IV. DISEASES OF FRUIT CROPS

A. POME FRUITS

APPLE

FRUIT ROT (Botrytis cinerea) affected the odd fruit of Lobo, McIntosh, Wealthy and Wolf River in late September at Ste. Anne de la Pocatiere, Que. (C. Perrault).

FIRE BLIGHT (Erwinia amylovora) was general in much of the interior of B.C., causing blossom, spur and twig infection; it was especially severe on crab apples (G.E. Woolliams). A few twigs were blighted on most trees in the Creston Valley; on Rob Roy and Jonathan larger limbs were sometimes attacked (M.F. Welsh). Blight was widespread at Edmonton, Alta., the situation being about as in 1947 (T.R. Davidson). Fire blight was light at Saskatoon, Sask., compared with 1946 and 1947. The dry weather of May and June probably reduced spread (T.C. Vanterpool).

For the first time in many years no infections were found in the Montreal district, Que. (R. Desmarteau, F. Godbout). In the Quebec City district blight was less general than last year, but was quite severe where it had not been regularly checked (O. Caron). At L'Islet Station blight was particularly severe in a small orchard, consisting largely of Yellow Transparent, but infection was also general in other untended orchards (R.O. Lachance). A single specimen was brought in at Charlottetown, P.E.I. (R.R. Hurst).

STORAGE ROT (Gloeosporium album) was found fruiting on five out of six rotting Linda apples at the Division of Horticulture, C.E.F., Ottawa, Ont., on 9 March 1948 (L.T. Richardson).

RUST (Gymnosporangium clavipes). A trace was found on McIntosh, Cortland and Delicious in the Laboratory orchard, St. Catharines, Ont. (G.C. Chamberlain).

ANTHRACNOSE (Neofabraea malicorticis) caused considerable damage in neglected orchards at Cowichan, B.C. (W. Jones).

PERENNIAL CANKER (Neofabraea perennans). Under some of the new spray schedules, the woolly aphis has been increasing recently in the Okanagan Valley, B.C. (See P.D.S. 27:83-84, 1948). This increase has been accompanied by increasing canker development. The fruit rot phase has also been troublesome in some orchards in certain years (H.R. McLarty). Some shipments, especially of Wagner, Delicious and McIntosh, from the 1947 crop in the Creston Valley suffered a rot due to N. perennans. A survey in May, 1948, of the orchards concerned showed most Wagner trees to be severely cankered, and occasionally cankers were found on the lower branches of Delicious and McIntosh. Most cankers appeared to be one or two years old. This re-appearance of perennial canker seems to be correlated with increase of woolly aphis (M.F. Welsh).

STORAGE ROT (Penicillium expansum) was more severe than usual in fruit stored at the Experimental Station, Fredericton, N.B., in November and December. Infection was usually centered around minute skin injuries (J.L. Howatt).

FROG-EYE SPOT (Phyllosticta limitata). A scattered infection of of McIntosh foliage occurred in an orchard at Meaford, Ont., damage was negligible (G.C. Chamberlain).

BLACK ROT (Physalospora obtusa) was seen on a few trees at Terrace, B.C. (W. Jones). Leaf spotting was quite common in orchards in N.B. during July and August and was heavy on unsprayed trees. Prolonged wet weather in May and part of June apparently favoured infection (S.F. Clarkson).

POWDERY MILDEW (Podosphaera leucotricha) was fairly general in the Saanich district, B.C. The usual spray schedule did not give good control. Damage was considerable in some orchards (W. Jones). It was general on the lower mainland (I.C. MacSwan). Mildew was severe in the southern parts, especially, of the Okanagan Valley, except for some orchards in the Kelowna area. A schedule of four sprays did not control fruit infection adequately in some experimental orchards. None of the newer fungicides have shown much promise (H.R. McLarty).

BROWN ROT (Sclerotinia fructicola). A small amount was found on cull Delicious and McIntosh apples held in common storage at St. Catharines, Ont. Infection followed insect injury or scab. It was also found on windfall fruits in the orchard (G.C. Chamberlain).

SCAB (Venturia inaequalis) was general on leaves and fruit throughout the lower mainland, B.C. (I.C. MacSwan). This was one of the worst scab years on record in the Okanagan Valley. Scab occurred as far south as Summerland and Penticton where it has not been seen for many years. The season was so cool and wet that losses were heavy in the Grand Forks area where sprays were inadequate or poorly timed. In the Vernon area four sprays were needed for adequate control. McIntosh was most seriously affected (G.E. Woolliams, H.R. McLarty). The situation in the Kootenays was equally serious, 1948 being one of the worst scab years in the history of the district. Where spraying was inadequate McIntosh was 100% affected and loss was heavy in other varieties. Foliage infection was also heavy, especially where no cluster-bud or pre-pink spray was applied (M.F. Welsh).

In the Guelph district, Ont., scab was less severe than in recent years. Hot, dry weather in mid-summer curbed spread and well-sprayed orchards were fairly free of the disease. (J.D. MacLachlan). Scab was moderately heavy on specimens received from a nursery at Windsor (D.B.O. Savile). Infection was serious in several orchards in the Niagara Peninsula. Unsprayed trees were seriously defoliated in July in the Laboratory orchard, St. Catharines. Infection ranged from 1.6 to 58% in sprayed plots. Scab was apparently less serious in other districts and only small amounts were seen in the Georgian Bay

area (G.C. Chamberlain). Relatively dry weather in spring and early summer and good conditions for spraying made scab easy to control in the Montreal district, Que., but some unsprayed trees were heavily infected (R. Desmarteau, F. Godbout). Scab was moderately heavy on leaves received from Hudson Heights (H.N. Racicot). Dry weather prevented serious development of scab at Quebec City, and it was soon checked where adequate spraying was practised. Ascospores were first seen on 12 May; they were abundant on 19 May and were found until mid-June (O. Caron).

Conditions in N.B. particularly favoured scab infection during the pre-bloom stages. The weather was extremely wet from 25 May to 14 June. Consequently scab was severe in unsprayed or poorly sprayed orchards. Ascospore discharge started on 26 May, and infections were first seen on 9 June on the undersides of leaves. Heavy infection combined with winter injury caused much defoliation in some orchards. Infection ranged from 0 to 100% (J.L. Howatt, S.F. Clarkson). Prolonged infection periods in May and June aided scab development in N.S. A three-day wet spell before the delayed dormant spray had been applied in most orchards coincided with the heaviest ascospore discharge of the season and resulted in considerable infection. Ascospores were discharged on 25 days in May and June. Primary infections were seen on 29 May. Spread of the disease continued at intervals throughout the season, and considerable late infection appeared in October on McIntosh, Wagner and other varieties. The intensity of ascospore discharge was less in 1948 than in some years, but this was offset by the frequency and duration of infection periods. Rainfall and spore discharge occurred for eight successive days just before bloom (J.F. Hockey). Scab was difficult to control and caused considerable loss in most orchards in P.E.I.; but little damage occurred in several that were very thoroughly sprayed (R.R. Hurst).

MOSAIC (virus). All the leaves of a Fameuse tree at Northampton, N.B., were mottled. This tree has been under observation for several years, during which it has borne no crop, but no spread seems to have occurred. The owner has now undertaken to remove the tree (S.F. Clarkson). The grafting programme in the Annapolis Valley, N.S., seems to have caused some spread of mosaic, which was seen on new scion wood in several orchards (J.F. Hockey).

