V. DISEASES OF FRUIT CROPS

APPLE

FIRE BLIGHT (Erwinia amylovora). Infection was moderate to severe on several trees in the orchard at the Dominion Experimental Station, Lethbridge, Alta. (A.W. Henry and G.B. Sanford). It was also observed at the Horticultural Station, Brooks (G.B. Sanford); a trace was found on Pyrus ussuriensis at Beaverlodge (W.C. Broadfoot). This is the first report of fire blight in Alberta. The disease is now known from every province of the Dominion. H. R. McLarty and G. E. Woolliams (Rept. Dom. Botanist for 1930: 114.1931) have demonstrated that Pyrus ussuriensis is moderately susceptible.

The fire blight epidemic this year was the most severe ever experienced at the Experimental Station, Morden, Man. Thousands of trees of various ages were destroyed. Several varieties, notably the Tate-Dropmore pear, formerly considered resistant, were attacked. The organism was isolated and was found to be pathogenic to apple, apricot, plum and sand cherry, although cross inoculations indicated that there may be some specialization on the different hosts. The probability of physiologic specialization and also of disease escape even in fairly severe epidemics suggests the advisability of developing some means of testing new varieties of fruit trees by artificial inoculation. Fire blight was also observed at Winnipeg and Miami, but the infection was moderate (W.A.F. Haghorg).

Fire blight was quite prevalent in many orchards in Ont. In several orchards inspected, the diesase had caused considerable injury, especially on Greening (J.E. Howitt). Fire blight was observed several times. It was most severe on Yellow Transparent, on which overwintered cankers were quite commonly found (G.C. Chamberlain). A severe epidemic of fire blight developed in the Ottawa district in June, both on the Ont. and Que. side of the river. The disease was also severe in the orchard at the Central Experimental Farm. Many of the infected trees in garden and home orchards are varieties of crab apple and Yellow Transparent with some Alexander. (H.N. Racicot)

Throughout the apple districts in south-western Quebec fire blight was present in dangerous amounts; careful pruning in the fall will be necessary to prevent a possible devastating epidemic in 1942. An exception was the Abbotsford district, where most growers have continually made a serious effort to carry out control recommendations. In this district, an appreciable amount of fire blight was detected in only one orchard, which still retains the remnants of a block of highly susceptible varieties. The potential menace of such varieties was best illustrated at Franklin Centre, where a small ill-kept, unpruned, almost worthless orchard consisting largely of sickly Alexander trees, was the focus of infection for several neighboring well-cared-for orchards. In most districts, McIntosh showed a higher incidence of spur blight than Fameuse, the reverse of what usually happens. Due to the unusually dry summer, fire blight did not actually develop to the extent at first anticipated. On the other

hand, vigorous vegetative growth can be expected following the short crop this year (F.S. Thatcher). Several trees of Wolf River and Wealthy were severely affected in a small neglected orchard at Beaumont (R.O. Lachance). Fire blight was recorded on trees in abandoned orchards in P. E. I. (R.R. Hurst)

ROT (Gloeosporium album) was very common on apples in cold storage at Fredricton and Keswick Ridge, N.B. (S.F. Clarkson)

RUST (Gymnosporangium clavipes). A trace was present on Rome Beauty in the spray plots at Kentville, N.S.; a trace was also found on other varieties in commercial orchards in Kings Co. (J.F. Hockey). The rust, Gymnosporangium Juniperi-virginianae, was abundant on apple in the immediate vicinity of the red cedars in an old pasture in Norfolk Co., Ont., but it was present to a slight extent only in apple orchards surrounding the pasture. (J.E. Howitt)

TWIG BLIGHT (Nectria cinnabarina) was found affecting 2-3% of the twigs of Rome Beauty and Gano in several orchards in Kings Co., N.S. (J.F. Hockey)

EUROPEAN CANKER (Nectria ditissima) was present on over 10% of young Delicious and Wagner trees in an orchard block in Kings Co., N.S. (J.F. Hockey)

ANTHRACNOSE (Neofabraea malicorticis) was general and caused moderate damage on the lower mainland and Vancouver Island (W. Jones). New cankers were more numerous than usual in the Salmon Arm district probably on account of extensive rains in the early fall of 1940. (G.E. Woolliams)

BULL'S EYE ROT (Neofabraea malicorticis or N. perennans) was reported to have caused considerable loss of fruit in storage during the winter of 1941. (H.R. McLarty)

ROT (Penicillium expansum) was recorded affecting apples in storage at the Station, Fredricton, N.B.

TWIG BLIGHT (Phoma Mali) caused moderate damage in the University orchard, Winnipeg, Man.; Pycnidia were abundant on the twigs. According to Freeman Weiss (P.D.Reptr. 25: 374. Aug. 1, 1941) Phoma Mali Schulz & Sacc. is probably a synonym of Phoma ambigua Sacc. = Phomopsis ambigua (Sacc.) Trav., the conidial stage of Diaporthe ambigua Nit. (W.A.F. Hagborg)

BLACK ROT (Physalospora obtusa) caused severe leaf spot and canker on a few neglected trees at Pomeroy Ridge, N. B. (S.F. Clarkson). Black rot was observed in several orchards in P. E. I.; a heavy infection occurred on Alexander in Kings Co. (R.R. Hurst)

CROWN GALL (Phytomonas tumefaciens) was found on one McIntosh tree in an orchard in Queens Co., P.E.I. This is the first record of the disease on apple in P.E.I. (R.R. Hurst)

