V. DISEASES OF FRUIT CROPS

APPLE

SCAB (Venturia inaequalis) was more prevalent than in 1938 in the Fraser Valley, B.C., but it was less general on Vancouver Island (W. Jones). Although weather conditions in May and June were ideal for scab infection in the North Okanagan and Salmon Arm districts, very little disease developed and 90% of the fruit at least was clean. Scab was exceedingly light in 1938 and it is thought that there was insufficient inoculum overwintering to cause infection this year (G.E. Woolliams). In general, scab was unimportant in the Niagara Peninsula, Ont. Some late infection of the fruit took place during rains in August, but it was of minor importance. The fruit of unsprayed McIntosh trees in the Laboratory plots, St. Catharines, showed 35% scab infection, 20% being very light, while the fruit of sprayed trees showed light scab infection, ranging up to 9%. Several cases of severe infection, traceable to poor spraying practises or to unusual or unfavourable conditions, were observed.

The first discharge of ascospores occurred on May 9, when the trees were in the pre-pink and pink stages. Primary infection was noted June 9. Weather conditions were unfavourable for infection in the spring; in consequence primary infection was light. Secondary infections began to appear at the end of June, but further development was checked by the weather until late August, when further light infections occurred (G.C. Chamberlain). In other parts of Ontario, apple scab was prevalent in unsprayed orchards. On unsprayed McIntosh trees practically 100% of the fruit were disfigured by scab. In well sprayed orchards, scab was kept well under control. (J.E. Howitt)

Ascospores matured in south-western Que., about the usual time, the trees being in the green tip stage. However, the first ascospore discharge did not occur until May 22-23, when the trees were in the pink stage, for no rain fell before this date. On the other hand, this dry period was followed by rainy weather, especially in the hilly section of Missisquoi district, where scab was kept under control only by frequent and thorough applications of spray. In some orchards, especially where the pre-pink spray was omitted, as many as 50% of the fruits were spotted. In all other districts, the crop was remarkably clean. (Fernand Godbout)

Scab was severe again in Eastern Que., particularly in orchards where late applications of lime sulphur were omitted. The disease was favoured by the extremely wet weather in late summer. First ascospore discharge took place on June 1; several discharges occurred subsequently, the last one July 17. Primary infection was noted on June 30 at Ste. Anne de la Pocatiere. The more susceptible commercial varieties showed the following percentages of fruit affected: McIntosh, 28%; Lobo, 24%; Canada Baldwin, 22%; Scarlet Pippin, 15%; Cortland, 15%; North Star, 15%; Wealthy, 14%; Melba, 13%. Lesser amounts of scab were observed on: Newtosh, 9%; Charlamoff, 7%; Miltosh, 5%; Keetosh, 5%; Hume, 4%; Duchess, 3%; Winton, 2%; Milwaukee, 1%;

Elmer, 1%. No scab was seen on: Afghanistan; Alexander; Manda; N.W. Greening; Pensaukee; Russett; Sandow; and Stonehenge. (C. Perrault)

First ascospore discharge occurred at Fredericton, N.B., on May 27. Although the ascospores were mature on May 18, conditions were unfavourable for spore discharge due to the lack of rain from May 9 to May 27. A heavy discharge took place on May 29, when the early varieties were in full bloom and most of the others were in the advanced pink stage. The last discharge occurred on June 8. Primary infection was observed on the leaves on June 22. Apple scab was very prevalent on unsprayed trees of McIntosh and Fameuse, although, in general, scab was more easily controlled than in 1938. (S.F. Clarkson)

The early part of the season was favourable for scab development in the Annapolis Valley, N.S., but dry weather in July, August and early September prevented further spread of the disease. The perithecia were mature early in May, but no ascospore discharge was recorded until May 18-19, when a moderate ejection took place. The main and most serious infection period was May 28-31. The trees were in the pink stage and new leaf growth was plentiful. A moderate infection period occurred on June 6-9. Subsequent minor discharges of ascospores were recorded until July 13.

Scab control was fair to good on the foliage and good on the fruit. Many of the earlier affected leaves dropped during the summer and ceased to be sources of inoculum. At harvest, 20-70% of the crop showed scab lesions on unsprayed trees. Less than 1% of the fruit was scabby on sprayed trees in many orchards. Late season infections were observed in a few instances. (J.F. Hockey)

In general, scab caused little damage in sprayed orchards in P.E.I. The fruit was rather severely infected in one or two orchards, where the first sprays were improperly timed. The main ascospore discharge took place on June 14. Orchards receiving the recommended sprays from that date on were practically free from scab. Others not receiving sufficient spray showed considerable leaf and fruit infection. It was particularly noticeable in one orchard of McIntosh. (G.W. Ayers)

FIRE BLIGHT (Erwinia amylovora) caused slight damage at Saskatoon, Sask. A severe attack, which required very heavy pruning to remove, was reported from Winnipeg, Man.; a slight infection occurred on crab apple at Morden. Twig blight was prevalent in many orchards throughout Ont. (J.E. Howitt). The disease was much less prevalent than usual in Lincoln Co. (G.C. Chamberlain). Fire blight was severe in a nursery of one to four year old stock of the Horticultural Division, Central Experimental Farm, Ottawa; some valuable breeding material was practically wiped out. This epidemic seemed to offer a clear-cut instance of the dispersal of inoculum by wind and rain. A row of large, old, severely infected crab apple trees stood but a short distance to the northwest of the nursery (F.S. Thatcher). To a casual observer fire blight appeared to be more than usually prevalent in Eastern

Ont., for the blighted twigs were conspicuous in both orchards and wild trees from the road. (I.L. Conners)

Fire blight was severe in southwestern Que. in small, poorly kept orchards where Alexander and certain varieties of crab apples were present (H.N. Racicot). In general fire blight was of little importance because Alexander, the most susceptible variety, has been nearly all cut down in the apple growing districts. This disease is observed mostly in home orchards outside these districts (F. Godbout). Very few orchards were free from fire blight around Quebec City. On the Island of Orleans, considerable loss was suffered in several orchards, nearly half the limbs and foliage being affected as well as the young fruits. The disease was apparently present in a few orchards in 1938 and it has spread rapidly to all orchards in the neighbourhood. (C. Perrault)

Less than 0.5% of the Wagner stock was affected by fire blight in a nursery in Annapolis Co., N.S.; 10% were affected in 1938. A trace was also found in McIntosh (J.F. Hockey). Fire blight was not seen in well cared for orchards in P.E.I., but it was destructive to hawthorns and in abandoned orchards. (R.R. Hurst)