BITTER PIT (non-parasitic) affected 15% of the fruit of 4 out of 7 Northern Spy trees in an orchard in Lincoln Co., Ont. Pitted fruits occur annually on these trees (G.C. Chamberlain). It was more common than usual this year at Guelph, especially on Spy (J.D. MacLachlan). Several specimens, all from isolated trees of Spy in N.B., were received (J.L. Howatt). Bitter pit was general and severe in N.S. on Stark, and was also seen on Gravenstein, Cox Orange, Northern Spy, Baldwin and other varieties. Losses ranged up to 65% (J.F. Hockey).

DROUGHT SPOT, etc. (boron deficiency). In the Okanagan Valley, B.C., growers are still experiencing some loss from die-back in trees on very light soil, even where the regular recommendations for boron applications have been followed. In such locations spray applications seem to be more effective than soil treatments (H.R. McLarty). No drought spot was seen in

the orchard in P.E.I., but it was recorded several times in imported fruit. Some die-back was seen, but it was not definitely known to be due to boron deficiency (R.R. Hurst).

MAGNESIUM DEFICIENCY caused leaf mottling in a young orchard at Lower Gagetown, N.B. The trouble was identified by Drs. O.L. Wyman and M.T. Hilborn, Dept. of Agriculture, Orono, Me. (S.F. Clarkson).

SOFT SCALD (physiological). A specimen of affected B.C. Jonathan was submitted from Montreal, Que., in Feb., 1948 (L.T. Richardson).

SPRAY INJURY occurred near Burlington, Ont., on unthrifty McIntosh sprayed with lime sulphur 1-60 plus lead arsenate (G.C. Chamberlain).

SUN SCALD. Specimens of McIntosh and other varieties were received from Cap St. Ignace, Montmagny Co., Que., in October (R.O. Lachance).

WINTER INJURY was exceptionally severe in 1947-48 in many parts of Ontario. The mild, open fall may have prevented the normal progress of dormancy, with consequent injury at the sudden advent of severe cold. Mild weather in late February, followed by sub-zero temperatures in early March may also have caused injury (J.D. MacLachlan). In many parts of N.B., McIntosh, in particular, suffered from winter injury as a result of five weeks of extremely cold weather in January and February. The damage varied from the killing of a few fruit and leaf buds to extensive killing of buds, twigs and small branches. Distortion of leaves and fruit accompanied by leaf and fruit drop was common in many orchards. Limb and trunk injury were reported on Linda and Sandow (J.L. Howatt, S.F. Clarkson). The winter in P.E.I., was favourable for apple trees and only one case of apparent winter injury was seen (R.R. Hurst).

PEAR

FIRE BLIGHT (Erwinia amylovora) was severe in only a few orchards in the Okanagan Valley, B.C. Growers have been given special warnings this fall to cut out infections, for it is felt that there has been a considerable build-up this season (H.R. McLarty). A severe outbreak in 1947, inadequate winter pruning, and a wet spring and summer in 1948 conspired to produce the worst fire blight situation for many years in the Kootenays. D'Anjou was less affected than other varieties (M.F. Welsh). In Lincoln Co., Ont., only scattered trees of Bartlett and one of Flemish Beauty were found with twig and branch infections (C.G. Chamberlain).

SCAB (Venturia pirina). In a commercial orchard of d'Anjou at Sidney, B.C., many overwintered pustules were found on the twigs in

April, despite an application of lime sulphur 1-16 in March. Later scab was very prevalent on foliage and fruit (W. Jones). Scab was severe on Flemish Beauty in the Salmon Arm and Oliver districts of the Okanagan Valley. The recommended spray schedule did not give adequate control at Salmon Arm (H.R. McLarty). In specimens of Flemish Beauty from B.C., placed in cold storage at Ottawa on 12 Oct., and submitted for examination on 27 Oct., extensive storage scab had developed (L.T. Richardson). The same conditions that produced an epidemic of apple scab in the Kootenays made this a season of very severe scab on Flemish Beauty (M.F. Welsh). In the Laboratory orchard at St. Catharines, Ont., Flemish Beauty trees were given a delayed dormant spray of 1% Krenite and foliage sprays of Phygon or Fermate according to the schedules used for apples. Both treatments were ineffective, 8% of the fruit being heavily scabbed (G.C. Chamberlain). Scab was very heavy on Flemish Beauty in imperfectly sprayed orchards in Queens Co., P.E.I. (R.R. Hurst).

STONY PIT (virus). Trees of d'Anjou in the Laboratory orchard, St. Catharines, Ont., grafted in 1946 with scions from suspected trees, bore nothing but pitted and worthless fruit (G.C. Chamberlain).

KILLING of TREES (cause unknown) occurred in various varieties in the Penticton, Naramata and Oliver districts, Okanagan Valley, B.C. Cultural conditions do not appear to be responsible and no parasitic organism has been found associated with the condition. The possibility of a virus is being examined (H.R. McLarty).

WINTER INJURY. Considerable injury occurred in pear orchards in parts of Ontario. See under Apple (J.D. MacLachlan).

QUINCE

LEAF BLIGHT (Fabraea maculata (Entomosporium m.). Specimens were received from Huntington, B.C. (H.N. Racicot, W. Toms, R.E. Fitzpatrick).

B. STONE FRUITS

APRICOT

CORYNEUM BLIGHT (Clasterosporium carpophilum) was very severe in those orchards in the Okanagan Valley, B.C., where it was present in 1947. Growers have applied a protective spray this fall, the first time that such a protective practice has been generally carried out (H.R. McLarty). This disease was unusually severe in unsprayed orchards in the Kootenays on fruit, leaves and twigs (M.F. Welsh).

FRUIT SPOT (Cylindrosporium sp.). Fruits with spots resembling those caused by Coryneum were received from two orchards in the Oliver district, Okanagan Valley, B.C. Examination showed masses of Cylindrosporium spores in each specimen. This is believed to be the first report of this

disease in B.C. (H.R. McLarty). The exact identity of this fungus is in doubt. It has been reported under the name C. Padi, but is apparently distinct, physiologically at least. All the isolates from Prunus spp. tested by Keitt (J. Agr. Res. 13:539-569, 1918) gave uniformly negative results on apricot.

BROWN ROT (Sclerotinia ?fructicola). Fruit rot and twig blight were common in the West Kootenay districts, B.C. (M.F. Welsh).

CHERRY

CORYNEUM BLIGHT (Clasterosporium carpophilum) was general and often caused serious defoliation in the lower mainland, B.C. In some orchards Shot hole was also present and made assessment of the blight injury difficult (I.C. MacSwan, R.E. Fitzpatrick). In the Kootenays, cherry trees adjacent to peach or apricot suffered severe leaf infection and some fruit infection (M.F. Welsh).

BLACK KNOT (Dibotryon morbosum) was abundant on wild cherry trees at Beaconsfield, Que. (H.N. Racicot). It was heavy near Quebec City, especially on trees in home gardens, which receive less attention than those in orchards (O. Caron). Infection was 40% on Prunus Mahaleb used for rootstocks at Kentville, N.S. (J.F. Hockey). Two severe cases were seen in gardens near Montague, P.E.I. (W.A. Hodgson, D.B. Robinson). Damage was very severe on wild and cultivated trees at Emerald Junction (R.R. Hurst).

