chamberlain). In York Co., N.B., aecia were seen on white spruce on June 4; by late July it was very heavy, especially on Viking and in the plantation closest to the rusted spruce (S.F. Clarkson). The entire crop of a large Viking plantation at Southport, P.E.I. was destroyed by late rust, and other plantations in P.E.I. were seriously affected. (R.R. Hurst)

LEAF SPOT (Septoria Rubi) was general on Washington at Agassiz, B.C., and also occurred on Cuthbert; it damaged R. spectabilis severely and R. parviflorus slightly to moderately in the lower mainland (W. Jones). A light infection occurred at Prince Albert, Sask. (R.C. Russell). In Man. the disease was widespread and heavy; lesions often occurred on bark as well as leaves (W.L. Gordon, J.W. Scannell). Leaf spot was general but of little importance in the Niagara Peninsula and Western Ont. (G.C. Chamberlain), It caused slight to moderate damage on the common varieties in York Co., N.B. (S.F. Clarkson)

POWDERY MILDEW (Sphaerotheca Humuli) was general in a few rows of Latham at Gordon Head, Vancouver Island, but absent from adjacent Lloyd George; Latham seems to be the only susceptible commercial variety in B.C. at present (W. Jones). An entire planting was attacked at St. Lina, Alta. (M.W. Cormack). Slight injury was caused to young leaves in a garden at Prince Albert, Sask. (R.C. Russell, P.M. Simmonds). At Morden, Man., Ottawa 275 was severely affected; it is distinctly susceptible (W.L. Gordon). Heavy infec-

tions were seen on Latham in Ont., especially in nursery plantings in wet locations, resulting in stunting and spindly top growth; Latham is extremely susceptible (G.C. Chamberlain). Mildew was serious on Latham in Ile d'Orleans, Que., and slight on varieties in adjacent rows. (C. Perrault)

VERTICILLIUM WILT (V. sp.) killed 5% of young canes of Cuthbert in a nursery planting at Louth, Ont. (G.C. Chamberlain); 5% of the plants of O 272 in variety test plots at L'Assomption, Que. were infected. (L.T. Richardson)

LEAF CURL (virus). A moderate infection was seen in a garden at Pontrilas, Sask. (R.C. Russell). Leaf curl was prevalent throughout Manitoba (J.W. Scannell). A 2% infection in a Cuthbert plantation in Welland Co., Ont. caused severe stunting (G.C. Chamberlain). Leaf curl (Rubus virus 3A) was common on wild black raspberry in York Co., N.B. (D.J. MacLeod)

MOSAIC (virus). Moderate infection occurred in a garden at Prince Albert, Sask. (P.M. Simmonds, R.C. Russell). Mosaic was slight on some varieties at Morden, Man. (W.L. Gordon), and was widespread but not severe in the province (J.W. Scannell). Ten per cent of plants in a Cuthbert plantation in Welland Co., Ont. were infected (G.C. Chamberlain). Mosaic was general in Que. (O. Caron). Three per cent of Viking and 15% of Latham in a plantation in Sunbury Co., N.B. were diseased, and mosaic was common on wild red raspberries in York, Sunbury, Carleton, Victoria, Kings and Westmorland counties. A well-defined yellow mosaic (Rubus viruses 1 & 2) was common on wild black raspberry in York and Sunbury counties (D.J. MacLeod). At the Station, Kentville, N.S., 1 out of 249 plants of Taylor, 2 out of 527 plants of Viking, and 10 out of 223 plants of O 275 were rogued for mosaic; no affected plants were found in the other varieties (J.F. Hockey). Occasional plants were found in the larger plantings in P.E.I., but from traces to 100% infected plants were found in small gardens. (R.R. Hurst)

YELLOW BLOTCH CURL (virus) increased in amount since 1941 in a Cuthbert plantation at Arkona, Ont., 12% of the plants being affected. (G.C. Chamberlain)

WINTER INJURY seriously affected Viking in commercial and garden plantings in P.E.I. (R.R. Hurst)

SAND CHERRY

SHOT HOLE (Cercospora circumscissa). Sioux variety was severely infected at Brandon, Man. This is the first record on sand cherry in Man. (W.L. Gordon). See entry under plum.

POWDERY MILDEW (Podosphaera Oxyacanthae). A trace to light infection was found in plantings at Glenevis and Three Hills, Alta. (M.W. Cormack)

BROWN ROT (Sclerotinia fructicola). Abundant sporulation was seen at the base of affected spurs on June 17 at Morden, Man. (W.A.F. Hagborg)

LEAF & TWIG BLIGHT & POCKETS (Taphrina mirabilis (Atk.) Gies.) (det. W.W. Ray) caused blighting and loss of crop from a bush at Thornloe, Ont. (H.N. Racicot)

STRAWBERRY

GREY MOULD (Botrytis cinerea). A moderate infection occurred in one P.E.I. planting, severely damaging fruit and attacking some leaves. (R.R. Hurst)

LEAF SPOT (Mycosphaerella Fragariae). At Morden, Man., infection was most severe on Meighen, Horace, Martha, Louise, Claribel, Macdonald, Herman, and New Victoria (W.L. Gordon). At Goderich, Ont. leaf spot was unusually severe on trial varieties from Ottawa (G.C. Chamberlain). Five per cent infection was recorded on sprayed plantings at L'Assomption, Que., with no significant damage (L.T. Richardson). A light infection caused slight damage to Princess and Dunlap at Kentville, N.S. (G.W. Hope). Leaf spot was general in P.E.I. and heavy in some areas. (R.R. Hurst)

FRUIT ROT (Rhizopus sp.) One hundred per cent infection with severe decay occurred in one lot of fruit in Queens Co., P.E.I. (R.R. Hurst)

POWDERY MILDEW (Sphaerotheca Humuli). A 100% infection in Vercheres Co., Que. greatly reduced the crop (E. Lavallee). The disease was seen in several other Que. localities (L.J.S. Laporte). Mildew was heavy in a few localities, but generally light and scattered in Queens Co., P.E.I. (R.R. Hurst)

ROOT ROT (cause unknown) was severe in some plantations in Waterloo and Prince Edward counties, Ont., J.E. Howitt). Seventy-five per cent infection was reported from L'Assomption, Que. (L.T. Richardson)

JUNE YELLOWS (?virus) was severe on Dick, Premier, and Ralph at Kentville, N.S. (J.F. Hockey). It also re-appeared on Dick in P.E.I., the symptoms diminishing as the season advanced. (G.C. Warren)

DROUGHT INJURY. Dry weather during the strawberry season enabled observations to be made, on July 3 and 4, in the test plots at Kentville, N.S. The following varieties showed no wilting and little or no purpling and spotting of foliage: Abbot, Bennett, Bowell, Charles, Chesapeake, Claribel, Clermont, Cooper, Culver, Dick, Florence, Jessie, Macdonald, Nokomis, Perley, Simcoe, Tilley, Walter, Wright, #4734. The following showed little or no wilting and moderate purpling or spotting: Carl, Clare, Herman, Jim, John, Magee, Martha, McKenzie, Meighen, North Star, Pathfinder. The following showed moderate wilting, with varying amounts of purpling or spotting: Borden, Cartier, Cato, Catskill, Dorset, Fresden, Laurier, Lemieux, Louise, Minnehaha, Ralph, Robert, Senator Dunlap, Tupper. The following showed severe wilting, with varying amounts of purpling or spotting: Aroma, Edward, Howe, King, Lavergne, William. (J.F. Hockey)