IV. DISEASES OF FRUIT CROPS

APPLE

SCAB (Venturia inaequalis) was fairly general in the Fraser valley and on Vancouver island, B.C.; the damage was slight (W. Jones). In the Okanagan valley scab was unusually light this year and caused only light losses even in poorly sprayed orchards (G.E. Woolliams). A trace was present at Morden, Man.

Scab varied greatly in severity in Ont. in 1937; in some areas it was very severe. It was noticeable that scab was very late in developing in all areas. This fact was probably due to the scarcity of inoculum for primary infection, since the previous summer was extremely hot and dry. Little scab was observed until after the pink spray. From then on in unsprayed orchards scab increased in severity until trees showed 100% scab on leaves and fruit in many instances. It was also observed that even on sprayed trees a large percentage of the leaves showed scab late in the season (J. E. Howitt and R. E. Stone). Scab infection was light in the Niagara peninsula. In an experimental plot of McIntosh 12% of the apples harvested were scabby; the scab lesions were light and took place late in the season. Unsprayed McIntosh trees bore 50-65% scabbed apples, with infection more extensive and serious. Unsprayed Melba and Cortland had 60-65% scab; sprayed trees a trace to 3%. Primary ascospore discharge occurred on April 15, final discharge on May 27. Scattered primary lesions of a very limited extent were noted on June 8. Late season infection was common. (G.C. Chamberlain)

Apple scab was very destructive in south-western Quebec in 1937, as a result mostly of early infection. The spring was very wet, so wet that in many orchards it was impossible for the spraying machines to get through them before blossoming. On the other hand, quite a few orchards, which are always very thoroughly sprayed were surprisingly clean. (F. Godbout)

Scab was slight to severe on leaves and fruit in the Saint John River valley, N.B. Scab was severe in one orchard at Georgetown, which had been sprayed with Qua-Sul. Ascospore discharge began on May 10; scab was common on the leaves on June 23 (S.F. Clarkson).

Ascospores were mature before the buds opened as in 1936 at Kentville, N.S. Ascospore discharge began on April 12 and was completed on June 26. First infections were found on May 22. Scab was severe on the foliage of unsprayed trees by the end of June, and was causing some defoliation. Good control was obtained in well-sprayed orchards. Very little late scab developed on the fruit in the fall except on unsprayed trees. (J.F. Hockey)

Scab was not uncommon in 1937 even in sprayed orchards in P.E.I. Where the early sprays were well timed, scab was controlled, but in unsprayed orchards scab was severe. (R.R. Hurst)

FIRE BLIGHT (Erwinia amylovora). A trace was observed at Saskatoon, Sask. in July. A 30% infection was reported on all trees at Brandon, Man. In Ont. a scattered infection was noted on Greening in Lincoln county; moderate blossom infection with a few old cankers killing some limbs on Montreal Beauty at Dunrobin; severe on Tolman Sweet at Newmarket; 95% of the fruit spurs were affected on 14 small potted trees of Joyce and Melba at the Horticultural Division, Ottawa.

Fire blight caused little damage in south-western Que. in 1937; the disease occurred in a few orchards and in them it was localized to a few trees (F. Godbout). It was also noted on 2 trees of Pyrus baccata at the Farnham Station.

No fire blight was found in cared-for orchards, but it was plentiful in some abandoned orchards, in P.E.I.

BLACK ROT (Physalospora obtusa). Apple leaves infected with the fungus were found at French Lake, N.B. on May 21, and about 80% of the early leaves were affected in one orchard at Springhill on June 3. The disease was severe in area I at the Fredericton Station on July 14; it caused moderate damage to Crimson Beauty (S.F. Clarkson).

RUST (Gymnosporangium clavipes) caused some damage in the district about Ste. Anne de la Pocatiere, Que. It affected a few Gravenstein in the spray plots at Kentville, N.S. (J.A. Boyle)

POWDERY MILDEW (Podosphaera leucotricha) slightly to moderately affected Duchess of Oldenburg, Cox's Orange Pippan, Ribston Pippin, King David, Amlo, Ostosh and Thurso varieties at the Sidney Station, B.C. (W. Jones). It was observed on a Fameuse tree in Lincoln county, Ont., and on seedling trees at Rougemont, Que.

ANTHRACNOSE (Neofabraea malicorticis) was not so serious as in 1936 in B.C. As a bull's-eye rot it affected 10% of the fruit of McIntosh, Salome, Grimes Golden in an orchard at Salmon Arm, B.C.