APPLE RUST (Gymnosporangium Juniperi-virginianae) caused considerable damage in southwestern Ont. in 1939. Greening and Bladwin appear to possess some resistance, McIntosh was somewhat less resistant, while Wealthy, Starking (Red Delicious), Golden Delicious, Jonathan, King David, Melba, Duchess, and Rome Beauty appeared to be completely susceptible (L.W. Koch). Leaves of Betchels Crab heavily infected by this rust were received from Toronto; the tree was adjacent to infected red cedar. Red cedar was also found heavily infected in a neglected orchard near Picton, Ont., infection was just beginning to show on the apple. (I.L. Conners)

HAWTHORN RUST (Gymnosporangium globosum) was heavy on red cedar specimens collected by Mr. C.G. Riley, on a private estate near Hull, Que. A few old apple trees were planted in close proximity to the red cedar and were thought to be the alternate host rather than hawthorn, which was growing at some distance. (I.L. Conners)

QUINCE RUST (Gymnosporangium clavipes) was not controlled effectively by the regular spray programme against apple scab in operation below Quebec City, Que. Alexander, N.W. Greening, Yellow Transparent, and McMahon were among the most severely affected varieties at Ste. Anne de la Pocatiere this year (C. Perrault). A trace of rust was observed on Stark at Lakeville, N.S. (R.J. Baylis)

BLACK ROT (Physalospora Malorum) was general in an orchard at Pemberton Meadows, B.C. (W. Jones). Black rot was common in York and Queens Counties, N.B. At French Lake, infection was found on leaves of Crimson Beauty on June 8, when the trees were in full bloom. From 30% to 75% of the fruit, with an average of 45% was infected on September 11. The spray programme does not

control the disease (S.F. Clarkson). Affected fruit was brought in from Wood Islands, P.E.I. (R.R. Hurst)

POWDERY MILDEW (Podosphaera leucotricha) was fairly general on Vancouver Island and in the Fraser Valley, B.C.; the damage was moderate (W. Jones). Powdery mildew caused considerable russetting of the fruit in some orchards in the southern Okanagan, but it was slight to absent in most orchards. Immature perithecia were found on both the fruit and young suckers of McIntosh this fall (G.E. Woolliams). A scattered infection was seen on new growth of unsprayed Baldwin trees in June in Lincoln Co., Ont. (G.C. Chamberlain)

ANTHRACNOSE (Neofabraea malicorticis) was general and caused considerable damage in most orchards in the Fraser River Valley, B.C.; very little effort is made to control the disease (W. Jones). Anthracnose has recently been slowly increasing in the Salmon Arm area, especially on McIntosh, Rome Beauty, and Grimes. In some orchards, the majority of the trees have developed limb cankers. In the district as a whole, however, not over 5% of the trees would be affected. (G.E. Woolliams)

PERENNIAL CANKER (Neofabraea perennans Kienholz (Gloeosporium perennans Zeller and Childs) J.R. Kienholz (Jour. Agr. Res. 59:635-665. 1939) has described the perfect stage of Gloeosporium perennans.

EUROPEAN CANKER (Nectria galligena) was general on the King variety in an orchard in the Alberni district, B.C.; the damage was moderate. (E. White)

SILVER LEAF (Stereum purpureum). A trace was noted on the apple seedlings at the Station, Fredericton, N.B.; it was not as prevalent as last year (S.F. Clarkson). Silver leaf was quite common in some abandoned orchards in Kings Co., P.E.I. (R.R. Hurst)

DROUGHT SPOT, CORKY CORE and DIE-BACK (Boron deficiency). There have been no commercial losses from this disease since soil applications of boric acid were made to affected orchards in 1936 in the Okanagan district, B.C. The disease can only be found on check plots in the Kelowna Experimental Orchard. (H.R. McLarty)

Corky core was observed in apples from 2 orchards in Eastern Ontario. One grower reported that practically all his McIntosh apples had developed corky core and every apple in a basketful he submitted was so affected. (J.E. Howitt)

Cork disorders vary greatly in severity from season to season in Ontario. Although soil moisture is not directly responsible, it evidently greatly influences their prevalence and severity in a given season.

Average percentage of fruit affected on untreated trees:

Variety	1936	1937	1938	1939
McIntosh	85	0	46	58
Fameuse	72	0.33	18	19
Wealthy	75	0.85	6.5	12
Stark	37	0	8	29
Ben Davis	91	0	7	9
Northern Spy	51	0	2	

For these four years, cork disorders were at their peak in 1936, when rainfall was subnormal during the months of May, June and July. In 1937, moisture was more uniform throughout the season and cork disorders were much less severe. In 1938, a considerable percentage of fruit from untreated trees was affected, with another slight increase in 1939.

Incidence of Cork in Orchards Surveyed in Northumberland and Durham Counties

Year	No. of Orchards	Orchards with Cork %
1937	103	15
1938	57	42
1939	37	37.8

A single soil application of 1 lb. of borax or boric acid made in the fall of 1936 or in the spring of 1937, or spraying, in 1937, of the foliage at the calyx and second cover spray with 2.5 lb. of borax per 100 gallons of liquid effectively controlled cork disorders in 1937, 1938 and 1939.

Incidence of Cork Reported by Horticultural Inspectors in Orchards in Prince Edward County

No. Orchards Inspected	Orchards with Cork							
	Number				Percentage			
	1936	1937	1938	1939	1936	1937	1938	1939
148	69	4	5	35	42.6	2.7	3.3	23.6

Some of these orchards were treated with boron in 1937, but we have not detailed information. The trend in the different years is shown, however.

In Quebec no detailed records have been secured. Recommendations re boron applications have been generally followed and control has been good. From the few scattered samples that were sent in, it is obvious that cork was rather severe on some varieties such as Fameuse and McIntosh, where boron treatments had not been made. (H. Hill)

About 1,000 barrels of apples grown in York and Sunbury counties, N.B., were affected by cork. In one lot of 500 barrels of Cortland about 90% of the apples were affected. Both internal cork and corky core were found in Cortland while corky core only was present in McIntosh. The trouble was found in several orchards which had previously been free. The disorder was apparently more prevalent on account of the dry weather, which occurred throughout almost the entire growing season (S.F. Clarkson and J.L. Howatt). Drought spot was observed on individual trees at the Station, Kentville, N.S., and in different parts of the Annapolis Valley on Cox Orange, McIntosh and Rome Beauty. Corky core was severe on Fameuse at the Kentville Station. (J.A. Boyle)

CHLOROSIS (non-parasitic). The Olga crab apple was affected by a severe chlorosis at Beaverlodge and Edmonton, Alta.