CROWN OR COLLAR ROT (Phytophthora Cactorum) of apple is one of the most destructive diseases in the Okanagan valley, B.C. It is estimated that at least 2% of the apple trees in the district are diseased and in some orchards, 40% have been found affected. At the present time, a high percentage of the affected trees die. Typical symptoms have been produced in 70 trees of various ages by inoculation with P. Cactorum under field conditions. To initiate infection, so far it has been necessary to insert the inoculum in a wound to the depth of the cambium. For the control of the disease, the present recommendations are to avoid excessive soil moisture, to clear away the soil around the crown of affected trees for the warm months since the development of the pathogen is checked by the drying of the tree crowns and to plant seedlings at the base of an affected tree and graft their tops into healthy tissue in the trunk above the rot. Experiments are in progress to devise a method of protecting the trees through the use of fungicides applied to the soil around the crowns and to select Phytophthora-resistant varieties or rootstocks which may be used for replacements or in new orchards. McIntosh appears to be resistant. (H.R. McLarty and M.F. Welsh)

POWDERY MILDEW (Podosphaera leucotricha) moderately infected the foliage on Vancouver Island, B.C. (W. Jones). Although powdery mildew was very prevalent on the foliage in the Okanagan Valley, it did little damage to the fruit (R.E. Fitzpatrick). A light scattered infection was present on unsprayed Cortland trees in an orchard in Lincoln Co., Ont. (G.C. Chamberlain). Powdery mildew has been quite prevalent on the foliage of young McIntosh trees in York and Charlotte Counties, N. B., for the last 2 years. Many growers do not spray young trees the first or second year after they are planted (S.F. Clarkson). The disease was observed on young wild trees along roadside in Queens Co., P.E.I. (R.R. Hurst)

SILVER LEAF (Stereum purpureum). Several young McIntosh trees were found affected in York and Queens Co., N.B.; in most trees only leaf symptoms were visible, but a severe canker was present on a few trees. (S.F. Clarkson)

PINK ROT (Tricothecium roseum) was noticed on apples on the market at Charlottetown, P.E.I.

SCAB (Venturia inaequalis) was moderate on the lower mainland and Vancouver Island, B.C. (W. Jones). Apple scab is a minor disease in the Okanagan valley and is of economic importance only in the northern sections of the district at Salmon Arm and Vernon. Three sprays, pink, calyx and first cover give adequate control when they are properly applied. In this district, Elgetol, containing di-nitro-cresol as the active principle, has been used with considerable success to kill out the fungus in the leaves as they lie on the ground over the winter. (H.R. McLarty). Scab was present around Grand Forks, where it ordinarily does not occur; a long period of rainy weather in May and June probably accounts for its occurrence (G.E. Woolliams).

Scab was of minor importance in most districts in Ontario. In the Niagara Peninsula, ascospores were discharged in quantity, but conditions

were unfavourable for primary infection. Initial discharge occurred early, on April 20, while the major discharge took place May 16-28. The first critical infection period occurred on May 31 and primary infection was noted on June 20. Secondary infection was well established in early July, when foliage infection was 13% on unsprayed trees and 1-6% on sprayed. Very little further spread took place and the fruit remained clean (G.C. Chamberlain). Scab development was unusually slight in western Quebec, many orchards being almost free.(F.S. Thatcher). Scab was more easily controlled than usual in western Que. due to the lack of rain. Some primary infection was present at the end of June, but very little secondary infection developed. (F. Godbout). About Quebec city, excellent clean fruit was produced in family and small commercial orchards, where the trees were sprayed, but the crop was unusually poor in the unsprayed. (O. Caron)

Apple scab was very prevalent and destructive in N.B. Perithecia were more numerous than for several years. Ascospores were formed and coloured at Fredericton on April 22, in the southern part of the province on May 8-10 and in the eastern area May 21-24. Initial ascopore discharge took place at Fredericton May 20-25, when buds were in the pink stage. Primary infection was found affecting sepals and leaves when the trees were in full bloom on June 4. Early scab was severe in some orchards, causing cracking and deforming of the fruit. However, most growers obtained good control of scab with the applications up to and including the first cover spray and accordingly omitted the second cover spray. The weather was subsequently very cool with frequent heavy rains and little sunshine with the result that late scab was prevalent on the fruit. (S.F. Clarkson)

Ascospores were late in maturing in the Annapolis valley, N.S., but they were produced in abundance early in a 20-day period of rain in May. Under the conditions prevailing it was difficult to spray and as a result considerable early scab infection occurred. The first scab lesions were found on May 27 and scab had become very abundant in many orchards by June 10. Heavy applications of spray reduced spread of the disease and late scab infection was much less than anticipated. Fruit of excellent quality was produced in well-sprayed orchards, where growers were able to commence operations early in May, but fruit of a lower quality due to scab and insects was harvested in most orchards in which only 3 or 4 sprays were applied (J.F. Hockey). Scab was very severe in P.E.I. Initial ascospore discharge occurred on May 15 and by that date 2 sprays had been applied. Due to broken weather, it was difficult to adhere to a regular spray schedule. Foliage infection developed very early and late scab infection was heavy. As a result much of the crop was unmarketable. (R.R. Hurst).