SHOT HOLE (Higginsia hiemalis) was very prevalent and caused considerable defoliation in the lower Fraser Valley, B.C. (R.E. Fitzpatrick). Many orchards in the West Kootenay districts were almost defoliated by mid-summer (M.F. Welsh). Shot hole was generally of little importance in the Niagara district, Ont., until the onset of fall rains. On unsprayed trees at St. Catharines percentage infection of sweet cherry varieties was as follows: Schmidt's Bigarreau 9.2, Yellow Spanish 10.4, Elkhorn 19.0, Windsor 21.5, Napoleon Bigarreau 25.2, Gov. Wood 26.0, Bing 53.6, Black Tartarian 57.8. On unsprayed Montmorency sour cherries infection was 17.1% (G.C. Chamberlain). Shot hole caused complete loss of crop in trees at Highfield, P.E.I. (D.B. Robinson, W.A. Hodgson).

BROWN ROT (Sclerotinia fructicola). In the West Kootenay districts, B.C., some blossom blight occurred and there was severe fruit rotting in the orchard. Unsprayed crops were not fit for picking. In Creston Valley there was some decay of fruit during packing and transit (M.F. Welsh). On unsprayed trees in the Laboratory orchard, St. Catharines, Ont., the percentage of blighted blossoms on unsprayed sweet cherry trees was as follows: Black Tartarian 6.2, Elkhorn 11.0, Bing 13.2, Gov. Wood 18.9, Windsor 19.3, Napoleon Bigarreau 21.7, Yellow Spanish 39.6, Schmidt's Bigarreau 44.0. Rot of mature fruit was of no importance. Blossom blight and stem rot ranged from about 10 to 20% in orchards of Montmorency sour cherries in Lincoln Co. (G.C. Chamberlain).

WITCHES' BROOM (Taphrina Cerasi) was severe on a few trees in a home orchard at Brentwood, B.C. (W. Jones). It was seen at several places on the lower mainland (R.E. Fitzpatrick).

VERTICILLIUM WILT (Verticillium sp.). In a 2-year-old orchard in Lincoln Co., Ont., on soil devoted to tomato growing for 13 years, Hedelfingen was outstandingly susceptible in comparison with Lambert and Bing (G.C. Chamberlain).

GREEN RING YELLOWS (virus) was found in 6 orchards of Montmorency or Early Richmond sour cherries in the Niagara Peninsula, Ont., infection ranging from 0.5 to 2.8%. Infection of all trees examined was 0.31%, of which 0.125% was recurrent and 0.185% was new infection (R.S. Willison).

LITTLE CHERRY (virus). Further inspections have failed to reveal any little cherry in the Okanagan Valley, B.C., or at Edgewood, Needles and Grand Forks between the Okanagan and the Kootenays. Inspections were made by staffs of the Summerland Laboratory, Plant Protection Division, and the Horticulture and Plant Pathology Branches of the Provincial Department of Agriculture (W.R. Foster). Little cherry was seen in a few more of the remaining healthy orchards in the Kaslo and Creston districts in the Kootenays. In general, fruit from infected trees was slightly larger but with poorer flavour this year than previously, apparently because of the wet season (M.F. Welsh).

NECROTIC RING SPOT (virus). Orchards of Montmorency and Early Richmond sour cherries in the Niagara Peninsula, Ont., were again surveyed. In 5 orchards (892 trees) examined for the first time, shock symptoms ranged up to 0.9% (av. 0.2%) and etching, etc., often obscured by spray residue, averaged 1.0%. In orchards surveyed at least once previously, 36.5% of the trees were definitely infected, as judged by symptoms in one or more years, but the percentage of shock symptoms was so low in all but one of these that it is believed that infection is near the saturation point in the majority. Inoculation experiments this year indicated that shock symptoms on sour cherry nearly or quite indistinguishable from each other are the initial symptoms of tatter leaf, yellows and prune dwarf as well as necrotic ring spot. Thus these other diseases may in part pass as necrotic ring spot. The histories of some of the trees in the surveyed orchards suggest that other viruses have actually been involved to some extent in the production of shock symptoms (R.S. Willison).

RASP LEAF (virus). No further spread could be found at Erickson, B.C., and symptoms in the 6 affected trees were less pronounced than in 1947. Symptoms are very similar to those seen in the Okanagan Valley, but not identical (M.F. Welsh).

REVERSION (virus). A single tree of Late Duke at Creston, B.C., several years ago developed the habit of ripening its fruits unevenly, ripe ones and very small green ones being present simultaneously through the summer. The disease was identified by E.L. Reeves, U.S.D.A., Wenatchee, Wash. First report to the Survey (M.F. Welsh).

TATTER LEAF (virus). In 7 sweet cherry orchards in the Niagara Peninsula, Ont., surveyed for the first time, definite infection was 0.0-21.6 (av. 8.0)%, and suspected infection was 1.2-35.4 (av. 13.5)%. In 23 orchards previously surveyed definite infection averaged 15.9%, including 2.4% symptomless in 1948, and suspected infection averaged 16.1%, including 8.9% symptomless in 1948. Necrotic ring spot of sour cherries may cause slight tattering or necrotic spotting of some varieties of sweet cherries. These figures may, therefore, include some necrotic ring spot. In the varieties tested, tatter leaf has always shown definite symptoms annually. Trees infected with tatter leaf in 1948 tended to occur in groups near trees infected previously (R.S. Willison).

TWISTED LEAF (virus). One tree of Bing at Osoyoos, B.C., showed severe twisted leaf and other symptoms not usually seen in this disease. This orchard has been under observation for many years and is not close to any known infected trees (T.B. Lott).

YELLOWS (virus). In 5 orchards of Montmorency and Early Richmond sour cherries in the Niagara Peninsula, Ont., surveyed for the first time, 24.9% of trees were definitely infected and 3.8% suspected. In 22 orchards surveyed once or more previously infection was 41.2%, of which 9.9% was new. The range of total incidence was 5.1 to 90.9% and of new outbreaks was 0.0 to 39.6% in these orchards (R.S. Willison).

CRINKLE (bud sport) varied from 0 to 6% in 7 sweet cherry orchards examined for the first time in the Niagara Peninsula, Ont. In 23 orchards previously surveyed it ranged from 0 to 57% (R.S. Willison).

DIE BACK (boron deficiency). Symptoms are appearing in a number of orchards scattered through the Kootenays, B.C. Apparently cherry plantings have seldom been included in the regular boric acid applications (M.F. Welsh).

DISTORTING NECROSIS (cause unknown). The leaves of 3 trees in a block of 161 Seneca sweet cherries in Lincoln Co., Ont., were small, pale and distorted, with irregular necrotic areas. The trees appeared to be dying and adjacent trees were either dead or had been removed (R.S. Willison).

MOTTLED FOLIAGE (cause unknown). In 7 sweet cherry orchards in the Niagara Peninsula, Ont., surveyed for the first time, 19.6% of the trees showed various forms of mottling, 6.7% being associated with tatter leaf. In 23 orchards previously surveyed 30.4% of the trees showed mottling, 15.6% being associated with tatter leaf or crinkle. Some trees showed symptoms in 1947 but not in 1948; in general, however, the trouble increased (R.S. Willison).