BITTER PIT (non-parasitic) affected not over 5% of the fruit on the experimental trees of Cox Orange and Northern Spy at Summerland, B.C. Actually losses cannot be determined until the end of the storage period and even then it is difficult to get accurate figures. However, it is considered among the shippers to be one of the most serious diseases in the Okanagan Valley, especially on susceptible varieties - Northern Spy, Cox Orange, Newton Pippen (H.R. McLarty). Bitter pit affected 10% of the Baldwin fruit, 12% of Northern Spy and 3% of Delicious in the Laboratory orchard, St. Catharines, Ont. It was reported to be severe at Forest (G.C. Chamberlain). Stippen or bitter pit was observed on Baldwin and Northern Spy apples in many parts of Eastern Ont.; 25% of the fruit were affected on some trees (J.E. Howitt). Bitter pit was more prevalent and severe in fruit still on the tree in Ont. in 1939 than in the previous two years (See table below). Its appearance was not limited to any specific soil type, although it appeared to be most generally distributed on deep, heavy soils supporting vigorous trees. (H. Hill)

The Incidence of Bitter Pit on the Tree in Northumberland and Durham Counties

Year	Orchards surveyed	Orchards affected	
		Number	Percentage
1937	103	12	11.6
1938	57	20	35.0
1939	37	24	64.8

Bitter pit affected about 65% of the Baxter apples in Sunbury and Queens counties, N.B.; trace was noted in Wealthy (S.F. Clarkson). Bitter pit developed later than usual in the Annapolis Valley, N.S. It was first noticed in the orchard on Sept. 13. In 10 orchards examined Oct. 1-7, the average percentage of fruit affected was 7.2%, the highest 22%. (K.A. Harrison)

MOSAIC (virus). A single Delicious tree which was reported last year, is the only one known to be affected in the Okanagan district, B.C.(T.B. Lott)

CROWN ROT (cause unknown) is the most serious apple tree disease in the Okanagan valley, B.C., and it annually takes a heavy toll. A number of orchards were seriously affected in the Oyama district this year and in two at least one third of the trees were diseased. The abnormally high incidence of the rot in Oyama was definitely associated with an increase in the amount of irrigation water used in that district coupled with a poor system of water distribution. Crown rot is not to be confused with the collar rot of R.C. Baines (Jour. Agr. Res. 59: 159-184. 1939). The latter disease is an above-ground rot affecting the trunk and main limb crotches, while crown rot, on the other hand, affects the tree crown just below the surface of the ground and usually extends down the main roots. We have substantial evidence that, at least, some of our crown rot is caused by Phytophthora sp. (probably Phytophthora Cactorum of Ashby). This is particularly interesting since Baines has found that his "collar rot" is caused by a similar organism. (R. Fitzpatrick)

ROT due to Fusarium sp., Botrytis cinerea, and Trichothecium roseum was noted in orchards in York Co., N.B. The latter was found following scab at Charlottetown, P.E.I.

BITTER ROT (Glomerella cingulata) affected 10% of the apples from McIntosh and Fameuse trees showing winter injury in an orchard in York Co., N.B. (S.F. Clarkson and J.L. Howatt)

STORAGE ROTS at the Station, Fredericton, N.B., were principally due to 3 organisms as follows: Penicillium sp. caused 50% of the rot, Gloeosporium album 40%, and Alternaria Mali, 5%. (S.F. Clarkson)

TWIG BLIGHT (Nectria cinnabarina). A trace was noted on a few trees of Fameuse at Keswick Ridge, N.B. (S.F. Clarkson)

Phomopsis sp. was found associated with dead branches and twigs in Carleton and York Counties, N.B.; infection was slight (S.F. Clarkson). A canker (Phomopsis sp.) affected 1% of newly planted seedlings in an Annapolis Valley nursery in N.S. (J.F. Hockey)

HEART ROT (probably a member of the Polyporaceae) is slight in the southern Okanagan Valley as a whole; the disease is usually confined to certain orchards or sections of orchards, where several trees in a block may be affected. (G.E. Woolliams)

A trace of Schizophyllum commune was noted on Fameuse trees that had suffered winter injury in Queens Co., N.B. (S.F. Clarkson)

WATER CORE (non-parasitic). A trace was observed in McIntosh in York and Queens Counties, N.B. (S.F. Clarkson)

HAIL INJURY occurred over much of the orchard area in the Saint John River Valley, N.B.; 75% of the fruit as damaged in the Station orchard, Fredericton, on July 12. (S.F. Clarkson)

LEAF SPOT (Coniothyrium pyrinum) was moderate on the hybrid, Rosy Reoka, at Morden, Man.

SPRAY INJURY. Injury from lime sulphur was much less severe in south-western Quebec than usual. Severe burning was noticed in a few orchards only early in the growing season. Damage was apparently due to poor spraying methods, particularly in drenching the trees. Russetting of the fruit was observed in an orchard at Oka where a copper oxychloride spray was used previous to the calyx application (F. Godbout). Russetting was severe in one orchard in N.B., where Bordeaux mixture 3-10-40 was applied in the calyx stage; pressure was insufficient to give a fine spray particle. In general, little russetting occurred. A trace of injury from lime sulphur was noted at Gagetown (S.F. Clarkson). Russetting of fruit was very slight in the area about Kentville, N.S. Cox orange in the plots was slightly russetted. Typical lime sulphur injury was observed on the foliage in a spray plot at Kentville, where the trees were sprayed with a lime sulphur-catalytic sulphur spray mixture under humid weather conditions; the damage was negligible. A slight amount of arsenical injury of the calyx end type was noted on several varieties in the spray plots (J.A. Boyle). A spotting of the bark was observed on March 30, on two-year-old wood from an orchard at Rockland, N.S. Delicious and Golden Russett were severely affected. The injury was probably caused by D.N.T. oil applied in April, 1938 (J.F. Hockey). Typical lime sulphur injury was observed at Charlottetown, P.E.I. (R.R. Hurst)

APRICOT

FRUIT SPOT (Coryneum Beijerinckii) affected 5% of the fruit at Creston, B.C. (G.E. Woolliams)

FRUIT and LEAF SPOT (cause unknown) was unusually severe in the southern Okanagan, B.C., this year. It was formerly considered to be a form of Drought Spot caused by a deficiency of boron, but we are now certain that this is not the cause. It is the most serious and virtually the only fruit spot of apricot in this district. (R. Fitzpatrick)

BLACKBERRY

ORANGE RUST (Gymnoconia Peckiana) affected 10% of Eldorado in a planting in Lincoln Co., Ont.