EUROPEAN CANKER (Nectria galligena) was observed near Quebec, Que. Specimens of the canker were received at Kentville, N.S. from Lunenburg county, N.S.; the disease is also present throughout the Annapolis valley, but it is in general on the decrease. (J.F. Hockey)

DROUGHT SPOT and CORKY CORE (Non-parasitic). Up until 1937 drought spot and corky core of apple have occurred each year in British Columbia with increasing severity. In the fall of 1936 large acreages were treated with boric acid and as a result there was relatively little of these diseases this past season. It has been estimated that these treatments will mean an annual saving of 500,000 boxes to the fruit growers of British Columbia.

Other physiological disorders noted this season were: drought spot of pear, gum spot of prune, die back of apple, pear, plum, cherry, and peach. The die back has been satisfactorily controlled in our experiments with boric acid. The so-called drought spot of apricot was quite severe this past season. It has not been controlled with boron; consequently its cause is not yet established. (H.R. McLarty)

BITTER PIT (Non-parasitic) caused moderate damage to apples in the Saint John River valley, N.B., in 1937; it affected 10-50% of the fruit on the varieties Baxter, Wealthy, and Baldwin (S.F. Clarkson).

Bitter pit did not cause serious losses in the Annapolis and Cornwallis valleys, N.S. The average percentage of affected fruit was 3.5% in 12 orchards studied as compared with 40-50% in 1936. The highest percentage in an individual orchard was 10.7% as against 83% in 1936.

WATER CORE (Non-parasitic). A trace of water core was present in September in Alexander and McIntosh apples in York county, N.B.

TWIG BLIGHT (Nectria cinnabarina). A trace was found in N.B.

Gonatobotrys simplex Corda was found fruiting on twigs of McIntosh in York county, N.B. It was associated with pustules similar to Cytospora and Valsa (John Dearness, J.L. Howatt and S.F. Clarkson). Cytospora sp. is commonly associated with twig blight following winter injury in 1933-34. (J.L. Howatt & S.F. Clarkson)

TWIG BLIGHT (Phomopsis sp.). A Phomopsis sp., possibly P. Mali, was found associated with many cankers due to winter injury (J.L. Howatt & S.F. Clarkson).

WOOD ROT (Schizophyllum commune) is present throughout N.B. on apple trees, which were badly injured in the winter 1933-34. The fungus is most abundant on Fameuse. (S.F. Clarkson)

SILVER LEAF (Stereum purpureum). About 1% of the apple seedlings at the Fredericton Station, N.B. were affected (S.F. Clarkson). Silver leaf symptoms are on the increase in N.S. Fruit bodies of the Stereum were observed on only a few trees. The disease is more prevalent on weak trees (J.F. Hockey). Only a few trees were affected in a large block of seedlings at the Kentville Station (J. A. Boyle). Silver leaf was less in evidence in 1937 than in the previous years. It would appear that fruit trees are regaining their vigour, which was greatly lowered due to severe winter injury in 1933-34, in P.E.I. (R.R. Hurst)

The fungus was found at the base of a large Delicious tree growing in the Station orchard, Summerland, B.C. (G.E. Woolliams)

APPLE ROTS. An apple rot (Fusarium sp.) slightly affected 15% of apples on a few Crimson Beauty trees at Gagetown, N.B. Botrytis sp. severely affected 15% of apples on Alexander trees in an orchard in York county. A trace of Botrytis was common in N.B. on several varieties in September, before the apples were picked. (S.F. Clarkson)

BITTER ROT (Glomerella cingulata (Gloeosporium fructigenum) affected a small number of apples in a barrel from Gagetown, N.B. (J.L. Howatt)

STORAGE ROTS. Of the organisms causing rot in apples in storage at the Experimental Station, Fredericton, N.B. Dasycarpoma allantoideum was responsible for 77% of the rot. Gloeosporium album Osterw. is the more commonly accepted name for this pathogen. Penicillium sp. accounted for 12.8%, Botrytis sp. for 8.5%, and Fusarium sp. and Alternaria Mali for traces during the period Jan. to April 1937 (J.L. Howatt). Of 193 cultures of fungi causing rot in apples in cold storage at the Kentville Station, N.S. Penicillium expansum accounted for 44%, Botrytis cinerea 27%, Rhizopus nigricans 23%, and Alternaria sp., Mucor sp., and a few unidentified fungi the remaining 6%. (J.A. Boyle and K.A. Harrison)

CONIOSPORIUM SCAB (Coniosporium Mali Dearness & Foster) was found in the Sooke, Victoria, Sidney, and Duncan districts on Vancouver island, B.C., and at Armstrong in the Interior. Infection was fairly general, but the damage was slight (W.R. Foster). This is a new disease, an account of which has not yet been published.