Four trees in a block of 35 sweet cherries in Lincoln Co., Ont., showed pale green or yellow leaves with dark green rings, spots or lines. The trees were ¼ to 1/3 defoliated when inspected in June, and affected leaves were still dropping. A similar condition was seen in a tree of

Napoleon Bigarreau at the St. Catharines Laboratory in 1946; symptoms did not recur in 1947, and only a few leaves were affected in 1948 (R.S. Willison).

SMALL BITTER CHERRY (cause unknown). The extent of this trouble in the Okanagan Valley, B.C., principally on Bing, was much the same as in 1947 (T.B. Lott).

YELLOW FOLIAGE (cause unknown). In 28 out of 67 trees of Hedelfingen sweet cherry in an orchard in Lincoln Co., Ont., the leaves tend to become clear yellow and some of them fall prematurely. The symptoms are recurrent. The condition suggests some root or crown trouble, but none has been found. Aphids were not prevalent (R.S. Willison).

NECTARINE

BROWN ROT (Sclerotinia fructicola) was severe on fruit in a home orchard at Yale, B.C. (R. Hall, W. Jones).

PEACH

CORYNEUM BLIGHT (Clasterosporium carpophilum) was general for the first time in the Okanagan Valley, B.C., in peach orchards adjacent to infected apricots. Several growers applied fall sprays (H.R. McLarty). It was unusually severe throughout the Kootenays in unsprayed orchards, especially on the fruit (M.F. Welsh).

BLOSSOM BLIGHT and BROWN ROT (Sclerotinia fructicola). Loss from fruit rot was heavy throughout the Kootenays, B.C., on all varieties. In the Robson district blighting of Rochester extended from the twigs into the main limbs. Less severe twig and branch blight occurred elsewhere in the West Kootenays (M.F. Welsh).

Spray tests for the control of blossom blight were again carried out at the Laboratory, St. Catharines, Ont., with results as follows:

Variety	Treatment	Blossom Blight (%)
Elberta (Significant difference 1.4%)	Mulsoid sulphur, 1 spray	5.9
	" " , 2 sprays	0.7
	" " plus P.E.P.S., 1 spray	6.4
	" " plus P.E.P.S., 2 sprays	4.9
	Magnetic 70 paste, 1 spray	8.9
	" " " , 2 sprays	3.7
	Check	2.5
	Bartlett's sulphur, 1 spray 1/	12.2
	Phygon, 1 spray 1/	8.4
Rochester (Significant difference 2.24%)	Mulsoid sulphur, 1 spray	12.6
	" " 2 sprays	8.4
	" " plus P.E.P.S. 1 spray	11.2
	" " plus P.E.P.S. 2 sprays	8.2
	Magnetic 70 paste, 1 spray	12.8
	" " " , 2 sprays	9.9
	Check	15.3
Valiant	Check	3.54
	Mulsoid sulphur	5.36
	" " plus P.E.P.S.	4.17
	Check	4.69
	"Quick job" 2/	8.35
	Extra spray	4.64
	Check	5.20

1/ In Separate Block

2/ Slapdash, careless application simulating practice in some commercial orchards.

The weather during the bloom period was wet and cool with frequent drizzles (R.S. Willison). Spraying for blossom blight has often been disappointing, and has occasionally, according to Dr. Willison, tended to give increased infection; but the 1948 results for Elberta and Valiant are too remarkable to be ascribed to chance. The obvious moral from the Valiant tests is that a poor spray job may be worse than useless. The cause of the increased infection in several spray plots remains in doubt. It could conceivably be a mechanical washing of spores into the nectaries, lowered osmotic pressure of the nectar, or direct stimulus of the pathogen; but it seems likely that it is, at least in part, a destruction of the normal microflora of the blossoms analagous to that of wheat, shown by P.M. Simmonds (Sci. Agr. 27:625-632. 1947) to be antagonistic to Helminthosporium sativum (D.B.O.S.).

Control of brown rot in the harvested fruit in the Niagara Peninsula was quite satisfactory, in contrast to the blossom blight tests. In Elberta, total wastage up to the 7th day after harvest was 28.1% in the checks and varied from 10.7 to 20.9% in the various treatments; fruit moth injury added appreciably to the amount of infection. Rochester showed 63.0% wastage up to the 8th day in the checks and 14.7 to 32.2% in the sprayed plots. In Valiant, wastage up to the 6th day was 15.4 to 33.8% in the checks, being least in a central block that probably was partly protected by drifting spray from adjacent treated trees; wastage in sprayed blocks was 2.0 to 6.6%, the last figure being for the "quick job" described above in the blossom blight tests. Surveys of commercial orchards in the Niagara Peninsula showed that incidence of brown rot was closely correlated with fruit moth injury. Weather conditions were reasonably uniform and favourable through the harvest periods of the various varieties; consequently it was possible, for the first time in these investigations, to demonstrate varietal differences in susceptibility to brown rot. By calculating the percentage of moth-injured fruit attacked by brown rot in sprayed and unsprayed plots, varieties were found to range in decreasing order of susceptibility from Rochester (67.5%, 75.7%) through Fisher, Elberta, Vedette, Valiant and Oriole to Veteran (0.0%, 15.4%) (R.S. Willison). Brown rot destroyed 30% of the crop of Early May at the Station, Kentville, N.S.; the crop was light owing to winter injury (K.A. Harrison).

POWDERY MILDEW (Sphaerotheca pannosa) was less serious than usual in the Okanagan Valley, B.C., perhaps because of the unusually wet season; but it should be noted that the wet weather did not curb apple mildew in the southern sections (H.R. McLarty).

LEAF CURL (Taphrina deformans) was quite severe and general on the lower mainland, B.C. (R.E. Fitzpatrick, I.C. MacSwan). It was exceptionally serious in the Okanagan Valley, B.C., and some unsprayed orchards were defoliated. It may be noted that the pink stage, lime sulphur spray, for the control of twig borer, gave a measure of control in most orchards (H.R. McLarty). Leaf curl was severe in Creston Valley and very severe in West Kootenay where unsprayed trees were completely defoliated (M.F. Welsh). Specimens were received from Queenstown and Ingersoll, Ont. (J.D. MacLachlan). It was conspicuous in many orchards in the Niagara Peninsula, its occurrence always indicating inadequate spraying (G.C. Chamberlain).

WESTERN X DISEASES (virus). Some trees in the Okanagan Valley, B.C., showed striking symptoms, but on the average symptoms were less pronounced than usual. New infections in 9 mapped orchards were only 4 trees compared with the average of 21.7 per year since 1940 (T.B. Lott).

X DISEASE (virus). Single trees of Rochester and Swan were found infected in the border rows of an orchard in Lincoln Co., Ont. (G.C. Chamberlain).

PLUM

LEAF SPOT (?Cladosporium carpophilum). Specimens were received from Minden, Ont., with a report that the tree had been defoliated. Cladosporium sp. fruited fairly consistently on the spots and may have been the cause; but C. carpophilum is generally regarded as a fruit parasite on this host, although it is known to cause a leaf spot occasionally on peach (G.C. Chamberlain, D.B.O. Savile).

SCAB (Cladosporium carpophilum). Specimens were received from Cobden, Ont. (L.T. Richardson).

CORYNEUM BLIGHT (Clasterosporium carpophilum) was severe in the lower mainland, B.C. (R.E. Fitzpatrick, I.C. MacSwan).