FROST caused considerable injury to the new growth in some plantings of blackberry, loganberry, and boysenberry on Vancouver Island, B.C., in May. (W.R. Foster)

CHERRY

SHOT HOLE (Higginsia hiemalis (Cylindrosporium hiemale) was severe on Marjolet and Guigne Rivers varieties at the Sidney Station, B.C. (J.E. Bosher). Shot hole was general late in the season in the younger sour cherry orchards in Lincoln Co., Ont., where the full spray programme was omitted; scattered infections only occurred on older trees (G.C. Chamberlain). Shot hole caused slight to moderate damage on unsprayed trees in N.B. Infection was a trace to heavy in Queens Co., P.E.I.

SHOT HOLE (Coniothyrium sp. associated) was severe at Brandon, Man.; there was no evidence of Cylindrosporium. (W.L. Gordon)

SHOT HOLE (physiological) was severe on 2, moderate on 8, slight on 49, and a trace on 209 out of 3,047 trees surveyed in the Okanagan Valley, B.C., in 1939. (T.B. Lott)

FALSE SHOT HOLE (?virus) was found here and there throughout a 6-year-old sour cherry orchard at Virgil, Ont.; the leaves were stunted and dried up, while some showed distinct rings. (G.H. Berkeley and H.T. Gussow)

BLACK KNOT (Dibotryon morbosum) was so abundant in a small young sour-cherry orchard in Queens Co., P.E.I., and the knots were so located that pruning was not feasible and the trees had to be cut down (R.R. Hurst). A specimen of black knot on Prunus demissa was collected at Cawston, B.C., by Mr. R.P. Murray. This is the first record, of which I am aware, from the Dry Belt. (G.E. Woolliams)

BROWN ROT (Sclerotinia americana) was severe in a few home orchards in the Chilliwack area, B.C.; the disease was more general and severe than usual due to continuous rains in June (W. Jones). Brown rot was severe in a sweet cherry orchard at Southport, P.E.I.; in previous years the infection was slight in this orchard. (G.W. Ayers)

BLOSSOM BLIGHT (Sclerotinia cinerea) was severe on several varieties in the Station orchard, Sidney, B.C., while it was moderate in the Chilliwack area. (J.E. Bosher)

POWDERY MILDEW (Podosphaera Oxyacanthae) was rather general in several orchards near Lake Ontario in Lincoln Co., Ont. (G.C. Chamberlain)

YELLOW LEAF (non-parasitic) was prevalent around Fenwick and Fonthill, Ont., but was less below the escarpment; in general, it was less prevalent than in 1938. (G.C. Chamberlain)

DIE-BACK (cause unknown). A condition characterized by a delay in leafing out, and stunted variously mottled leaves was found in Lincoln Co., Ont. Later the leaves showed necrotic spots, which drop out. The leaves fall and the twigs die back. This condition was observed in 3 widely separated orchards, the trouble being scattered in the orchards. Late in the season

new, apparently normal leaves developed at the bases of the dead twigs and the trees appeared to recover. Its possible virus nature is being investigated. (G.C. Chamberlain)

CHERRY VIRUS DISEASE. A disease which caused delayed maturity, a tendency towards off-colouring and off-shape and bitterness in flavour in the fruit was found in an Olivet orchard, near Saanichton, B.C. The foliage, however, was almost normal in appearance, although there was a tendency for the leaves to be abnormally leathery to the feel and to develop red pigmentation, especially when transferred to Mazzard seedlings. Cross and longitudinal sections of the stems revealed marked necrosis of the vascular system in the advanced stages of the disease, but it was often confined to one side of the stem.

The disease appeared to be highly infectious to judge by the spread in the past four years. Although the disease appears to be most serious in the Olivet variety, Morello trees are likewise affected.

The disease was readily transferred to normal Olivet trees by budding. One year after the buds were inserted the characteristic symptoms appeared. In addition to the symptoms above described, there was a tendency for clusters of small leaves to appear on the trees budded with diseased material.

On Mazzard seedlings artificially infected with the disease the most conspicuous symptom was the red pigmentation, especially along the veins on the underside of the leaves. Recovery has not been observed. The disease on the inoculated trees gets steadily more severe, until finally the tree bears hardly any leaves or fruit. (W. Newton)

SILVER LEAF (Stereum purpureum) was moderate in sour cherries near Orwall, P.E.I. (R.R. Hurst)

WOOD ROT (Armillaria mellea) killed a few trees at the Station, Sidney, B.C. (W. Jones)

LITTLE CHERRY (cause unknown) is a serious disorder affecting cherry, especially the Lambert variety, about Nelson, B.C. Loss varies from 5% to 75% of the crop in different orchards. (G.E. Woolliams)

MOTTLE LEAF (virus) was not observed during the survey of 3,047 cherry trees in the Okanagan Valley, B.C. (T.B. Lott)

INTERVEINAL MOTTLE (physiological) was observed as follows: Trace on 221 trees, slight on 171, moderate on 39, and severe on one out of 3,047 trees surveyed in 1939 in the Okanagan Valley, B.C. (T.B. Lott)

RING SPOT MOTTLE (physiological) was observed during the same survey as follows: Trace on 34 trees, slight on 32, moderate on 10, and severe on one. (T.B. Lott)

CRINKLE (genetic weakness). A total of 3,047 cherry trees of all varieties were surveyed in 1939 in the Okanagan Valley, B.C. The results are given in Table 12.

When the whole tree was affected, the damage was estimated as 20-95%, while in trees affected in part, damage was 1-50%. One of the trees affected in part showed a white form of crinkle, which has been observed in Black Tartarian only. Crinkle was not observed in other than the Bing and Black Tartarian varieties. (T.B. Lott)

Table 12. Occurrence of Crinkle in the Okanagan Valley, 1939

Variety	Whole tree affected	Part of tree affected	Suspected of crinkle
Bing	47	9	2
Black Tartarian	13	3	0
Undetermined (Probably Bing)	9	1	1
Total	69	13	3

CRANBERRY

RED GALL (Synchytrium Vaccinii) caused severe damage in a single bog at Port Mouton, N.S. Infection of the unopened terminal buds took place previous to or on May 23. Infection occurred again on July 5 and 6, when the bog was reflooded for 48 hours, and was evident on July 15. The disease was present on Kalmia latifolia, Chamaedaphne calyculata, Rhodora canadense, Andromeda glaucophylla, and Ledum groenlandicum (R.J. Baylis and J.W. McLellan). Specimens of a Synchytrium on Rubus hispidus, Amelanchier sp., Ilex sp. and Spirea sp. were also collected in the same bog, and while it might be referred to S. Vaccinii, Dr. Groves believes that it agrees better with the closely related species, S. aureum. (I.L. Conners)

LEAF SPOT (Gibbera compacta) is common everywhere in N.B., but the damage is insignificant. (J.L. Howatt)