HAIL INJURY occurred in some orchards near Summerland, B.C. in 1937.

SUN SCALD affected a few apples on the trees and some windfalls in York county, N.B.

LEAF SPOT (Cause unknown) caused slight to moderate damage on a number of varieties in York county, N.B.

BALDWIN SPOT (Non-parasitic) was seen on some apples from storage in March in Lincoln county, Ont. It was also noted on scattered fruit in September (G.C. Chamberlain).

RUSSETING (Effect of spray) was severe on McIntosh and Fameuse apples in one orchard at Douglas, N.B., Bordeaux 3-10-40 was applied as a calyx spray. (S.F. Clarkson)

SPRAY INJURIES. A variety of spray injuries were induced on the foliage by the different spray schedules in use on the spray plots at the Experimental Station, Kentville, N.S. Some mixtures containing copper produced a flecking on the leaves. A spray containing cryolite resulted in severe tip burn. Severe russetting of the fruit took place where copper-containing sprays were used for the "pink application" (J.A. Boyle). Severe calyx-end arsenical injury was noted on Cox Orange apples. The injury was probably due to the excessive use of arsenates in post-blossom applications. (J.F. Hockey)

FERTILIZER INJURY. A cyanamid application during the growing season caused 50% of the foliage to burn and to fall off by September 15 in a sandy orchard at Nictaux, N.S. Very little injury occurred in another orchard on heavier soil at Middleton, although treated at the same time. (K.A. Harrison)

NITRE BURN (Excess nitrogen) caused severe damage to a number of small trees in one orchard in York county, N.B. (S.F. Clarkson)

LEAF SCORCH (Potash deficiency). In an orchard of mixed varieties in Lincoln county, Ont., Baldwin showed most leaf scorch and was rather severely affected. McIntosh and Wealthy were in poor foliage indicating lack of fertility. In addition there was considerable spray injury on McIntosh as a marginal burn. (G.C. Chamberlain)

The trouble affected slightly, a few trees at Springfield, N.B.

APRICOT

BLIGHT (Coryneum Beijerinckii). The disease was observed at Boswell, B.C.

BLACKBERRY

ORANGE RUST (Gymnoconia Peckiana) was noted in several plantings in Lincoln county, Ont.; in one of Eldorado it affected 30% of the young growth. (G.C. Chamberlain)

CHERRY

SHOT HOLE (Higginsia hiemalis (Cylindrosporium hiemalis) was general and caused moderate damage on Vancouver island, B.C. (W.R. Foster). Shot-hole was very prevalent in Ont. on sour cherries late in the season. Many unsprayed trees were almost completely defoliated (J.E. Howitt and R.E. Stone). Yellow leaf and shot hole, a disease or diseases, caused in some cases almost complete defoliation of sour cherries in Essex and Kent counties (L.W. Koch). It was very prevalent on an unsprayed row of sour cherries in Lincoln county, while rows receiving spray according to the regular schedule showed very little disease. The disease was first noted on May 27. While it was very destructive to sour cherries it also occurred to some extent on sweet cherries (G.C. Chamberlain). Shot hole caused severe defoliation of seedlings at the Kentville Station, N.S. It also caused considerable defoliation in an orchard in Queens county, P.E.I., although the trees had been sprayed.

BLACK KNOT (Dibotryon morbosum) was reported from L'Islet and Sillery, Que.

BROWN ROT (Sclerotinia americana). A serious outbreak of brown rot developed on sour cherries in Lincoln county, Ont. following several days of rain and foggy weather in the latter half of May. It was most prevalent on Montmorency and Morillo. Infection occurred mostly at the base of the corolla and spread into the pedicel. Where the corolla had broken away, as in Early Richmond, there was less disease. Very little brown rot appeared in sweet cherries due to the advanced stage of the fruit (G.C. Chamberlain). Brown rot was severe on unsprayed sweet cherry trees at Charlottetown, P.E.I. (G.W. Ayers)

BLOSSOM BLIGHT (Sclerotinia cinerea) was serious in some unsprayed orchards on Vancouver island and in the Fraser valley, B.C. (W.C. Foster)