BLACK KNOT (Dibotryon morbosum) was general in a neglected orchard of damson plums at North Saanich, B.C. (W. Jones). It was widespread and severe in the lower mainland (R.E. Fitzpatrick, I.C. MacSwan). Progress has been made in reducing the amount of black knot in plums in the Fraser Valley. The Indian Affairs Branch has considerably reduced the main source of infection on the reserves. Over one thousand illustrated circulars were distributed and an article was prepared for newspapers in the area. There are still many roadside trees that should be destroyed (W.R. Foster). An unusually large number of specimens was received from various parts of Ont. (J.D. MacLachlan). Scattered infections caused slight damage in a planting of Stanley prune in Lincoln Co.; the variety seems to be quite susceptible (G.C. Chamberlain). Specimens were received from Willowdale, near Toronto (L.T. Richardson). Specimens were brought in from a garden in Montreal, Que., in which it was said to be severe (J.E. Jacques). It was abundant near Quebec City, especially in home gardens (O. Caron). Between 30 and 40 knots were seen on a single tree at Kentville, N.S., necessitating removal of more than half the top (K.A. Harrison).

BROWN ROT (Sclerotinia fructicola) was heavy in a garden at Ottawa, Ont. (H.N. Racicot).

PLUM POCKET (Taphrina communis). Infection was 100% on a single tree in a small mixed orchard near Vancouver, B.C. (H.N.W. Toms). It was destructive on individual trees throughout Montreal, Que., and was seen at St. Hyacinthe (J.E. Jacques). Infection was almost 100% on a

tree in a garden at Granby, and specimens were received from Knowlton (H.N. Racicot). In the Quebec City region plum pocket is not receiving enough attention from growers and completely destroys the crops of neglected trees (O. Caron). Half the crop of several trees in Westmorland Co., N.B., was destroyed (J.L. Howatt).

BACTERIAL BLIGHT (Xanthomonas pruni) caused a scattered fruit spotting and leaf shot hole of Shiro in Lincoln Co., Ont. (G.C. Chamberlain).

PRUNE DWARF (virus). One affected tree of Italian prune was seen at Oliver, B.C. The only other occurrence of this disease in the Pacific Northwest known to the writer was that at Penticton reported in P.D.S. 20:82. 1941 (T.B. Lott).

STEM-END SHRIVELLING (?physiological). An unusual shrivelling that started at the stem end of prunes shortly before picking, at Grand Forks and quite generally in the Okanagan Valley, B.C., caused affected fruit to be graded as cull. The cause is unknown, but it is thought to have been a result of the cool, rainy season (G.E. Woolliams).

SAND CHERRY

BROWN ROT (Sclerotinia fructicola). Specimens were received from Eganville, Ont. (H.N. Racicot).

C. RIBES FRUITS

CURRANT

WHITE PINE BLISTER RUST (Cronartium ribicola). At Glenora, B.C., rust was general on Red Lake red currant. It was also general on all varieties of black currant except O-381 (W. Jones). O-381 (Crusader) and O-393 are the immune varieties produced from a cross between Ribes ussuriense and R. nigrum var. Kerry (P.D.S. 23:88-89. 1944). G.G. Hahn (Phytopath. 38:451-456. 1948) reports these two varieties as immune to blister rust inoculum from Conn., Me., Va., and Wis., but moderately susceptible to Sphaerotheca mors-uvae (I.L.C.). Blister rust was unusually severe at Winndel, Creston Valley, on all black currant varieties, most plantations being defoliated by mid-summer (M.F. Welsh). Rusted currant specimens were received from Larder Lake, Glencoe, St. Thomas, Norval and Thornhill, Ont. (J.D. MacLachlan). It was common and caused premature defoliation of black currants in the Niagara Peninsula, and specimens were received from Kemptville (G.C. Chamberlain). All red and black currants examined in the Grand Lake district, N.B., were heavily infected, but no rust was seen on the Ottawa hybrids at Fredericton (J.L. Howatt). Black currants were moderately infected at Kentville, N.S. (C.O. Gourley). A severe outbreak was seen at Montague and less serious ones at Summerside and Charlottetown, P.E.I. (D.B. Robinson, W.A. Hodgson).

ANTHRACNOSE (Drepanopeziza Ribis) was moderately heavy on red currants at Melfort, Sask. (H.W.M.).

POWDERY MILDEW (Sphaerotheca mors-uvae) was general in a one-acre planting of black currants at Victoria, B.C. (W. Jones). It was severe on red currants in gardens at Edmonton, Alta. (T.R. Davidson), and specimens were received from Trochu and Strome (A.W. Henry). Mildew was seen on black currants at several points in Ont. (J.D. MacLachlan). In variety tests of currants at Ste. Anne de la Pocatiere, Que., most of the plants were attacked in spite of spraying, but injury was mainly on the latest leaves produced (A. Payette). At Kentville, N.S., lime sulphur 1-50 gave good mildew control on red and black currants (C.O. Gourley).

GOOSEBERRY

ANTHRACNOSE (Drepanopeziza Ribis). Specimens were received from a nursery at Port Burwell, Ont. (G.C. Chamberlain). At Kentville, N.S., a slight infection was seen on 0-275 early in June. It increased steadily throughout the season on unsprayed plants (C.O. Gourley).

SEPTORIA LEAF SPOT (Mycosphaerella Grossulariae). A trace was seen late in the season at Kentville, N.S. (C.O. Gourley). A light infection, coupled with insect injury, caused slight damage at Charlottetown, P.E.I. (W.A. Hodgson, D.B.O. Savile).

CLUSTER CUP RUST (Puccinia Pringsheimiana). Traces occurred at the Botanical Garden, Montreal, Que. (J.E. Jacques). A light infection caused slight damage at Kentville, N.S. Organic fungicides did not appear to give appreciable control (C.O. Gourley).

POWDERY MILDEW (Sphaerotheca mors-uvae) was severe in some gardens at Edmonton, Alta. (T.R. Davidson). The entire crop of five bushes in a garden at Ste. Anne de la Pocatiere, Que., was lost, although no leaf infections could be seen (A. Payette). Specimens were received from St. Philippe de Neri, Kamouraska Co. (H.N. Racicot). It was observed at Kentville, N.S. (C.O. Gourley).

POTASSIUM DEFICIENCY caused considerable defoliation in the gooseberry planting at the Station, Kentville, N.S. Potash deficient plants showed increased susceptibility to Septoria leaf spot (C.O. Gourley).

D. RUBUS FRUITS

BLACKBERRY

CROWN GALL (Agrobacterium tumefaciens) was general and caused moderate injury in a 9-acre planting of Himalayaberry, Rubus procerus, at Keating, B.C. (W. Jones).

BOYSENBERRY

SEPTORIA LEAF SPOT (Mycosphaerella Rubi) was general and caused moderate damage in a commercial planting at Saanichton, B.C. (W. Jones).

LOGANBERRY

DRY BERRY (Haplosphaeria deformans) was moderately heavy in a few plantings at Keating, B.C. (W. Jones).

SEPTORIA LEAF SPOT (Mycosphaerella Rubi) caused considerable damage to leaves and fruit pedicels of loganberry at Keating and Salt Spring Island, B.C., and of Rubus macropetalus at North Saanich (W. Jones).

DOWNY MILDEW (Peronospora Rubi Rab.) was fairly general in low-lying wooded areas at Saanichton and Sidney, B.C., on Rubus macropetalus. See also under Raspberry (W. Jones).