CURRANT

WHITE PINE BLISTER RUST (Cronartium ribicola) was general in the Fraser River Valley, B.C. (W. Jones). The amount of rust present in the variety plots of the Horticultural Division, Central Experimental Farm, has been recorded by Mr. H.J. Read for the past 5 years, 1935-39. Black currants were considerably to badly affected in 1935 and 1936, while in 1939 the infection was slight. Red and White currants, which showed considerable rust in 1935 and 1936, were all clean. In fact, there has been a progressive reduction in

the amount of rust, particularly in the last two years. Previous to 1937 no special attention was given to spraying the currants; as a rule, they received an application of Bordeaux containing poison in late May or early June, and unless the currant worm became troublesome, they were not sprayed again. Since 1937, 3-6-40 Bordeaux plus 1 quart of nicotine sulphate was applied on the following dates: June 5, 13, 25, 1937; May 5, June 1, 11, 20, 1938; and May 13, 18, 23, June 2, Aug. 2, 1939. It has been found that applications of Bordeaux after June 5, deposit a residue on the fruit, that does not wash off before picking time. Due to an outbreak of green aphids this year, the bushes were sprayed with a solution of nicotine sulphate and soap on June 20. According to Mr. Read the programme followed this year is the most satisfactory yet devised.

By controlling the rust, spraying appears to have led to a definite improvement in yields of the highly susceptible black currants (Table 13). This fact is best appreciated by comparing the percentage yields of the black currants in the last three years, since a definite spraying programme

Table 13. Yield of Principal Varieties of Currants Under Test in the Horticultural Plots, Central Experimental Farm, Ottawa, 1935-1939.

Year	Yield of Currants			
	Black		Red & White	
	Actual 1/	Percentage 2/	Actual 1/	Percentage 2/
	lb.	%	lb.	%
1935	5.32	100	25.4	100
1936	3.12	60	15.2	60
1937	6.89	130	18.1	71
1938	5.91	111	16.0	63
1939	8.66	163	20.9	82

1/ Average yield of 4 plots of 15 varieties; each plot contains 3 bushes.

2/ Yield expressed as a percentage of the yield in 1935.

was commenced, with the corresponding figures for red and white currants. Indeed, the black currants have yielded nearly twice as well as the red and white varieties, although the actual yield of black currants is much less than that of the red and white, and the yield fluctuates widely from year to year. (I.L. Conners)

Black currant bushes imported in 1938 and planted at Ste. Famille, Island of Orleans, Que., were so badly rusted on Sept. 22 that "the buds were developing prematurely and in all probability they will freeze during the approaching winter. White pines occur in the neighbourhood. The same condition was found in other gardens in the area and I fear that the growers

will obtain nothing on account of the rust" (Omer Caron). A heavy infection was also observed at Macdonald College, Que. This rust was prevalent in N.B.; premature defoliation was observed in Restigouche and Charlotte counties (S.F. Clarkson). The rust was heavy in several gardens on red and black currants in P.E.I.

ANTHRACNOSE (Depranopeziza Ribis (Gloeosporium Ribis) was slight on most varieties at Lacombe, Alta. It was common and heavy on the lower leaves of red currant at Muenster, Sask.

POWDERY MILDEW (Sphaerotheca mors-uvae) was present as usual in the University plots, Saskatoon, Sask.; the damage was slight. The plants are not sprayed. (T.C. Vanterpool)

SEPTORIA LEAF SPOT (Mycosphaerella Ribis (Septoria Ribis) was generally slight at Morden, Man.

GOOSEBERRY

POWDERY MILDEW (Sphaerotheca mors-uvae) was reported to have caused severe damage to leaves and fruit at Medicine Hat and Smoky Lake, Alta. Infection was slight on the leaves at Beaverlodge and moderate at Lacombe. Powdery mildew was severe at Saskatoon, Sask., and diseased specimens were received from Rosthern. The disease was severe on the fruit sent from St. Pascal, Que. (D.B.O. Savile). Traces were found in a garden at Charlottetown, P.E.I.

RUST (Puccinia Pringsheimiana) was heavy on the berries at Wawota, Sask.

GRAPE

DOWNY MILDEW (Plasmopara viticola) was especially abundant on the petioles and larger veins of certain varieties at Macdonald College, Que., causing the wilting and death of the leaves. The disease was not common on the blades. (I.H. Crowell)

BLACK ROT (Guignardia Bidwellii) would apparently destroy the entire crop of 22 acres at St. Thomas, Ont., according to a correspondent. (F.S. Thatcher)

DEAD ARM (Fusicoccum viticola) was observed in several vineyards mostly of Concord in Welland Co., Ont.; it was more prevalent than for several years, up to 10% of the vines being affected. (G.C. Chamberlain)

LOGANBERRY

DRY BERRY (Haplosphaeria deformans) was general but less prevalent on Vancouver Island, B.C., than in 1938, possibly due to the dry early spring checking infection. (W.R. Foster)

PEACH

LEAF CURL (Taphrina deformans) infection was very slight this year in the Niagara Peninsula, Ont.; the damage was negligible (R.S. Willison). Two trees were severely affected at Gilbert Cove, N.S. (J.A. Boyle)

BROWN ROT (Sclerotinia americana). In the Laboratory orchard, St. Catharines, Ont., brown rot was serious on unsprayed Rochester trees - a probable consequence of blossom blight (q.v.) - but it was of less importance in late varieties. Satisfactory orchard and post-harvest control was obtained with the spraying schedule recommended. (R.S. Willison)

BLOSSOM BLIGHT (Sclerotinia americana). It was estimated that 10% of the blossoms were blighted on the unsprayed check trees of Rochester in the Laboratory orchard, St. Catharines, Ont. The average number of affected blossoms per tree was determined by count in each block of six, 3-year-old trees as follows: Lime sulphur 1:40, 59.3 blossoms (43.4% control), wettable sulphur 13.3, (87.2% control) and check, untreated 104.3 (no control). Some blossom blight occurred in the other varieties in the orchard, but it was considerably less than in Rochester. (R.S. Willison)

"CANKER" (Sclerotinia americana). One or two cases of "canker" were observed in the Laboratory orchard, St. Catharines, Ont.; in which current season's twigs of Rochester were girdled by a lesion, on which S. americana was fruiting. The lesions were centred around the leaf base. The leaf presumably came in contact with a rotting fruit. (R.S. Willison)

POWDERY MILDEW (Sphaerotheca pannosa) was slight compared with previous years in the southern Okanagan Valley, B.C. Powdery mildew was observed in several orchards in Lincoln Co., Ont.; about 5% of the fruit was spotted.