MOSAIC (virus) was found on a few trees of Wolf River and Wealthy at Woodstock, N.B. A mosaic-like mottle was also noted on the variety Bethel in York, Sunbury, Queens and Charlotte Counties. (D.J. MacLeod)

BITTER PIT (non-parasitic) affected a trace to 40% of the fruit on Baxter and Wealthy trees in York Co., N.B. The trouble was more prevalent on trees suffering from winter injury or otherwise unhealthy than on vigorous ones. (J.L. Howatt)

CANKER (cause unknown). McIntosh trees bearing large often deep cankers on the trunk and limbs were found at Hampton, Lower Gagetown and Keswick Ridge, N.B. So far the cause has not been determined. (S.F. Clarkson).

CHLOROSIS (non-parasitic). Several trees were slightly to moderately affected at the Station, Lethbridge, Alta. (G.B. Sanford)

DROUGHT SPOT, CORKY CORE and DIE BACK (boron deficiency). Some drought spot and corky core occurred in the Okanagan Valley, B.C., in orchards that were treated with boric acid at the rate of 0.5 lb. per tree three years ago. All trees in the experimental plots have remained healthy after 6 years. As a result of the general applications in 1936 and in 1939, a considerable reserve of boron has been built up in the soil and it will probably be 1943 or 1944 before a third application will be necessary (H.R. McLarty). Drought spot was found affecting a number of large Wolf River apples in an orchard in Queens Co., N.B. Internal cork affected 65% of the apples on about 100 Cortland trees in the spray pl t at Springhill, while fruit on McIntosh and Lobo trees in the same block were normal. The apples were slightly pitted over their entire surface. (S.F. Clarkson)

FASCIATION. The branches on one Fameuse tree at Woodstock, N.B., were found to be fasciated and twisted spirally. (D.J. MacLeod)

FROST INJURY. A drop of the temperature to 27° F. on May 27 followed by high winds caused considerable injury to leaves in orchards in N. B.

LEAF SCORCH (cause unknown) was not as severe as in 1940 in the Okanagan Valley, B.C., but was present to some extent in the same orchards that were affected last year. The trouble seems worse on trees with heavy crops. Its lower incidence this year may be due to the fact that the crop was light in 1941. (R.E. Fitzpatrick)

LEAF SPOT (?Hormodendron sp.) caused severe defoliation in several places in the Okanagan Valley, particularly in the Oliver district. It appeared in mid-season. The prolonged wet period may be responsible for its occurrence. The leaves show typically a scorching around the edge of the leaf and an indeterminate spotting of the leaf surface. (R.E. Fitzpatrick and H.R. McLarty)

NITRE BURN caused a severe burning of the leaves and defoliation in an orchard in Lincoln Co., Ont., due to cyanamid being carried by the wind to the foliage when an application of the fertilizer was being made to asparagus. (G.C. Chamberlain)

HAIL affected from 15 to 90% of the fruit in the orchards in Hemmingford and Frelighsburg districts, Que. (F.S. Thatcher)

POTASH DEFICIENCY. Symptoms of deficiencies of potash and magnesium were encountered in varying degrees in southwestern Quebec, particularly in the Chateauguay, Frelighsburg and Abbotsford districts. The symptoms were most pronounced on gravelly soils, particularly where a "hard-pan" was present near the surface and were probably more conspicuous due to the drought. (F.S. Thatcher) Potash deficiencey was observed affecting the occasional tree in Queens Co., P.E.I. (R.R. Hurst)

RUSSETING (spray injury) was not general this year in the spray plots in York Co., N.B., since the weather was generally fine during the application of the early sprays. Apples sprayed with Bordeaux at the pre-pink, pink and first cover stages were rough to the touch. Fruit sprayed with iron-sulphate lime-sulphur were smoother and more highly coloured. (S.F. Clarkson)

WATER-CORE (non-parasitic) was more common than usual in McIntosh in York Co., N.B. All the fruit were affected in some old unknown varieties. (J.L. Howatt)

WINTER INJURY was unexpectedly severe and widespread in southwestern Quebec. Although rather extensive areas of the bark were killed, injury did not usually penetrate the innermost bark or cambium. The trees made remarkable recovery, but complete recovery will depend on the conditions during the winter 1941-42. It would appear that fertilizers too high in nitrogen were being used in the more severely injured orchards. (F.S. Thatcher)

APRICOT

CORYNEUM SPOT (C. Beijerinckii) was severe affecting all the fruit in one orchard in the Okanagan Valley, B.C.; the value of the fruit was halved. In general, the disease was not severe. (H.R. McLarty)

FIRE BLIGHT (Erwinia amylovora) A moderate infection was observed particularly on the branches of apricot at the Station, Morden, Man.; this is the first record of the disease on apricot in Manitoba. (W.A.F. Hagborg)

BLACKBERRY

ORANGE RUST (Gymnoconia Peckiana) was found moderately infecting Kittatinny in a planting in Lincoln Co., Ont. (G.C. Chamberlain)

BLUEBERRY

GREY MOULD (Botrytis cinerea) affected an occasional flower or fruit cluster of Vaccinium pennsylvanicum in the Tusket district, Yarmouth Co., N.S. (J.F. Hockey)

RUST (Calyptospora Goeppertiana) was found in almost every blueberry barren in Yarmouth Co., N.S., but it caused little damage due to the low percentage of affected plants. (J.F. Hockey)

RED LEAF (Exobasidium Vaccinii) was the most prevalent disease in the Tusket district, Yarmouth Co., N.S. It completely affected 3-10% of the clump areas and resulted in a loss of 1-3% of the fruit. (J.F. Hockey)

POWDERY MILDEW (Microphaera Alni var. Vaccinii). A light general infection was observed in the Tusket district, N.S., but little damage was apparent. (J.F. Hockey)

CHERRY

STORAGE ROT (Alternaria, Botrytis, Rhizopus, etc.) affected up to 30% (av. 11%) of the fruits in a shipment of Lambert cherries from Creston, B.C., received in Toronto. An early shipment to Ottawa showed 2% due to Botrytis. The fruit was apparently allowed to become overmature. (H.N. Racicot)

BLACK KNOT (Dibotryon morbosum). A moderate infection was found in 4 orchards in Queens Co., P.E.I., and also in Kamouraska Co., Que.