RASPBERRY

CROWN GALL (Agrobacterium tumefaciens). Specimens were received from Creemore and Fort Erie, Ont. (J.D. MacLachlan). It was found on plants of Latham rogued for virus infection at Campbellford and Port Burwell, Ont., but damage was negligible (G.C. Chamberlain). A few plants of Washington were found to be infected at Kentville, N.S., during roguing; some canes were killed (K.A. Harrison). All 25 plants in a garden planting of Viking at Charlottetown, P.E.I., were infected and seriously injured (R.R. Hurst).

CANE BLIGHT (Botrytis cinerea). A moderate infection occurred on several varieties at the Agricultural College, Truro, N.S., and in a few home plantings in the vicinity (J.F. Hockey).

SPUR BLIGHT (Didymella applanata). Infection was light in commercial plantings at Edmonton, Alta. (T.R. Davidson). It was commonly found in plantings throughout central and southern Ont., especially on Latham although all commercial varieties appear susceptible. In one Taylor plantation in Lincoln Co. 56% of the canes bore lesions (G.C. Chamberlain). Two heavily lesioned lengths of cane were received from Pembroke. Infection was a trace in one acre of Viking and $\frac{1}{4}$ acre of Latham near Ottawa, and was moderately heavy on other specimens brought in from the district (H.N. Racicot). Spur blight was heavy and caused severe damage to Viking in Queens Co., P.E.I. (R.R. Hurst).

ANTHRACNOSE (Elsinoe veneta). Specimens were received from Teeswater and Woodstock, Ont. It was severe in a plantation of black raspberries at Guelph (J.D. MacLachlan). In a nursery at Port Burwell anthracnose was very extensive on black raspberries, especially Morrison, which was seriously injured; infection was also moderate on Sodus and Marion purple raspberries (G.C. Chamberlain). Infection was a trace in one acre of Viking and $\frac{1}{4}$ acre of Latham near Ottawa (H.N. Racicot). Anthracnose was severe in a planting

at Berthier, Que. The fungus fruited on the berries (R.O. Lachance). Anthracnose lesions appeared on half the new growth in a Viking plantation at Waterville, N.S. (K.A. Harrison). Viking was severely injured at Charlottetown, P.E.I. (R.R. Hurst).

ROOT KNOT (Heterodera marioni). A light infestation was found on a few plants at the University of British Columbia, Point Grey, B.C. (H.N.W. Toms). This appears to be the first report to the Survey of this nematode on Rubus.

CANE BLIGHT (Leptosphaeria Coniothyrium) destroyed 30% of the canes in a commercial planting at St. Norbert, Man. (W.A.F. Hagborg).

SEPTORIA LEAF SPOT (Mycosphaerella Rubi) caused a general leaf spotting and a die back of fruiting canes of cultivated black raspberry, Rubus occidentalis, at Duncan, B.C. It appeared that canes became infected during the first year but were not killed back until the following year. Leaf spot was common on wild R. occidentalis at Ladysmith (W. Jones).

DOWNY MILDEW (Peronospora Rubi Rab.) was prevalent in August on Rubus parviflorus (Anoplobatus) and R. spectabilis (Idaeobatus) in sheltered, low-lying areas at North Saanich, B.C. (W. Jones, W. Newton). See also under Loganberry. These appear to be the first records of P. Rubi in Canada. Since a species of the section Idaeobatus is included in the hosts recorded above, it is conceivable that cultivated raspberry might be attacked; but, as the fungus was confined to moist situations even in an unusually wet season, little fear need be entertained of its becoming a serious raspberry disease. The fungus is probably endemic on the west coast of Vancouver Island where higher rainfall occurs (D.B.O. Savile).

YELLOW RUST (Phragmidium Rubi-idaei) was common on wild Rubus occidentalis at Ladysmith, B.C. A general infection occurred in a plantation of Washington at Glenora. Leaves and petioles were infected and shrivelling of fruit spurs resulted, with substantial reduction of yield (W. Jones). The effect of yellow rust on Washington, until recently favoured for its resistance, appears to be serious and control measures are necessary (W.R. Foster). This is the fourth year since Washington was first reported rusted in B.C. See P.D.S. 25:97 and 27:95 (D.B.O.S.). Yellow rust was quite general in much of the B.C. interior; damage ranged from negligible on some varieties to quite extensive on others (G.E. Woolliams).

ROOT ROT (Phytophthora sp.). Oospores of Phytophthora sp. were abundant in the fibrous roots of raspberry plants submitted from Courtenay, B.C. The grower stated that many of the plants were dying. Root symptoms were somewhat similar to those of strawberry red stele (W. Jones).

LATE YELLOW RUST (Pucciniastrum americanum) caused some defoliation of Newburgh and Viking in a nursery at Arkona, Ont., but did not noticeably attack other varieties (G.C. Chamberlain).

POWDERY MILDEW (Sphaerotheca Humuli). Specimens were received from Watford, St. Thomas, Coldwater and Newmarket, Ont. (J.D. MacLachlan). Mildew was more or less general in all Latham plantings examined, especially in propagation beds. Severe infection caused stunting or spindly growth. Scattered infections were also seen on Madawaska, Ottawa and Viking (G.C. Chamberlain). Infection was a trace in one acre of Viking and $\frac{1}{4}$ acre of Latham near Ottawa (H.N. Racicot).

WILT (Verticillium albo-atrum) attacked and killed 5% of the canes in a Viking plantation in Welland Co., Ont., on land that had previously been used for tomatoes (G.C. Chamberlain). An infected specimen of Viking was received from Aylmer East, Que. (H.N. Racicot).

LEAF CURL (virus) and mosaic were more conspicuous than usual at Saskatoon, Sask. (T.C. Vanterpool). A trace, with severe stunting of affected plants, was seen in a plantation of Chief in southern Ont. (G.C. Chamberlain). A trace occurred in one acre of Viking near Ottawa (H.N. Racicot). Traces were found in two plantations in York Co., N.B. (D.J. MacLeod).

MOSAIC (virus) affected a few plants of Rubus occidentalis in a commercial planting at Duncan, B.C. The symptoms were well defined (W. Jones). Considerable mosaic was encountered in 7 nursery plantings of Latham, 2 of Cuthbert and Chief, and one of Trent and Viking in Ont. (G.C. Chamberlain). Traces were found in one acre of Viking and $\frac{1}{4}$ acre of Latham near Ottawa; specimens of an unnamed variety were also received from the Ottawa district (H.N. Racicot). Infection was 2% in a Latham plantation in Sunbury Co., N.B. (D.J. MacLeod). Five per cent of a new Viking planting at North Kingston, N.S., was infected (K.A. Harrison). Traces to 50% infection were found in various plantings examined in P.E.I. (R.R. Hurst).

YELLOW MOSAIC (virus) was seen in plantings of Ottawa and Taylor in Ont.; plants were markedly stunted (G.C. Chamberlain).

WINTER INJURY. Many specimens apparently affected by winter injury were received from various parts of Ont. (J.D. MacLachlan). Winter injury resulted in the death of 35% of the canes in a plantation of Taylor near St. Catharines. Spur blight was heavy in this plantation before the injury and unquestionably weakened the canes and later killed some that might have recovered; but winter injury was most severe in a few rows on one side of the planting, whereas spur blight infection was quite uniform (G.C. Chamberlain).