YELLOWS and LITTLE PEACH (virus). According to G.G. Dustan and from my own more limited observations, the number of trees affected by yellows or little peach was markedly less than last year. The tabulation below gives the number of trees found affected by yellows and little peach in the last three years in the Niagara Peninsula, as the result of the survey conducted by Mr. G.G. Dustan.

County	Township	Number of tree affected 1937	1938	1939
Welland	Stamford	88	96	81
Lincoln	Niagara	670	350	86
"	Grantham	244	42	22
"	Louth	496	x168	276
"	Clinton	580	502	162
"	North Grimsby	x748	1031	342
Wentworth	Saltfleet	x214	793	226
	Control Zone 1/	706	434	72
	TOTALS	3746	3416	1267

x Surveys incomplete

1/ The control zone is a 2 square mile block in North Grimsby Township rigorously inspected by G.G. Dustan with my occasional assistance.

This reduction is probably due to the scarcity of the vector, Macropsis trimaculata in the summer of 1938, as reported by the Entomologists. (R.S. Willison)

The leaf hopper, Macropsis trimaculata, varies greatly in abundance from year to year in the Niagara Peninsula, Ont. The population of Macropsis trimaculata during the four years, 1936 to 1939 inclusive was largest in 1936. The insect was found in considerable numbers on wild and cultivated plum, and a few were feeding on peach. Prior to 1936 for four or more seasons very cursory observations indicated that the insect was quite common on wild plum and to a lesser extent on peach. In 1937, Macropsis trimaculata was so scarce in the Niagara Peninsula that continued search in all the localities where the insect had been abundant the previous year, as well as in many new areas resulted in the collection of approximately 25 specimens. The leaf hopper simply was not present. In 1938, Macropsis trimaculata was again extremely rare, but in 1939, the insect increased slightly in a few localities, although still very scarce. These specimens were found on wild plum only (T. Armstrong). Macropsis trimaculata has not been recorded from Lambton or Kent counties, Ont., or from B.C. (C.R. Twinn)

No virus diseases were observed on peach in the Okanagan Valley, B.C., in 1939, when 1,257 trees were surveyed. (T.B. Lott)

SUTURE SPOT (cause unknown). Several fruits were found with an elongated spot along the suture in an orchard at Ridgeville, Ont. The spot was bright red, brownish or abnormally green with a red border. The flesh below the spot was brownish or discoloured in the shape of a wedge, sometimes reaching the pit. This spot corresponded closely to the description of a

spot in peaches in orchards said to be affected by smoke in 1937 and 1938. In this case, however, smoke damage can be ruled out. The crop was harvested before the condition was brought to our attention, but no apparent leaf abnormalities were present on one tree, under which affected fruit were found. (R.S. Willison & G.H. Berkeley)

POTASH DEFICIENCY was found in many, particularly young, orchards in Lincoln Co., Ont., following hot, dry weather in June. (G.C. Chamberlain)

PEAR

SCAB (Venturia pyrina) was general and caused moderate damage on Vancouver Island and in the Fraser Valley, B.C. Some 15-20% of the fruit were infected in an orchard of Flemish Beauty in Lincoln Co., Ont. Scab was moderate to severe on unsprayed trees in York Co., N.B. Scab was slight to moderate in an orchard at Southport, P.E.I., although the trees had been sprayed; it was quite common this year throughout the province.

FIRE BLIGHT (Erwinia amylovora) caused little damage in Okanagan Valley, B.C. Traces were observed in Queens Co., P.E.I.

RUST (Gymnosporangium clavariaeforme) severely infected the fruit, twigs, and spurs of young unsprayed pear trees at Kentville, N.S. Juniper was growing within 200 yards of the trees. (J.F. Hockey and I.L. Conners)

STONY PIT (virus) appears to be present in all Bosc trees at the Experimental Station, Sidney, B.C.; about 10% of the fruit was affected. Stony pit has also been found in a considerable number of Clairgeau and D'Anjou trees and in a few of Bouscock and Bartlett (E.M. Straight). Stony pit rather severely affected 7 Bosc trees, and was found in 14 others out of 55 examined in the southern Okanagan; the trouble was severe in one Winter Nellis tree, and present in 4 others out of 6 examined. The condition was of little importance in any of 263 Barlett, 22 Flemish and 13 D'Anjou trees inspected. (G.B. Lott)

POWDERY MILDEW (Podosphaera leucotricha) was general on most varieties of commercial pears in the southern Okanagan district, B.C., wherever sprays were not applied. (G.E. Woolliams)

LEAF SPOT (Entomosporium maculatum) was heavy at Brackley Beach, P.E.I. (G.W. Ayers)

DROUGHT SPOT (boron deficiency). Most of the pear orchards in the Okanagan Valley, B.C., have been treated with boric acid, consequently boron deficiency diseases have been eliminated. (R. Fitzpatrick)

CHLOROSIS (?iron deficiency). Lime induced chlorosis (iron deficiency) occurs annually on certain types of soil in the Okanagan Valley, B.C. Iron salt injections have not given consistent results; sprays with solutions of iron salts promise to be more effective, but this work is still in the experimental stage. (R. Fitzpatrick)

POTASH DEFICIENCY was rather severe in a young orchard of Bartlett in Lincoln Co., Ont. The leaves on the affected trees showed a purplish discoloration with an upward rolling followed by scorch and death of leaves and drying out and death of twigs. Interplanted corn and nearby peach trees were similarly affected. (G.C. Chamberlain)

BLACK END (cause unknown) is a physiological disorder, which is most serious on Bartlett in the Okanagan Valley, B.C. At one time it was thought to be a form of drought spot, but this has been disproved. (R. Fitzpatrick)

PLUM

BLACK KNOT (Dibotryon morbosum) was conspicuous in one orchard requiring considerable pruning on Reine Claude in Lincoln Co., Ont. The disease can be found rather frequently in wild plums and individual trees in gardens (G.C. Chamberlain). Black knot was general and severe on unsprayed trees in N.B. It was also severe in Queens Co., P.E.I.

PLUM POCKETS (Taphrina Pruni) was reported in an orchard at Knowlton, Que. Specimens were also received from Arthabaska, Quo., and Greenwich, N.S.

SHOT HOLE (Higginsia prunophorae (Cylindrosporium prunophorae). The Combination and Santa Rosa varieties have been severely affected for several years at the Station, Sidney, B.C.; it was also severe on Mallard and Burbank (J.E. Bosher). Shot hole was severe at Brandon, Man., while infection was slight to moderate on some trees at Morden. The disease was severe on unsprayed trees throughout N.B. Traces were observed in Queens Co., P.E.I.