SHOT HOLE (Higginsia hiemalis (Cylindrosporium hiemale) caused much damage in nurseries on Vancouver Island and the lower mainland, B.C. (W. Jones and W.R. Foster). A moderate infection was found on the European dwarf or ground cherry (Prunus fruticosa) at Morden, Man.; some seedlings appeared to be immune (W.A.F. Hagborg). Shot hole, epidemic in 1940, was of little importance in 1941 except in one orchard in Lincoln Co., Ont., where considerable defoliation occurred. The orchard is on light soil, low in fertility; this may have affected the prevalence of the disease. A light infection was noted in a nursery in Welland Co. (G.C. Chamberlain). Shot hole caused slight damage at the Station, Kentville, N.S. Traces were present in all cherry orchards in P.E.I.

BROWN ROT (Sclerotinia fructigena). A slight infection was reported on Vancouver Island and the lower mainland, B. C. (W.Jones) Blossom blight caused slight damage at the Station, Kentville, N.S. (D. MacLeod)

BLOSSOM BLIGHT (Sclerotinia ?laxa) caused moderate damage to sour cherries on Vancouver Island, B.C.; it was more severe than in 1940. (W. Jones)

POWDERY MILDEW (Podosphaera Oxyacanthae) moderately infected scattered trees in an orchard in Lincoln Co., Ont. (G.C. Chamberlain)

LEAF CURL (Taphrina Cerasi) was found on a few trees at Courtenay, B.C.; the fungus was determined by Dr. A.J. Mix. (W. Jones)

LITTLE CHERRY (?virus) is an important disease in the Kootenay Lake district, B.C. It was first noted in an orchard at Willow Point in 1933 and in 3 additional orchards in 1934. For several years it appeared to be confined to Willow Point, but it has now spread through a considerable portion of the Kootenay orchards. The only symptom is that the fruit on affected trees do not develop to normal size. As a result the crop is of little or no value. Preliminary tests by W.R. Foster indicate that the disease is caused by a virus (J.E. Eastham and H.R. McLarty). For a more extended account of the disease see Ann. Report B.C. Dept. of Agr. for 1940. 35:50-54. 1941.

MOTTLE LEAF (virus). Since 1940, 36 additional trees have been found at Nelson City, B.C., affected as follows: Bing 24, Royal Anne (Napoleon) 9, Black Republican 2, seedling 1. (T.B. Lott). Mottle leaf affected 1% of the trees in an orchard of Lambert and Bing at Keatings (W.R. Foster). Four trees of Black Tartarian were found affected in Essex Co., Ont.; leaves were narrow, sometimes mottled with leaf margin irregular. (G.C. Chamberlain)

RING SPOT (probably virus). Three trees were found affected in an orchard of 75 Montmorency trees in Lincoln Co., Ont. Diseased trees were characterized by delayed foliations, the smaller leaves showing distinct ring spot and mottling, which later became necrotic resulting in shot hole or extensive dead areas. New growth developed and the trees appeared to recover. (G.C. Chamberlain)

SPRAY INJURY from arsenical sprays was widespread in the Okanagan Valley, B.C., and was no doubt due to the exceptionally wet season (H.R. McLarty). Yellow leaf, as a result of injury by lime sulphur, was moderate on Seneca in an orchard in Lincoln Co., Ont.; this variety is very susceptible under hot dry weather conditions. Yellow leaf was slight to moderate in several orchards of Montmorency particularly where Bordeaux mixture was used in the schedule, but it was also found where straight lime sulphur was applied. (G.C. Chamberlain)

CRANBERRY

RED LEAF (Exobasidium Vaccinii) was observed occasionally in P.E.I. (R.R. Hurst)

LEAF BLIGHT (Naevia Oxycocci) Dearn.) affected almost 100% of the leaves in one bog and trace to 5% in 2 other bogs in Kent Co., N.B., and a trace in a 4th bog in Sunbury Co. (J.L. Howatt and S.F. Clarkson). The heavy infection was on plants of Vaccinium macrocarpon. (I.L. Conners)

FROST caused slight damage to the tips of the vines in the bog at Rusagonis, N.B.

CURRANT

WHITE PINE BLISTER RUST (Cronartium ribicola). Infection was general on black currant on the lower mainland, B.C. (W. Jones) Blister rust was abundant on black currants on the Island of Orleans, Que. Traces of rust were observed in 3 out of 10 plantings inspected at Ste. Famille as early as July 16. The rust gradually spread and increased in intensity as the season advanced so that infection was severe in most of the plantings on September 18. (O. Caron). Infection was severe on black currants at Fredericton, St. Andrews, St. Quentin and Sackville, N.B., sometimes causing partial defoliation (S.F. Clarkson). Infection was heavy in 10 gardens on red currant in Queens Co., P.E.I.; it was also severe on black currant. (R.R. Hurst)

LEAF SPOT (Mycosphaerella Ribis (Septoria Ribis). A slight infection was general in the University plots, Saskatoon, Sask. It was prevalent and severe on Kerry, Eagle and Topsy at Indian Head.