WITCHES' BROOM (Taphrina Cerasi) affected several trees at Point Grey, B.C. (J.W. Eastham)

VERTICILLIUM WILT (Verticillium sp.) infected 10% of the trees planted on ground previously in tomatoes in a 2-year-old sweet cherry orchard in Lincoln county, Ont. (G.C. Chamberlain)

LEAF SPOT and DROP. Two-year-old sweet cherry trees in a wet location in Lincoln county, Ont. were heavily defoliated. The leaves became red and spotted before falling. (G.C. Chamberlain)

DIE BACK (Non-parasitic) affected a few trees at the Summerland Station, B.C. See also Drought Spot and Corky Core of Apple.

CRANBERRY

RED LEAF SPOT (Exobasidium Vaccinii). Traces were found at Dalney, Brackley Beach, and Mermaid Lake, P.E.I. (R.R. Hurst)

RED GALL (Synchytrium Vaccinii) severe infections were reported in a bog at Port Mouton, N.S. The disease has been increasing in recent years (P.D.S. 16:55). (J.F. Hockey)

Gibbera compacta (Pk.) Shear (Venturia compacta Pk.) was found on several cranberry plants from Baie du Vin, N.B. It caused no apparent damage (J.L. Howatt). Specimens are in the Herbarium from Merigomish, N.S. (P.D.S. 14:111).

FROST INJURY. Frost injured 50% of the fruit on a large bog at Rusagonis, N.B. (S.F. Clarkson)

CURRANT

WHITE PINE BLISTER RUST (Cronartium ribicola) slightly affected black currants at the Summerland Station and Harrop, B.C. It was prevalent in garden plantings on Lulu island.

The currant and gooseberry plot of the Horticultural Division, Ottawa, Ont., was again inspected for rust. All the well recognized varieties of black currants were susceptible to very susceptible. Most of the red currant varieties were susceptible, while the gooseberries were at the most only slightly affected. For the past three years Franco German, Viking, Ribes manchurica, and one plant (19/11) of Ribes nigrum from Siberian Horticultural Station have remained free from disease. (H.J. Read)

A few bushes of black currants in a garden at West Bathurst, N.B. were heavily rusted. The rust was heavy and caused severe defoliation in P.E.I.

POWDERY MILDEW (Sphaerotheca mors-uvae) was found as follows on black currant: slight infection at the Summerland Station, B.C.; trace to slight infection at Edmonton and Lacombe, Alta.; severe on the younger leaves in September in the University plots, Saskatoon, Sask.

SEPTORIA LEAF SPOT (S. Ribis) was slight in the University plots, Saskatoon, Sask., and a trace to moderate at Morden, Man., on black currants at both places.

CORAL SPOT (Nectria cinnabarina). A single branch was affected in a few bushes of black currant at Kentville, N.S.

GOOSEBERRY

POWDERY MILDEW (Sphaerotheca mors-uvae) affected most of the fruit at the Summerland Station, B.C. It was very destructive on English gooseberries in Ont. In two cases the entire crop was destroyed. (J.E. Howitt and R.E. Stone). Traces were present in P.E.I.

WHITE PINE BLISTER RUST (Cronartium ribicola) See under currant.

ANTHRACNOSE (Gloeosporium Ribis) caused moderate damage in the Fraser valley, B.C.

GRAPE

DEAD ARM (Fusicoccum viticola) affected 10% of the arms of Concord in a vineyard in Lincoln county, Ont.; the disease was in an advanced stage. It also caused some damage in a Concord vineyard in Essex county. (G.C. Chamberlain)

DOWNY MILDEW (Plasmopora viticola) was general and heavy in yearling cuttings of Agawan in Lincoln county, Ont. In general Agawan appears to be very susceptible, Niagara moderately susceptible, and Concord quite resistant. (G.C. Chamberlain)

LEAF SCORCH (Potash deficiency) was general in a Concord vineyard in Lincoln county, Ont.

LOGANBERRY

ANTHER and STIGMA BLIGHT (Haplosphaeria deformans) caused a 20% crop loss in the Elk Lake district, B.C.;

elsewhere the loss was less than 1%. The disease is not increasing; it appears to be worse where air drainage is poor. (W.R. Foster)

LEAF SPOT (Mycosphaerella Rubi) was general and caused moderate damage on Vancouver island and the lower Mainland, B.C.