E. OTHER FRUITS

BLUEBERRY

A special survey was made by Mr. D.W. Creelman in mid-August, 1948, of the principal blueberry growing areas in the Maritime Provinces. The survey embraced areas in Kings and Queens Counties, P.E.I.; Westmorland, Northumberland, Restigouche, Gloucester, and Charlotte Counties, N.B.; and Kings, Digby, Cumberland, and Yarmouth Counties, N.S.

The following diseases were observed on wild low-bush blueberries:-

RED LEAF (Exobasidium Vaccinii) was by far the most widespread and serious disease encountered in 1948. It was recorded in all fields surveyed. Infected plants did not bear fruit and became defoliated soon after the fungus sporulated. Red leaf is the first disease to appear after burning. It was impossible to determine whether the disease seen in newly burned fields arose from systemic infection of the rhizomes of burned-off clones or from fresh infection by spores. The great variability in the development of separate infections in the same field suggested that both conditions might occur.

WITCHES' BROOM (Calyptospora Goeppertiana) was recorded in every county surveyed except Queens Co., P.E.I. Although only a limited number of shoots was affected in any one clone, the number of clones infected was very high in some fields. Again, no estimate was possible of the relative amounts of infection arising from systemic mycelium and from spores in the newly burned fields. The alternate host, Abies balsamea, grows in abundance in all the areas surveyed.

LEAF RUST (Thekopsora Vaccinionum) was not found even in fields close to the alternate host, Tsuga canadensis.

LEAF SPOTS (cause undetermined) were severe in Kings Co., P.E.I., Kings Co., N.S., and every county in N.B., especially Westmorland Co. Macroscopically there appear to be two distinct types, a red leaf spot and a brown leaf spot.

Defoliation was evident where leaf spot was severe. Growers state that yields and size of fruit are reduced where leaf spots were severe the previous year.

In newly burned fields new leaf spot infection is noticeable early in August. The intensity of infection increases annually as the time from the burn increases. In Yarmouth Co., N.S., where burning is practiced in some fields in alternate years, leaf spots are not serious.

POWDERY MILDEW (Microsphaera Alni var. Vaccinii) was found in Kings and Queens Counties, P.E.I., and in all counties of N.B. It was not found in N.S. during the survey, but it has been previously observed in the province. Powdery mildew was not severe in any fields but it is known that the disease may become severe and cause extensive defoliation later in the season.

MUMMY BERRY (Sclerotinia Oxycocci) was seen in all areas surveyed and was particularly noticeable in Northumberland and Restigouche Counties, N.B. In these counties the crop was somewhat later in ripening and fewer of the affected fruits had dropped. Mummied berries could easily be found on the ground in Kings Co., P.E.I. Severity of the disease could be better estimated in July.

TWIG and SHOOT BLIGHTS were recorded in all areas, the intensity varying from a blighting of individual tips to a killing of the entire shoot. Isolations from blighted twigs collected in Kings Co., N.S., yielded a Sclerotinia, probably S. Oxycocci, and Phomopsis Vaccinii. In some fields, notably one in Kings Co., P.E.I., plants over areas 4-5 feet in diameter were completely dead. The loss of crop is probably considerable.

STERILITY of entire clones was frequently observed.

PHYSIOLOGICAL DISORDERS. The cause was not determined. A wide range of symptoms, consisting chiefly of reddening of the foliage and dwarfing of the leaves, was noticed in some fields, particularly those on light soils. These symptoms are attributed to nutritional disorders, drought, or a combination of the two.

DIE BACK and CANKER (Godronia Cassandrae). Observations made on plantings of the high-bush blueberry in the Maritime Provinces this year have shown that all the diseases reported in the wild blueberry, with the exception of the leaf spots and red leaf, were present on the cultivated crop. In addition, die back and canker was again reported causing considerable injury. One planting near Kentville, N.S., composed largely of two-year old plants, suffered considerable loss of potential fruiting canes from Godronia this spring. The organism may be a virulent pathogen or a weak parasite of high-bush blueberry following winter injury. Evidence obtained to date is contradictory. If the damage observed this year were found to occur regularly this disease could well be a limiting factor in production.

STUNT (virus) was again recorded in two fields in Kings Co., N.S., and its appearance in an entirely different section of one planting suggests that some natural spread of the disease has occurred since last year.

BLOSSOM BLIGHTS (Sclerotinia Oxycocci and Botrytis cinerea) caused some damage in Kings Co., N.S.

The wild blueberry industry is one of considerable importance. The yield in N.B., is variously estimated at three to five million pounds and the yield for the three provinces is probably double that amount.

Although plant diseases and insect pests reduce crop yields considerably they are not considered the major problem in blueberry production. More serious are problems in cultural management especially the role of burning and the use of mineral fertilizers in maintaining a profitable stand of plants. The control of weeds, ranging from grasses to trees, is also a problem as these unwanted plants crowd out the bushes and make the economical harvesting of the crop more difficult or impossible.

Other Observations

RED LEAF (Exobasidium Vaccinnii) caused considerable loss at Ste. Anne de la Pocatiere and was also observed at Riviere Ouelle and St. Alphonse de Joliette, Que. (A. Payette).

CANKER (Godronia Cassandrae) is the most serious disease of the cultivated blueberry in B.C. It is particularly injurious in the younger plantations (R.E. Fitzpatrick).

CRANBERRY

LEAF BLIGHT (Naevia Oxycocci) caused heavy damage to wild Vaccinium macrocarpon at Ste. Anne de la Pocatiere, Que. Previously reported from N.B. (P.D.S. 21:71 and 22:82) (A. Payette, D.B.O. Savile).

RED GALL (Synchytrium Vaccinii). Infection was only a trace and damage was negligible in a bog at Port Mouton, N.S. This bog was heavily infected in 1938 and in previous years, but proper control of flooding has practically eliminated the disease. See P.D.S. 13:51, 16:55, 17:57, 18:80, 19:85 (D. Creelman).

FALSE BLOSSOM (virus). A trace was seen at Southampton, N.S. (D. Creelman).

GRAPE

WHITE ROT (Coniothyrium diplodiella (Speg.) Sacc.). Specimens were received from Meaford and Port Elgin, Ont. (J.D. MacLachlan). Not previously noted in the Survey, but reported from Winona and St. Catharines, Ont., by J.E. Howitt (Sci. Agr. 3:189. 1923), who stated that Agawam was quite susceptible. First reported in the United States in 1887. Apparently a minor parasite, readily controlled by the black rot schedule. Known also from Italy, France, Switzerland and England (D.B.O.S.).

DEAD ARM (Fusicoccum viticola). Infection was 10-12% in one Concord vineyard of 1100 vines in Lincoln Co., Ont. It is common in the Niagara Peninsula especially on Concord (G.C. Chamberlain).

BLACK ROT (Guignardia Bidwellii). A 5% infection was found scatteringly in a 5 acre vineyard of Concord at Smithville, Lincoln Co., Ont. (G.C. Chamberlain).

DOWNY MILDEW (Plasmopara viticola). Specimens were received from Meaford, Ont. (J.D. MacLachlan). In an unsprayed vineyard of Fredonia in Lincoln Co., Ont., 70-80% of the vines bore mildew infection; the damage was considerable because of loss of fruit clusters. Adjacent Agawam and Delaware, considered to be highly susceptible, showed only a trace of foliage infection (G.C. Chamberlain). Specimens showing considerable fruit infection were received from Hants Co., N.S. (J.F. Hockey).