POWDERY MILDEW (Sphaerotheca mors-uvae). Only a trace was present this year at Saskatoon, Sask.

GOOSEBERRY

LEAF SPOT (Mycosphaerella Ribis (Septoria Ribis) was prevalent and severe at Indian Head, Sask.

RUST (Puccinia Pringsheimiana) was generally prevalent in June, specimens being received from Digby, Annapolis and Kings Counties, N.S. (J.F. Hockey)

POWDERY MILDEW (Sphaerotheca mors-uvae). A trace to slight infection was found at Beaverlodge, Alta. A light infection was found marking the fruit in Lincoln Co., Ont. A heavy infection caused severe damage in Queens Co., P.E.I.

GRAPE

POWDERY MILDEW (Uncinula necator) is the most important disease of grape in the Okanagan Valley, B.C., at the present time. It has been particularly severe on European varieties. It caused heavy losses in some vineyards in the Oliver district.

LOGANBERRY

DRY BERRY (Haplosphaeria deformans). Infection was general and affected up to 25% of the fruits in many plantations on the lower mainland and Vancouver Island, B.C. (W. Jones and W.R. Foster)

LEAF SPOT (Septoria Rubi). Infection was general and damage was moderate in sheltered plantings on the lower mainland and Vancouver Island, B.C. (W. Jones)

PEACH

SCAB (Cladosporium carpophilum) was found in several orchards in widely separated districts in the Niagara Peninsula, Ont. (G.C. Chamberlain)

BACTERIAL SPOT (Phytomonas Pruni) was found in an orchard at Fenwick and another at Port Dalhousie, Ont. (G.C. Chamberlain)

STORAGE ROT (Rhizopus sp.) caused a 30% loss in a shipment of fruit from the Okanagan Valley to Victoria, B.C.

BROWN ROT (Sclerotinia fructicola) caused considerable damage to the fruit in one garden at Victoria, B.C. (W. Jones). Little blossom blight and brown rot were present in the orchards this season in the Niagara Peninsula as the weather was comparatively dry. (R.S. Willison)

POWDERY MILDEW (Sphaerotheca pannosa) caused no severe losses in the Okanagan Valley, B.C., this year, but the disease was present. Little foliage infection occurred before midsummer. (R.E. Fitzpatrick)

LEAF CURL (Taphrina deformans) was unusually prevalent in the Okanagan Valley, B.C., this spring, although in only a few orchards was it severe enough to cause any real damage. (R.E. Fitzpatrick)

PRUNE MOSAIC (virus). Symptoms similar to those obtained in 1940 on peach by inoculation with prune mosaic virus (P.D.S. 20:82) were found for the first time in various parts of the southern Okanagan Valley during the orchard survey. Affected trees numbered 211 out of 5,137 examined. Transfers from peach to either peach or prune have yet to be completed. (T.B. Lott)

WESTERN X DISEASE (virus) reported last year as a "suspected virus disease" (P.D.S. 20: 79) was found again in the southern Okanagan Valley. In 3,649 trees new infections amounted to 1.1% this year compared to 1.7% before any diseased trees were removed. In the central Okanagan no infections were found in 259 trees surveyed compared to 2, since removed, found last year. Symptom expression was much less definite this year than in 1940. (T.B. Lott). Western X disease was first observed

in the Okanagan Valley in 1939. The areas most severly affected are Osoyoos and Oliver. It is now present also in orchards in Utah, Idaho, Oregon and Washington; in some orchards, 40 to 50% of the trees are affected and affected trees rapidly become unproductive. So far the highest infection in any orchard in the Okanagan has been 7%. (H.R. McLarty)

X DISEASE (virus). Although X disease was first found in the Niagara Peninsula, Ont., in 1941, the disease was apparently present in some orchards as early as 1937. Affected trees have been located mainly in the Bartonville district, but some 70 trees have been found in Niagara Township, Lincoln Co., and one near Beamsville (G.H. Berkeley, Can. Horticulture & Home Magazine 64:206. 1941). At almost every location diseased chokecherries were found in close proximity to the infected trees. This close association between chokecherry and peach has been demonstrated in Connecticut. Indeed spread of the disease apparently depends on the presence of chokecherries relatively close to the peach.

ETHYLENE DICHLORIDE INJURY. In one young orchard near St. David, Ont., the crowns of several trees were injured by ethylene dichloride emulsion used in the control of the peach borer. Damaged trees were partially to completely girdled resulting in gradations of injury from slight stunting and pale foliage to the death of the tree. (R.S. Willison)

INTERNAL BROWNING (non-parasitic). At harvest the flesh of the ripe fruit of Sea Eagle, grown in the Laboratory orchard, St. Catharines, showed a ring of more or less dessicated brown tissue around the pit. Frequently, lenticular cavities appeared in the brown flesh about the apical region of the pit. In some fruits the affected tissue was watersoaked or only partially browned. Sea Eagle is a white fleshed variety from South Africa. (R.S. Willison)