PEACH

LEAF CURL (Taphrina deformans) was prevalent in unsprayed orchards in Ont., the trees being often completely defoliated (J.E. Howitt and R.E. Stone). Several serious infections were seen in the Niagara district, especially on the Elberta variety and where spraying was not thorough or timely (G.C. Chamberlain). Fall and winter spraying with lime-sulphur as well as spraying in early April gave excellent control. There was some evidence that a complete schedule of sprays has a residual effect, but the problem needs to be tested further (R.S. Willison). Leaf curl was present in some young trees planted at Kentville, N.S., this spring.(K.A. Harrison)

POWDERY MILDEW (Sphaerotheca pannosa). A few twigs were infected at the Summerland Station, B.C. Powdery mildew was severe in one orchard and slight in another in Lincoln county, Ont. on fruit and young growth. It also affected scattered fruit in Essex county.

LITTLE PEACH and YELLOWS (Virus) were about as prevalent in the Niagara peninsula, Ont., as in 1936. They have been on the increase for the last two or three years. In late August Essex, Kent, and Norfolk counties were visited by Mr. G.G. Dustan and myself, but a careful search of peach plantations in the three counties failed to reveal any definite cases of these diseases. (R. S. Willison)

SUN SCALD was present in some orchards in Lincoln county, Ont. in April, but the damage was not extensive. The injury was thought to have taken place during the extreme heat in July 1936. Lesions appeared on the upper side of large branches extending in a north-easterly direction. Thus they were exposed to the direct rays of the sun in early afternoon. In the Laboratory orchard the damage was confined to that part of the orchard where the trees were not thriving, probably because of low fertility levels. Injury ranged from the death of outer layers of bark to the killing of the tissues at least as deep as the cambium. This condition was also observed in late August 1936, on a few trees. Some lesions were subsequently infected by canker organisms. (R.S. Willison)

VERTICILLIUM WILT (Verticillium sp.) severely affected 25 trees in a 2-year-old block of 100 trees in Lincoln county, Ont. The orchard was planted on ground previously in tomatoes, and the young trees were interplanted with tomatoes. It affected 20 trees in a 3-year-old orchard of 300 trees also in Lincoln county. (G. C. Chamberlain)

SCAB (Cladosporium carpophilum) disfigured considerable fruit in varying degrees in one orchard at Ruthven, Ont. On some trees more than half the fruit was affected. (L.W. Koch)

BLIGHT (Coryneum Beijerinckii) was observed in 3 orchards in Ont. In one orchard 5-8% of the fruit of one variety were disfigured by the blight. (J.E. Howitt and R.E. Stone)

SILVER LEAF (Non-parasitic) affected one tree at the Summerland Station, B.C.

ARSENICAL INJURY was general in an orchard in Lincoln county, Ont., causing a shot hole of the leaves and canker of tender twigs (G.C. Chamberlain). Several instances of arsenical burn on peach twigs in Essex county were brought to my attention. The twig laterals were affected and there was an exudate of gum around the nodes. Seasonal conditions probably exaggerated the injury. (L. W. Koch)

BROWN ROT (Sclerotinia americana). The period of bloom was prolonged in 1937 and marked by cool weather and abundant rainfall in Ont. Blossom blight was observed but was not serious in the Laboratory orchard, St. Catharines. Counts were, therefore, not made but the infection was estimated to be 1-2%. There seemed to be less blight where trees were sprayed with lime sulphur 1-50 in early bloom than where they were sprayed with Qua-sul or wettable sulphur. It also caused moderate damage on nursery stock in Lincoln county, partially or completely girdling some trees. Infection was apparently through recent wounds or leaf axils of the current season. (R.S. Willison)

CANKER (Valsa cincta) was present in nursery stock in Lincoln county, Ont. It originated chiefly at small twigs, either broken in packing or poorly matured on stock overwintered out of doors. On similar stock kept indoors no canker appeared according to the owner. (R.S. Willison)

PEAR

FIRE BLIGHT (Erwinia amylovora). Several Barlett trees severely infected were found in the Summerland district, B.C. A single infected tree was seen at Royal Oak.

SCAB (Venturia pyrina) was general and caused slight to severe damage on Vancouver island and the lower mainland of B.C. It was more severe than in 1936, owing to heavy June rains. It was severe in an orchard at Springhill, N.B. It was also heavy on unsprayed trees in P.E.I.

PLUM

BLACK KNOT (Dibotryon morbosum) was seen on a few trees at New Westminster, B.C. (J.E. Eastham). It was observed occasionally in York county, N.B., Kings county, N.S., and in P.E.I. It was also reported in Bonaventure and L'Islet counties and from Sillery and Montreal, Que.