BROWN ROT (Sclerotinia americana). A trace was noted in Westmorland Co., N.B. Brown rot affected 20% of the fruit of Green Gage trees in an apple orchard at Greenwich, N.S., while the fruit of Lombard trees in the same orchard were clean. The trees were sprayed with the standard orchard fungicides (J.A. Boyle). About 30% of the blossoms were blighted and many of the newly formed plums were rotted in P.E.I., due to heavy rains and humid weather. Many growers removed these and no further spread took place during the dry summer. The fruit was harvested and marketed with little or any brown rot developing. (G.W. Ayers)

PRUNE MOSAIC (Prunus virus 6) was first observed in 1937 on Damson top worked with Italian Prune. Tissue transfers were made at that time, but there were no signs of transmission to peach until 1939, when a few leaves on the

inoculated tree developed a slight mottle suggestive of vein banding. Later angular necrotic spots with red borders developed. The disease on the prune was identified by Dr. E.M. Hildebrand as due to this virus. In one of the orchards half the Damson trees were top worked with Grand Duke, which displayed no symptoms of disease. The trouble is being studied further on the plum and peach. (R.S. Willison)

PLUM MOSAIC (?virus) was first observed in Sept. 1938, in Shiro trees, 30 years old, in Lincoln Co., Ont. The grower first noticed it in 1937. Three years ago the orchard was top worked with First, in which symptoms are faint. It would appear that the disease was introduced by grafting, for it has been found in both Shiro and First in a second orchard, from which the First material was secured to make the grafts in the former. The disease has also spread in the former because trees not top worked now are affected. The virus nature of the disease was demonstrated by inoculations made in the autumn, 1938, to peach which exhibits a distinct line pattern and minute ring spotting. Symptoms appear on the early leaves only, and a pronounced oak leaf pattern is also present on plum. Growth and fruit so far have appeared to be little affected. This disease is distinct in symptoms from plum and peach mosaic, although further investigations may prove it to be a form of the latter. (R.S. Willison and G.H. Berkeley)

CHLOROSIS (suspected virus). In 1937, tissue grafts from an Imperial Epineuse plum in the Laboratory orchard, St. Catharines, Ont., showing slightly dwarfed, somewhat chlorotic leaves were made on four peach seedlings. One of these seedlings showed in 1939, a ring-spotting and line pattern wider than and distinct from those described for the Shiro trouble (q.v.). Further work is in progress. (R.S. Willison)

PEACH YELLOWS (virus) was found affecting about 50% of the trees in a plum orchard in Wentworth Co., Ont.; the foliage was off colour and the fruit was ripening prematurely. (R.S. Willison)

LITTLE PEACH (virus) affected about 25% of the Burbank trees in an orchard in Lincoln Co., Ont.; the foliage was chlorotic, the leaves were cupped downward slightly, and the fruit matured 2-3 weeks late. (R.S. Willison)

QUINCE

CORKY CORE (boron deficiency). About 25% of the fruit were affected in a 6 quart basketful picked in the orchard at the Station, Kentville, N.S. The symptoms were very similar to those seen in Wolf River apples affected by drought spot. (K.A. Harrison)

RASPBERRY

ANTHRACNOSE (Elsinoe veneta) was found in plantations of Newman and Lloyd George at Sumas and Agassiz, B.C., respectively (W. Jones). Anthracnose was found on Taylor and Marcy in several nurseries in Ont. (G.C. Chamberlain). Traces of anthracnose occurred on Lloyd George and Viking in a planting in Queens Co., P.E.I. (R.R. Hurst)

SPUR BLIGHT (Didymella applanata) was prevalent on Latham and Everlasting at Sumas, B.C., in March. The latter variety was severely affected and seems more susceptible than other commercial varieties in B.C. (W. Jones). Spur blight was common in York Co., N.B.; it caused slight to moderate damage (S.F. Clarkson). Spur blight damage varied from slight to severe in P.E.I.

MOSAIC (virus) is common in Alta.; several plants were affected at Lacombe. About 10% of the plants were affected in a garden at Muenster, Sask. Mosaic can readily be found in most commercial plantings of Cuthbert and Viking in Ont.; infection ranged from a trace to 30%. Most nursery plantings of Cuthbert had small percentages of mosaic and in one nursery planting of Viking at Bowmanville, 30% of the plants were affected. Mosaic was found for the first time in the comparatively new Taylor variety (G.C. Chamberlain). Mosaic was noted in several varieties in York Co., N.B. Mosaic affected 60% of the plants in a Viking planting and 35% in one of Newman (S.F. Clarkson). Mosaic was found on Latham, Cuthbert and Viking in P.E.I.; in one planting 75% of the plants were affected. (R.R. Hurst)

MOSAIC (virus) is fairly prevalent in the Fraser Valley, on Vancouver Island, and in the Interior of B.C. Infection ranged from 5 to 50%. It is most serious in Lloyd George (W. Jones). Although mosaic has not been reported to any extent in B.C. in recent years, it would appear that it is much more prevalent than has been supposed, for, according to Dr. Berkeley, mosaic was present in all varieties examined by him in B.C. in 1935 and in one plantation at Salmon Arm 100% of the plants were affected. While Dr. Berkeley did not consider it the chief cause of the decline of raspberries in B.C. at that time, he was of the opinion that there was sufficient mosaic present in some plantations to warrant serious attention being given to the disease. (I.L. Conners)

LEAF CURL (virus). A trace was found at Lacombe, Alta. Leaf curl was encountered in several commercial plantings of Cuthbert in Ontario and in one, 15% of the plants were affected. Leaf curl was found for the first time in the Taylor variety (G.C. Chamberlain). A trace of leaf curl was noted in York Co., N.B.