SPRAY INJURY. Shot hole and defoliation was severe on both peach and apricot in the Okanagan Valley, B.C.; from a careful examination of many affected orchards it was quite evident that the trouble was due to the affects of lead arsenate spray (H.R. McLarty). Severe foliage burn and defoliation were caused by the omission of hydrated lime in the zinc-lime-arsenical spray in several orchards in the Niagara Peninsula, Ont. (G.C. Chamberlain)

SUTURE SPOT (cause unknown) was looked for in the district between Beamsville and Grimsby, Ont., where it was prevalent on Elberta in 1940 (P.D.S. 20:80). A few affected fruits could be found on most of the trees in the earlier varieties, Golden Jubilee, Vimy and Valiant, but the bulk of the crop was normal; on these varieties suture spot appeared as a red, soft, juicy, riper wedge of tissue along the suture. Elberta fruits were free from the trouble. Several specimens were found, however, exhibiting symptoms as described in 1940, but sometimes resembling those of the earlier varieties. (R.S. Willison)

WIND DAMAGE. Heavy gales caused considerable damage in late September in the Niagara Peninsula, Ont. Damage was greater to trees under late

cover crop cultivation than to those under early cover cropping. In the Laboratory orchard, St. Catharines, each block receiving a different treatment contains 48 trees; damage was as follows:

Variety	Number damaged	Beyond Repair	Required wiring
Elberta			
late	9	2	2
early	4	0	2
White-fleshed			
late	8	1	3
early	4	1	2

(G.H. Berkeley)

WINTER INJURY. Considerable dead wood was apparent in many orchards in Lincoln Co., Ont., due to heavy moisture and late growth of trees in the fall of 1940. Some young trees also died, but drainage was not the best in those orchards. (G.C. Chamberlain)

PEAR

FIRE BLIGHT (Erwinia amylovora). A severe outbreak occurred in a few orchards in the Okanagan Valley, B. C. In general, the disease was no more prevalent than usual. The disease has been very successfully controlled by the persistent clean-up of the over-wintering cankers (H.R. McLarty). Several varieties of pears were attacked at the Station, Morden, Man. Large cankers were common even on the Tate-Dropmore pear, formerly considered to be resistant (W.A.F. Hagborg). The disease moderately infected Bartlett in an orchard in Kent Co., Ont., but without involving the main branches. (G.C. Chamberlain)

RUST (Gymnosporangium clavipes) caused slight damage in an orchard at Kentville, N.S. (D. MacLeod)

CROWN GALL (Phytomonas tumefaciens). Two-year-old trees, which were making poor growth were found to be quite heavily infected by crown gall in an orchard in Lincoln Co., Ont. (G.C. Chamberlain)

POWDERY MILDEW (Podosphaera leucotricha) caused damage to the fruit in some orchards in the Okanagan Valley, B.C. Apparently the disease spread from apple to pear (R.E. Fitzpatrick). Russetting of pear fruit is very common throughout the district. (H.R. McLarty)

SCAB (Venturia pyrina) was severe on D'Anjou at the Station, Sidney, B.C., but it was negligible on the other varieties; the disease was more prevalent than usual on scattered trees on Vancouver Island and the lower mainland (W. Jones). Scab was very severe on unsprayed trees

in several counties in N.B. (S.F. Clarkson). It was very severe on Flemish Beauty in an orchard in Queens Co., P.E.I.

STONY PIT (virus) was moderate on Bosc and D'Anjou varieties at the Station, Sidney, B.C. (W. Jones)

BITTER PIT (cause unknown) occurred in the D'Anjou variety in the Okanagan Valley, B.C., and caused appreciable losses in some shipments. (R.E. Fitzpatrick)

BLACK END (cause unknown) was present to some extent in most blocks of Bartlett pears in the Okanagan Valley, B.C. (R.E. Fitzpatrick). Black end was found affecting most of the fruit on scattered trees of Kieffer in an Ontario orchard. (G.C. Chamberlain)

IRON CHLOROSIS (lime induced) occurred on trees of pear, apple and cherry in certain restricted areas in the Okanagan Valley, B.C. It is worse in some years than others. In severe cases, no commercial crop is produced. (H.R. McLarty)

FROST INJURY. Typical russet banding developed on 75% of the Kieffer pears in an orchard in Kent Co., Ont., as a result of low temperatures when the trees were in bloom. Apple trees, which were in bloom a little later, escaped injury. (G.C. Chamberlain)

PLUM

BLACK KNOT (Dibotryon morbosum) was reported from 7 widely scattered localities in Que. Black knot appears to be fairly well controlled in a number of commercial orchards near Moncton, N.B., where the trees are sprayed according to the same schedule as apples. The disease is widespread and frequently severe in N.B. (S.F. Clarkson). Infection was a trace to very severe on Damson, Gage and other plums in Queens Co., P.E.I.; specimens were received from other parts of the province.