PLUM POCKETS (Taphrina Pruni) was reported on a few trees at Burnaby, B.C.; causing a slight general infection in the University orchard, Winnipeg, Man.; was present in Beauce, Frontenac, Portneuf, and Champlain counties, Que.

BROWN ROT (Sclerotinia americana) was slight to moderate on Vancouver island and the lower mainland of B.C. It was common and destructive to European varieties in Ont. It caused most damage as the plums were ripening; trees were seen with 15-20% of fruit destroyed (J.E. Howitt and R.E. Stone). Brown rot affected up to 10% of the crop in orchards about Kentville, N.S.; it was most severe in trees with high crowns and in sheltered portions of the orchard. (J.F. Hockey)

A twig blight, caused by S. americana, was reported as fairly prevalent on pruned nursery stock in Lincoln county, Ont., by Mr. W.A. Ross. From samples examined it appeared that infection took place in axils of the leaves. The fungus was fruiting profusely on the dead bark and on the leaf blades and petioles. (R.S. Willison)

SHOT HOLE (Higginsia prunophorae (Cylindrosporium prunophorae) caused moderate damage on some varieties at the Sidney Station, B.C. Infection was moderate at Morden and slight at Brandon, Man. At the latter place it was particularly heavy on Prunus opata. It was noted on plums at the Farm, Ottawa, Ont. A number of unsprayed trees in York county, N.B. were severely affected.

BACTERIAL SPOT (Phytomonas Pruni) caused severe loss of marketable fruit in an orchard in Lincoln county, Ont. (G.C. Chamberlain)

VERTICILLIUM WILT (V. sp.) affected 3 trees in a block of 50 in an orchard in Lincoln county, Ont.

GUMMOSIS (Non-parasitic) was general in Yakama, Lincoln, and Italian Prune varieties at the Summerland Station, B.C.

SUN SCALD caused considerable damage to some old Lombard trees in the Laboratory orchard, St. Catharines, Ont. The symptoms were similar to those reported for peaches. It occurred on sides of branches exposed to the sun at the time of maximum heat during the day. Sun scald was not evident in young trees. Here, too, infection by Valsa spp. occurred in some cases. (R.S. Willison)

RASPBERRY

SPUR BLIGHT (Didymella applanata) was fairly general, but not as prevalent as in 1936 in the Fraser valley, B.C.; the damage was slight (W. Jones). It was observed in many plantations in Ont. and in some 5-10% of the canes were markedly affected (J.E. Howitt and R.E. Stone). A very severe outbreak was observed in Cuthbert plantations in Wentworth county, causing considerable damage. The spread had been favoured by heavy rains in September and close planting (G.C. Chamberlain). Spur blight caused moderate damage in several plantations of the Harrow district due to defoliation of lower sections of the cane and weakening of fruit laterals(L.W. Koch). The disease was common causing slight damage in York county, N.B. Traces were present mostly on Viking in P.E.I.

MOSAIC (Virus) was generally light on the varieties at Lacombe, Alta., being most prevalent on Marlboro and Sarah; traces were found at Beaverlodge. Mosaic affected 90% of the plants in a Cuthbert planting in Ontario county, Ont. Mosaic was reported as follows: Viking, 35% and 5%; Newman 15% in three plantations in York county, N.B. Mosaic is troublesome in most plantations in P.E.I., except where roguing is carefully practised.

ANTHRACNOSE (Elsinoe veneta) was severe on Lloyd George at Agassiz, B.C. and slight at Huntington and appears to be spreading in this variety. It also slightly infected Newman, Franconia, Chief, and Latham at Agassiz

(W. Jones). It affected black raspberry slightly on Lulu island. Anthracnose was severe in a plantation in Queens county, P.E.I.

YELLOW RUST (Phragmidium Rubi-idaei) was general on Cuthbert and Viking and caused moderate damage on Vancouver island and the lower mainland of B.C. It was first observed on the lower foliage about mid-May, but was probably prevalent prior to that time and it continued to spread to the end of the season. The varieties, Cuthbert and Viking, which were badly rusted in 1936 were the ones to suffer most from winter killing last winter. Rust was also present on Herbert at Agassiz (W. Jones). It was also severe in a neglected patch at Summerland.