YELLOW BLOTCH CURL (virus). Most Cuthbert nursery plantings show small percentages of yellow blotch curl in Ont. Its natural occurrence was noted for the first time in Viking and Taylor (G.C. Chamberlain). Yellow blotch curl was also reported in B.C. by Mr. W. Jones in 2 Cuthbert plantings, approximately 4% of the plants being affected. Whether the disease is identical with yellow blotch curl remains to be established. (I.L. Conners)

CANE BLIGHT (Leptosphaeria Coniothyrium) affected all the hills of Cuthbert in a plantation at Mission, B.C. The disease is more general in the Cuthbert than in other varieties and is often associated with lesions on the canes caused by yellow rust. The percentage of hills affected is usually low (W. Jones). Cane blight caused the death of 20% of canes in a planting of Cuthbert and over 50% in a Latham planting in Norfolk and Wentworth Counties, Ont., respectively; in both places the rows were thick and cultural practices were poor (G.C. Chamberlain). Cane blight was severe in some gardens on Viking about Charlottetown, P.E.I. According to Mr. G.C. Chamberlain the canes had already been weakened by the winter. (R.R. Hurst)

ASCOSPORA CANE SPOT (Ascospora Ruborum). Raspberry canes received from Agassiz, B.C., showed numerous lesions of Hendersonia Rubi. On account of the abundance of teliospores of Phragmidium Rubi-Idaei on the stems, it is suspected that the cane spot followed the rust. The symptoms agreed well with Zeller's description (Mycologia 17:33-41. 1925). No Leptosphaeria Coniothyrium was found. (D.B.O. Saville)

CROWN GALL (Phytomonas tumefaciens) was found on a few plants in Agassiz, B.C. (W. Jones). A shipment of raspberry canes received at Edmonton, Alta., in the fall of 1938 from a Minnesota nursery developed crown gall swellings on 68% of the canes by the following spring, when it was time to plant them. As many as 15 galls of all sizes occurred on some canes. Although crown gall has been observed previously in the experimental plots at Edmonton, where it was probably introduced on imported stock, it has not been observed or reported elsewhere in Alta. (G.B. Sanford). A trace was seen on Viking in a garden at Charlottetown, P.E.I.

YELLOW RUST (Phragmidium Rubi-Idaei) caused slight damage in commercial plantings in B.C., but it is prevalent in all Cuthbert and Viking plantings visited. At the Agassiz Farm, rust infection was moderate on Cuthbert, Viking, Herbert, Rochesters Red; slight on Winona; trace on Newman, Baumforth Seedling; and absent on Lloyd George, Latham, Franconia, Count, Chief, Ontario, Marcy, Taylor, Indian Summer, Denmark, and Norfolk Giant. Lesions on the young growing canes at the soil level develop into small oval cankers and may be followed by cane blight. Rust caused severe damage in a Herbert plantation at Terrace about 80 miles east of Prince Rupert according to Mr. J.D. Menzies. (W. Jones)

LATE RUST (Pucciniastrum americanum) occurred in variable amounts in many plantings of Viking in Central Ont.; it causes yellowing and scorch of the leaves and premature defoliation (G.C. Chamberlain). Leaves and fruit on an everbearing variety severely affected by rust were received from the Gatineau district, Que. (I.L. Conners). Late rust damaged severely the fruit of Viking and Newman in the same plantation in York Co., N.B., as last year (S.F. Clarkson). A slight attack of rust occurred in Queens Co., P.E.I., on Viking, where it was destructive last year; the grower has not removed the blue spruce from the area. (R.R. Hurst)

POWDERY MILDEW (Sphaerotheca Humuli) was most prevalent and severe on Latham east of Toronto, Ont., this year. On the whole it was probably less prevalent than in 1938. One 4-acre patch at Woodstock in an unfavourable location was severely affected in July; new growth was seriously stunted and infection occurred on the fruit (G.C. Chamberlain). Powdery mildew was present earlier than usual on Latham in Western Que. (H.N. Racicot)

DECLINE and DIE BACK (Armillaria mellea). Several plants were affected in a Cuthbert planting at Hatzic, B.C. (W. Jones)

WILT (Verticillium sp.) was not common or serious in the Niagara Peninsula, Ont., this year; 1% of the plants were affected in one planting of Viking. (G.C. Chamberlain)

SEPTORIA LEAF SPOT (S. Rubi) was general and conspicuous in a planting of Marcy at Stayner, Ont. The disease is common, particularly on Viking. (G.C. Chamberlain)

SCORCH (potash deficiency) was moderate on Brighton in a planting in Lincoln Co., Ont.

STRAWBERRY

LEAF SPOT (Mycosphaerella Fragariae) was fairly general and caused slight damage on Vancouver Island and in the Fraser Valley, B.C. In the plots at Agassiz, the varieties most severely affected were Lavergne, Simcoe, and Louise, while only a trace occurred on British Sovereign and Marshall (W. Jones). Leaf spot was common throughout N.B.

Leaf spot infection varied widely with the variety in N.S. At Kentville, Glen Mary and Abbot were the most severely spotted, while Premier was relatively free from the disease (D. Creelman). Leaf spot was heavy on Senator Dunlop near Montague, P.E.I. (R.R. Hurst). A slight infection was noted at Macdonald College, Que.

POWDERY MILDEW (Sphaerotheca Humuli) caused damage in the Horticultural plots, Saskatoon, Sask., according to Dr. C.F. Paterson. Traces were noted in 2 plantings near Montague, P.E.I.

LEAF SCORCH (Diplocarpon Earliana) was general on British Sovereign, the most susceptible commercial variety, on Vancouver Island and in the Fraser Valley, B.C., and it caused moderate damage in some plantings at Agassiz, the disease was moderate on British Sovereign, Cartier, Kawano, and Saito. At Sidney, it was severe on British Sovereign and Jubilee, while none was found on Lemieux and Simcoe. (W. Jones)

ROOT ROT or BLACK ROOT (cause unknown) was very prevalent in Wentworth, Wellington, and Waterloo counties, Ont.; in some plantations over 60% of the plants were killed (J.E. Howitt). A survey of 34 different strawberry areas in the Grand Lake - Washademoak district, N.B., on July 3-6 was made, and again on Oct. 16. The survey revealed that 18% of the plantations were clean, 6% were slightly affected, 41% moderately and 35% severely affected by black root. The plants bloomed freely and set a good crop of fruit, but the berries failed to grow and ripen according to nearly all growers visited. Fibrous roots were almost completely lacking where black root was present. The blackened roots were soft and the cortex pealed off under slight pressure. The centre of the root appeared to be the only living tissue. Black root was found on one and two year old plants. The yield was estimated to have been reduced 450,000 quarts and one grower reported his crop was cut from 5,000 and 150 boxes. (S.F. Clarkson)

GREY MOULD (Botrytis cinerea) caused a slight amount of blighting of the lower leaves in a planting at White Cane, N.B. It also caused a trace of damage to the fruit. Grey mould was reported causing damage to the fruit in 4 plantings in P.E.I.

WINTER INJURY. In plots mulched on November 1 at St. Catharines, before the freeze-up, 75% of the plants came through the winter with uninjured crowns. Where the plots were mulched on Dec. 15, only 15% of the plants escaped injury to the crown and roots. (G.H. Berkeley)

FROST INJURY. Frost caused moderate injury to the blossoms in several plantings in the Fraser Valley, B.C. Frost injury was rather severe about Charlottetown, P.E.I., causing an imperfect development of the fruit.

HAIL INJURY. Hail caused considerable injury on June 5 in Queens Co., and on July 12 in York Co., N.B.