FIRE BLIGHT (Erwinia amylovora). A slight infection was observed at Morden, Man., on a few hybrid plums. The organism was isolated and found capable of attacking plum, apricot, apple and cherry when inoculated into wounds. (W.A.F. Hagborg)

BROWN ROT (Sclerotinia fruticola) was general and caused severe damage on occasional trees on Vancouver Island and the lower mainland (W. Jones). The disease was fairly common at the Station, Morden, Man., but it caused no serious damage (W.A.F. Hagborg). Brown rot destroyed 50% of the fruit in an unsprayed orchard at Chute à Blondeau, Ont. (H.N. Racicot) It caused slight to moderate damage in sprayed orchards in Westmoreland Co., N.B. (S.F. Clarkson). Considerable blossom blight occurred early in June in Kings Co., N.S.; the fruit was fairly

free from rot, where the trees were sprayed, but 50% or more were affected on unsprayed trees (J.F. Hockey). Brown rot was unusually destructive this year in P.E.I. in both sprayed and unsprayed orchards. Mr. Hockey suggested that the trees be more severely pruned and thinned to permit a better circulation of air. (R.R. Hurst)

PLUM POCKETS (Taphrina communis) destroyed one-third of the plums in an orchard at Venlaw, Man. (H.N. Racicot). The disease was very prevalent in northern Ont. on wild plums and cultivated varieties derived from Prunus americana and P. nigra (J.E. Howitt). Plum pockets was reported from Ste. Rosalie, Joliette and Sherbrooke, Que. Specimens were received from 2 orchards in P.E.I.

RUST (Transchelia Pruni-spinosae) was fairly general in the fall at the Station, Sidney, B.C. (W. Jones)

SHIRO LINE-PATTERN MOSAIC (virus) was first noticed in Ont. in 1938 (P.D.S. 19:92). It is now known to occur in two orchards (G.H. Berkeley, Can. Horticulture & Home Magazine 64:211. 1941).

PRUNE

PRUNE DWARF (Prunus virus 6) was observed in Ont. in 1937 (P.D.S. 19:91 and 20:79 as prune mosaic) and in the following year in B.C. (P.D.S. 18:86 and 20:82). In 2 out of 3 infected orchards in Ont., the disease was observed after Damson plums had been top-worked with Italian prune. To date the disease has been transmitted by budding and grafting only. For a fuller account see G.H. Berkeley, Can. Horticulture & Home Magazine 64:211. 1941.

SPRAY INJURY. In an orchard in Lincoln Co., Ont., sprayed twice with nicotine sulphate and soap for the control of aphids, with a week between applications, the leaves became spotted and yellow, followed by severe defoliation and drop of fruit. A similar case due to the same spray was seen in a 2nd orchard. (G.C. Chamberlain)

MINERAL DEFICIENCY. A condition thought to be due to lack of phosphate and potash caused a rolling of the leaves, purpling of the veins and marginal scorch in an orchard of Italian prune in Lincoln Co., Ont. This condition was also found in sour cherries in the same orchard and in several other orchards in the vicinity. (G.C. Chamberlain)

QUINCE

LEAF BLIGHT (Fabraea maculata (Entosmosporium maculatum) caused severe damage to the leaves in nursery stock at Sardis, B.C. (W. Jones)

RASPBERRY

SPUR BLIGHT (Didymella applanata) was conspicuous on the canes in a commercial planting of Latham and Cuthbert in Middlesex Co., Ont.; the planting had been allowed to become too thick (G.C. Chamberlain). The disease was general on the Island of Orleans and was very common in almost every plantation visited. Traces of spur blight were present on Taylor and Newburgh in the varietal plantings at Kentville, N.S. The disease was heavy on Viking in a planting in Queens Co., P.E.I.

ANTHRACNOSE (Elsinoe veneta) was found consistently affecting cane growth of Taylor in southern Ont.; damage appeared negligible. (G.C. Chamberlain). Some anthracnose was found on Latham, Taylor and Indian Summer in a varietal planting at Kentville, N.S. A trace was present on Lloyd George in a planting in Queens Co., P.E.I.

CANE BLIGHT (Leptosphaeria Coniothyrium). Traces were found on most varieties in the varietal planting at Kentville, N.S.

YELLOW RUST (Phragmidium Rubi-idaei) was general particularly on Cuthbert on the lower mainland, B.C.; it causes considerable reduction in yield. (W. Jones)

CROWN GALL (Phytomonas tumefaciens). Some 20% of the canes were affected in planting stock of Latham in Welland Co., Ont.; both crown and root galls were present (G.C. Chamberlain). A trace of crown gall was found in York and Sunbury Counties, N.B. It was recorded on Viking in Queens Co., P.E.I.

LATE RUST (Pucciniastrum americanum). A slight infection was observed on June 25 on young white spruce and the lower branches of a few older trees near a raspberry plantation, located in York Co., N.B., and where this rust has been severe in recent years. No infection was found beyond one-half mile from the plantation. Examination of the needles revealed aecia and subcuticular pycnia, which agreed with the published descriptions. It affected 5-75% of the fruit in this plantation of Viking and Newman in 1941. The rust may be found on immature or ripe fruit and its sudden "over-night" appearance on picked fruit makes them unsaleable. The uredinia are rather inconspicuous, but once the spores have escaped, their brilliant orange colour in mass renders them easily noticeable. If the fruit are now critically examined it is relatively easy to pick out the infected druplets. Probably spore development continues after the fruit is picked and instead of being carried away the spores collect at the mouth of each uredinium (S.F. Clarkson and I.L. Conners). Late rust was observed on the Island of Orleans, Que. Infection was very heavy in several plantations of Viking in Queens Co., P.E.I., and ruined a large part of the late picking. (R.R. Hurst)

LEAF SPOT (Septoria Rubi) was observed on the Island of Orleans, Que. It was quite common and caused some damage in raspberry plantations in York, Sunbury and Charlotte Counties, N.B.