LATE YELLOW RUST (Pucciniastrum americanum) caused severe damage to the fruits of Viking and Newman 23 in N.B., stunting the development of the green fruit and rendering the ripe berries unsightly (J.L. Howatt). Rust affected 30% fruits in a Viking planting at Kentville, N.S. Many fruits were deformed and hard. (K.A. Harrison)

POWDERY MILDEW (Sphaerotheca Humuli) affected fruits of Latham in a planting in Lincoln county, Ont. The druplets were white and shrunken.

VERTICILLIUM WILT (V. sp.) was severe on Lloyd George at Burnaby, B.C. and in a garden planting near Vancouver. It caused moderate damage to a Latham planting at Chilliwack, in a low poorly-drained area (W. Jones). It infected 20% of the Black Perfection plants in a plantation in Essex county, Ont. (G.C. Chamberlain)

CROWN GALL (Phytomonas tumefaciens) affected 2 Herbert plants in 50 in a planting in Queens county, P.E.I.

CANE BLIGHT (Leptosphaeria Coniothyrium (Coniothyrium Fuckelii) was found in a few plantations in the Fraser valley, B.C., but the disease was not serious. The disease was present on one cane received at Ottawa from Picton, Ont.

LEAF ROLL (Virus) affected 1% of the plants in an old plantation of Viking in York county, N.B.

DIE BACK (Armillaria mellea) was found in 5 plantations of Cuthbert, Viking and Lloyd George located in the Mission, Hatzic and Huntington districts, B.C. Many plants were killed, others were weakened with chloratic foliage. (W. Jones)

WINTER INJURY. Winter killing of the buds of the 1937 fruiting canes was very general in the Hatzic, Mission and Abbotsford districts, B.C. on Viking and Cuthbert. Rust was severe on these two varieties in 1936. Viking appeared to be more affected than Cuthbert, when the two were growing side by side. (W. Jones)

STRAWBERRY

LEAF SCORCH (Diplocarpon Earliana (Marssonina Fragariae) was general on British Sovereign, a widely grown and popular variety, on the lower mainland and Vancouver island, B.C. At the Sidney Station none was found on Kentish Favourite, Garibaldi, and Charlie and Dick. (W. Jones)

LEAF SPOT (Mycosphaerella Fragariae (Ramularia Tulasnei) was of general occurrence in most plantations on Vancouver island and the lower mainland, B.C., but the damage was slight. Leaf spot, a most common disease of the foliage of the strawberry in Ont., was especially severe on the varieties Glen Mary, Dunlop, Kellog's Beauty and Parson's Beauty. (A.A. Hildebrand). Leaf spot was common throughout N.B. and was severe in many plantings in York county. The disease was slight to severe in Queens and Kings counties, P.E.I.

POWDERY MILDEW (Sphaerotheca Humuli). The varieties which were most severely attacked by leaf spot in Ont. showed a correspondingly marked susceptibility to powdery mildew. Powdery mildew was general in the Southport and Montague districts, P.E.I., but it suddenly disappeared, a splendid crop being realized. (R.R. Hurst)

BLACK ROOT or ROOT-ROT. A survey of some 50 representative plantations were made between June 17 and July 12 in the more important strawberry growing districts in Central Ontario including Brighton, London, Midland and the Niagara peninsula.

One of the most interesting points in regard to strawberry root-rot this season as revealed by the survey, was the small number of cases encountered where the above-ground parts of plants in affected areas presented the typical root-rot picture. Only in seven of the more than fifty plantations visited, were noted the patches of dead plants characterized by their dried out, brownish-discolored foliage, and these were all in older (second-fruiting) plantations, not a single case being observed in a one-year-old planting. During the cropping season of the four years preceding 1937, the "scorched" areas had been

observed in many plantations, some in their first year of cropping. The explanation of the variation in the incidence and severity of root rot, as manifested by the above-ground symptoms, seems to be associated with the amount and distribution of rainfall. In the accompanying table is shown the amount of precipitation from April 26 until June 30 (which interval may be regarded as the critical period for the strawberry so far as soil moisture is concerned) during the past five years. Unfortunately, this table does not show distribution, which is just as important as amount.