POWDERY MILDEW (Uncinula necator) was prevalent on European grape varieties at the Experimental Station, Summerland, B.C., causing severe damage to both fruit and foliage (G.E. Woolliams). A specimen was received from Montreal, Que. (H.N. Racicot).

CHLOROSIS (cause unknown) affected 52% of the vines in one area of a Concord vineyard in Lincoln Co., Ont. It has occurred annually in this vineyard for 10 years (G.C. Chamberlain).

HERBICIDE INJURY. Stunting and distortion of the foliage of Concord in Welland Co., Ont., occurred in July as a result of roadside spraying with 2,4-D. The vines recovered later in the season (G.C. Chamberlain).

STRAWBERRY

LEAF BLIGHT (Dendrophoma obscurans (Ell. & Ev.) Anderson) caused about as much injury to strawberry foliage at Ottawa, Ont., as leaf spot or scorch. The lesions were medium to dark brown, mostly at the edges or tips of the leaflets and triangular; those in the blade were round or irregular. The fungus fruited only when infected leaves were placed in moist chambers. (See H.W. Anderson. Ill. Agr. Exp. Sta. Bull. 229. 1920). The disease was also found at St. Catharines and Park Hill (Joan E. Fall, H.N. Racicot).

LEAF SCORCH (Diplocarpon Earliana) affected all the plants in a small part of a field of Senator Dunlap in Carleton Co., Ont. (L.T. Richardson). It was moderately abundant on all varieties at Ottawa (H.N. Racicot).

ROOT KNOT (Heterodera marioni). A light infection occurred in the plots of the University of British Columbia, Point Grey, B.C. Nematodes, not positively identified, were also found in abundant root knots on Taraxacum officinale and Sonchus oleraceus growing as weeds in the same plots. Similar knots were found on roots of strawberry in a field at Sumas, but no nematodes could be found although H. marioni was present in knots on Cirsium arvense from the same field. Determinations were made by Dr. A.D. Baker (H.N.W. Toms, R.E. Fitzpatrick). This is the first report to the Survey of H. marioni on strawberry, but it is known to attack this host in the United States.

LEAF SPOT (Mycosphaerella Fragariae) occurred generally throughout the lower mainland, B.C., but caused little damage to British Sovereign, the main commercial variety (R.E. Fitzpatrick). It was general in the lower Fraser Valley (I.C. MacSwan). Leaf spot was found in two plantings of Valentine in the Niagara Peninsula, Ont.; the variety appears to be susceptible, but the damage was negligible (G.C. Chamberlain). It was observed at St. Catharines and Park Hill and was abundant on most varieties at Ottawa. Premier seems to be quite resistant (H.N. Racicot). Leaf spot was severe on Louise throughout N.S., and was moderate on Senator Dunlap in Yarmouth and Kings Co. It was more prevalent than for several years (J.F. Hockey). A moderate infection was recorded at De Sable, P.E.I. (D.B. Robinson).

RED STELE (Phytophthora Fragariae) was severe in southern Vancouver Island, B.C. (W.R. Foster). A slight infection was seen in a planting of British Sovereign at Keating (W. Jones). Scattered outbreaks were found in Colchester, Kings, Lunenburg and Yarmouth Co., N.S. Oogonia 26-33 x 30-44 microns were present in the distal and median parts of roots from many sources during May and June, but were not seen after the first week of July. The presence of red stele was first suscepted in 1945, but no general outbreak occurred before 1948. The presence of the organism in widely scattered parts of the province, and on farms where no new plants had been introduced for several years, suggests that it may be indigenous or at least long established. The exceptionally wet soil conditions in May and June clearly favoured the fungus (J.F. Hockey).

POWDERY MILDEW (Sphaerotheca Humuli). Light infections were general throughout the lower Fraser Valley, B.C. It occurred generally on British Sovereign, in which it was the commonest cause of leaf spotting, but damage was usually negligible (R.E. Fitzpatrick, I.C. MacSwan). Specimens were received from Watford and Scarborough, Ont. (J.D. MacLachlan). Mildew appeared on 5 of 12 potted plants of Royal Sovereign in the laboratory greenhouse, St. Catharines, in December; adjacent Climax and Fragaria vesca were unaffected (G.C. Chamberlain). One specimen was brought in at Ottawa (L.T. Richardson).

CRINKLE (virus). What appeared to be this disease was seen in a 3-year-old garden planting at Saskatoon, Sask. (T.C. Vanterpool).

MILD MOSAIC (virus). Traces were found in two fields of Senator Dunlap in Queens Co., N.B. (D.J. MacLeod).

WITCHES' BROOM (virus). Infection was 7% and 10% in two plantations of Senator Dunlap in York and Queens Co., N.B. (D.J. MacLeod). A few infected plants, especially of Premier, were found in scattered plantings at Berwick, N.S. (J.F. Hockey).

YELLOWS (virus) was severe in Marshall in the lower mainland, B.C. All the Marshall plantations visited seem to be affected to some degrees by yellows and crinkle (R.E. Fitzpatrick). At the Horticultural Substation at MacDonald's Corners, Queens Co., N.B., yellows was severe in Catskill. Affected plants were stunted and showed crinkling, upward curling, and marginal and interveinal yellowing of the leaves. The yellowing was suppressed during hot weather, but was conspicuous early and late in the season. Stolon production was suppressed in some plants (D.J. MacLeod).

JUNE YELLOWS (genetic breakdown) was frequently seen affecting 5-10% of the plants in new fields of Premier in Lincoln Co., Ont., in April and May (G.C. Chamberlain). Eighty-seven per cent of the plants in a field of Premier in Queens Co., N.B., were affected (D.J. MacLeod). It was quite prevalent in Premier at Berwick, N.S., commonly affecting 25-100% of the plants, but it was not seen in the Lowden strain (J.F. Hockey).

ROOT ROT (cause unknown) was unusually prevalent in the lower mainland, B.C. (R.E. Fitzpatrick). A crown rot was prevalent in the lower Fraser Valley in all soil types, in high and low situations and in old and new fields (I.C. MacSwan). It is not clear whether this is a distinct trouble from root rot, but its severity in a wet season suggests that it may be the same (D.B.O.S.). Specimens were received from Prince Albert and Saskatoon, Sask. Prolonged flooding from an exceptionally heavy snow cover may have been largely responsible (T.C. Vanterpool). Severely stunted plants with blackened roots were received from Indian Head, Sask. (R.G. Atkinson). Plants growing adjacent to raspberries affected by cane blight at St. Norbert, Man., were attacked by a severe root rot, hundreds of plants being in various stages of destruction. H. Wormald (Diseases of Fruits and Hops. 1939. p. 219) states that Leptosphaeria Coniothyrium has been found in association with a root rot of strawberries. No isolations were made from this material (W.A.F. Hagborg). In view of the accumulating evidence that L. Coniothyrium is often a secondary invader of weakened or diseased canes, its presence in rotting strawberry roots is far from conclusive evidence that it is a cause of their decay. It is possible that conditions conducive to strawberry root rot may also encourage cane blight of raspberry (D.B.O.S.). Specimens were received from Fort William, North Bay, St. Mary's, Tillsonburg, Bright, New Hamburg, Kitchener, Port Nelson, Oakville, Cooksville, Meadowville, Scraborough Bluffs and Oshawa, Ont. (J.D. MacLachlan). Infection ranged from 0-50% in the strawberry plantings in the Grand Lake area, N.B. (J.L. Howatt).