POWDERY MILDEW (Sphaerotheca Humuli). A trace was found at Lacombe, Alta. Powdery mildew was heavy on Latham in a planting in Lincoln Co., Ont. (G.C. Chamberlain)

GREEN MOSAIC (virus) affected 10-20% of the plants in 4 plantings at Dewdney and Matsqui, B.C., and all the plants of Latham in a nursery at Sardis. The disease is widely distributed and growers have not yet taken to planting certified stock. (W. Jones)

LEAF CURL (virus) affected 25% of the plants in a Cuthbert plantation in Lincoln Co., Ont.; the plantation is no longer profitable. A 1% infection was also found in a Latham plantation, in which variety it is uncommon (G.C. Chamberlain). Two affected plants were found in the Marcy variety at Kentville, N.S.

MOSAIC (virus) affected 10% of the plants in 2 plantings at Dewdney, B.C. (W. Jones). It affected 50% of the plants of unknown variety at Grand Forks. Only one slightly affected plant was found at the Station, Beaverlodge, Alta. Mosaic was severe in several gardens at Saskatoon, Sask. Mosaic was widespread and quite common in commercial plantings especially those of Viking, Cuthbert and Latham over 3-4 years old in Ont. Several nursery plantings of Latham and one of Cuthbert were not certified because they contained too many mosaic-affected plants to permit rogling. The disease was present in one Newburgh nursery planting, but the variety rarely shows mosaic infection. The amount of mosaic found in Taylor seems to be increasing. In a planting of Cumberland black raspberry in Middlesex, Co., Ont., 5% of the plants showed mosaic; it caused a serious stunting and failure of crop in the affected plants (G.C. Chamberlain). Mosaic was common everywhere in Que. It affected 16% of the Viking plants and 46% of the Latham in a planting in Sunbury Co., N.B. (D.J. MacLeod). Mosaic was present in Viking, Latham, Taylor and especially Prussen in the varietal plantings at Kentville, N.S. Various amounts of mosaic were observed in Viking, Lloyd George and other varieties in P.E.I.

NECROTIC FERN-LEAF MOSAIC (virus). Symptoms similar to those described by G.C. Chamberlain (Sci. Agr. 22:2. 1941) were common on plants of Newman, Cuthbert and Latham at Abbotsford, Mission, Hatzic and Sardis, B.C.; in several plantings up to 50% of the plants were affected. (W. Jones)

YELLOW BLOTCH CURL (virus). A slight infection was observed in Cuthbert in the Hatzic and Mission districts, B.C. (W. Jones). Yellow blotch curl was an important disease in 3 Cuthbert plantings encountered in Middlesex, Ontario and Wentworth Counties respectively during inspection. (G.C. Chamberlain)

SAND CHERRY

BROWN ROT (Sclerotinia fructicola) slightly infected twigs and fruit at Morden, Man.

STRAWBERRY

GREY MOULD (Botrytis cinerea) was found particularly on the lower leaves in several strawberry plantations in the Grand Lake area, N.B. It also caused some decay of the fruit. (S.F. Clarkson)

LEAF SCORCH (Diplocarpon Earliana (Marsonnina Fragariae) moderately affected British Sovereign at the Station, Sidney, B.C.; none was found on John, Robert, Ralph and William. (W. Jones)

LEAF SPOT (Mycosphaerella Fragariae (Ramularia Tulasnei) was general and caused slight damage on the lower mainland and on Vancouver Island, B.C. At the Farm, Agassiz, B.C., leaf spot was severe on Simcoe, moderate on Borden, Laurier, Louise and Bowell, while Cartier, Abbot, Lavergne, Herman and King were clean (W. Jones). Leaf spot was very severe on Senator Dunlop, Louise, Martha, MacKenzie and King and a trace was present on Premier, Henry, Laurier, Lemieux, Simcoe, Dorsett and Robert in the variety tests at Fredericton, N.B. It was also very severe on Senator Dunlop at McLean Settlement on July 17 (S.F. Clarkson). Leaf spot was quite heavy at the Station, Charlottetown, P.E.I., and adversely affected the yield. (R.R. Hurst)

POWDERY MILDEW (Sphaerotheca Humuli) was heavy on Senator Dunlop in a planting in Queens Co., P.E.I.

JUNE YELLOWS (?virus) was observed in Dick in a planting in Queens Co., P.E.I. (G.C. Warren)

POTASH DEFICIENCY affected about 24% of the plants in 6 plantings in P.E.I.

ROOT ROT (cause unknown) is becoming more general in strawberry plantings on Vancouver Island, B.C.; at present the disease occurs in scattered patches in the fields (W. Jones). A.A. Hildebrand and P.M. West (Can. Jour. Res. 19(Sec. C):183-210. 1941) have recently published some interesting observations on the causes of strawberry root rot. Their studies on the decomposition of the tissues of red clover and of soybeans, two crops used in rotation with strawberry, indicate that the ability of soybean to control strawberry root rot depends primarily on the carbohydrate type of breakdown which the plant undergoes in diseased soil causing a highly favourable shift in the microbiological equilibrium. The putrefactive decomposition of red clover, on the other hand, did not induce these salutary effects.

In N.B. strawberry root-rot infected soil was found deficient in nitrate nitrogen, nitrite nitrogen, potassium, calcium, manganese and soluble aluminium compounds; acidity ranged from pH 4.8 to 5.5.

YOUNGBERRY

CROWN GALL (Phytomonas tumefaciens) was found on a few plants in one plantation at New Westminster, B.C.