Year	April 26-30	May 1-31	June 1-30	Total
1933	----	1.54	2.36	3.90
1934	.09	.52	2.09	2.70
1935	.87	4.93	3.73	9.53
1936	.34	1.63	1.51	3.48
1937	1.38	3.87	3.47	8.72

From this table it will be noted that the seasons of 1933, 1934 and 1936 were very dry and the drought factor would contribute very materially to the expression of root-rot symptoms. But why should root-rot have shown up in 1935 when there was greater precipitation than in 1937? The answer to this question is to be sought in a comparison of the distribution of rainfall for these two years. In May, 1935 there were 4.93 inches of rain, but for seventeen days, from May 9 until May 27 (during which period adequate soil moisture would be highly necessary for plants just about to produce their fruit), there was no rain at all and the plants suffered lasting ill effects. In May, 1937, there was 3.87 inches of rain which was so well spaced that the soil never had a chance to dry out. The favourable distribution of rainfall continued right through June, during which month there was 3.47 inches. From May 1 until June 30, the longest period without rain was six days and this occurred only once. During these two months the average periodicity of precipitation was 2½ days. Thus, from the standpoint of soil moisture, the early part of the current season approached the "ideal" for strawberries.

But even with an adequate, well-distributed rainfall, and with above-ground symptoms showing up to a markedly lesser degree, examination of a large number of roots in the many plantations visited revealed that root-rot was no less widespread and not very much less severe than in previous years. The incidence and severity of root-rot can be spoken of only in relative terms whether as regards different seasons, different plantations or different parts of the same plantation. Not a single two-year-old plantation was found to be free from the disease, but it was

much more serious in some than in others. With a cessation of rainfall, plants in many plantations, with their depleted root-systems, would soon have exhibited the typical symptoms associated with the disease.

During the current season the disease was found in soils virgin for strawberries at Aylmer and in soils which had received heavy applications of barnyard manure annually. In a plantation of the latter category at Cooksville, of the varieties Glen Mary, Premier and Red Gold, all three of which were affected, the last-mentioned variety apparently was much more susceptible than the other two. This was the only case encountered where there was an indication of a difference in varietal susceptibility to the disease. (A.A. Hildebrand)

Winter Injury. On the occasion of a visit to the St. Catharines Laboratory, Drs. J.B. Demaree and G.M. Darrow of the U.S. Department of Agriculture when shown the trouble that has been regarded as root-rot, inclined to the view that this condition rather than being due to the attack of parasitic organisms, was the result of winter injury to the crown (see Plant Disease Reporter 21:397). These investigators postulated that injury in the region of the cambium within the crown interferes with translocatory and other processes with consequent death of the roots. During the survey, the crowns of many hundreds of plants were examined. Internal discoloration of the crown of plants that have overwintered must be spoken of in relative terms as in the case of root-rot, because very few such plants had crowns free from discoloration. The great majority of overwintered plants showed crowns with internal discoloration varying from slight to severe. But root-rot is not necessarily correlated with internal crown discoloration. Recently some hundreds of current-season runner plants have been examined. In scarcely a single instance was discoloration of the crown noted, yet in some cases over 50 per cent of the plants examined showed typical root-rot.

There was some slight indication during the survey that plants in more protected situations showed less internal crown discoloration. As a consequence of the question of winter injury being raised, mulching and other experiments are being included in the St. Catharines program of investigations.

In a survey of the northern and central States, Drs. Darrow and Demaree were able to trace "red core" (Lanarkshire disease in Scotland) from Maryland, north through New Jersey and the Hudson valley, well into New York State. The disease had already been reported from Michigan and Ohio. It was not found in Ontario though a

great many roots of strawberry plants were examined especially in search for it. (A.A. Hildebrand)

Several plantings were moderately affected by root rot in Lulu Island, Hatzic and Mission, B.C. It was worst on Lulu Island, where the area in strawberries is low lying and inclined to be wet during the fall. (W. Jones)

VIRUS DISEASES. Since experimental work at St. Catharines, Ont. had demonstrated that three of the leading commercial varieties, under greenhouse conditions, were symptomless carriers of virus (Yellow Edge), these three varieties, namely, Glen Mary, Premier and Parson's Beauty, were given especially close inspection to see if, under field conditions, they might in any way show symptoms suggestive of virus. Not even in Parson's Beauty, in which variety R.V. Harris in 1933 had selected plants exhibiting in the field symptoms of Yellow Edge, could any suggestion of the presence of virus be noted.

June Yellows. In Fragaria chiloensis in the experimental plots at Vineland and in the varieties Blakemore, Brandywine, Olga Petrova, Premier and Kellogg's Premier in commercial plantations variously situated throughout Ontario, June Yellows, the real cause of which has never definitely been determined, was prevalent. (A.A. Hildebrand).