IV. DISEASES OF FRUIT CROPS

A. POME FRUITS

APPLE

STORAGE ROT (Alternaria ?mali) affected several apples in a retail market at Charlottetown, P. E. I. (R. R. Hurst).

FIRE BLIGHT (Erwinia amylovora). Damage was severe in the provincial orchard at Brooks, Alta. All trees of several susceptible varieties were removed. Slight to moderate infection occurred on apples at New Dayton and Lethbridge (M. W. Cormack). A tree of Bechtel's Crab, Malus iowensis var. plena, at Ottawa, Ont., showed 8 infected blossom spurs. This species is seldom affected (H. N. Racicot).

RUST (Gymnosporangium spp.). G. juniperi-virginianae was reported to be moderately heavy on Delicious and Wealthy in the Trenton district, Ont. Fruits were deformed at the calyx end (G. C. Chamberlain). Infected leaves were found on scab-resistant seedlings (row 7, trees 96, 108, 109) in the Dept. of Agriculture orchard at Smithfield (H. N. Racicot, I. L. Conners). G. clavipes affected less than 5% of fruit in any orchard seen in N. S.; infection was usually only a trace in spite of heavy development of telia on juniper. Prolonged rains at telial expansion may have been unfavourable to infection (J. F. Hockey).

TWIG BLIGHT (Nectria cinnabarina) damaged a few branches on a tree of Red Rome Beauty at Woodville, Kings Co., N. S. (R. G. Ross).

EUROPEAN CANKER (Nectria galligena) caused moderate damage to Gravenstein, Red Delicious and Wagner in a 15-year old orchard at Cambridge, Kings Co., N. S. The orchard had been neglected for 5 years (J. F. Hockey).

ANTHRACNOSE (Neofabraea malicorticis) was severe in an orchard of Wagner at Sidney, B. C. (W. Jones).

PERENNIAL CANKER (Neofabraea perennans). An usually heavy infestation of woolly aphis in Creston Valley, B. C., has increased the danger that perennial canker and bull's-eye rot, already increasing, will again become major problems (J. M. Wilks).

BLACK ROT (Physalospora obtusa) slightly infected wild apples at Centreville, Carleton Co., N. B. (S. R. Colpitts). Gravenstein and Northern Spy showed 2% infection at Kentville, N. S., in October (J. F. Hockey). Traces were seen in Northern Spy on sale at Charlottetown, P. E. I. in February (R. R. Hurst).

POWDERY MILDEW (Podosphaera leucotricha) was common in the North Saanich district, B. C., and occasionally caused die-back of twigs (W. Jones). In the Okanagan Valley, mildew caused slight damage to fruit of Jonathon and McIntosh and severely damaged terminal growth of the former (D. L. McIntosh).

SILVER LEAF (Stereum purpureum) affected a few trees at the Station, Kentville, N.S., and killed one (C.O. Gourley, R.G. Ross).

SCAB (Venturia inaequalis) was moderately heavy on the fruit of three trees of Yellow Transparent at Britannia Beach, B.C. (I.C. MacSwan). Scab was severe on foliage and fruit of all varieties of the Kootenay, Salmon Arm and part of Penticton districts (D.L. McIntosh). Scab was generally well controlled in the Niagara Peninsula, Ont. In the Laboratory orchard, St. Catharines, infection was 59% on fruit of unsprayed McIntosh; infection in the variously sprayed trees ranged from 0.3 to 18.0% (G.C. Chamberlain). It was severe on fruit of a crab from Kenogami, Chicoutimi, Co., Que. (H.N. Racicot). To judge from requests for information, it was common and severe in home orchards at Montreal, Longueuil and Sorel (J.E. Jacques). Scab was difficult to control in the lower St. Lawrence because sprays generally could not be applied at the best time. Even the best growers produced low-grade fruit (R.O. Lachance).

In N.B. the early part of the season greatly favoured scab development and infection was moderate to severe in poorly sprayed orchards. Most of the scab seen was from ascospore infection. The latter half of the season did not favour spread (J.L. Howatt). The overwintered leaves contained more perithecia than usual. A light ascospore discharge occurred at Fredericton on 7 May and heavy discharges on 12, 21 and 22 May. Rainfall was heavy from 7 May to 21 June. Leaf infection was seen on 5 June. Primary scab was controlled in well-sprayed orchards, but in others infection was heavy. The wet weather usually made timely spraying difficult (S.F. Clarkson).

In N.S. ascospores were mature before the buds of most of the apple varieties showed green. Very severe infection periods were experienced during the pink, full bloom and petal fall periods. Primary infections appeared during full bloom, increasing the inoculum. The season was difficult for spraying and favoured fungus development. Orchards which received little or no spray were defoliated in July. Many commercial growers used eradicant fungicides to supplement their regular sprays, with excellent results (J.F. Hockey). Infection was 5% at Charlottetown, P.E.I. (J.E. Campbell). Infection varied from sl. to sev. in various districts (R.R. Hurst). Scab caused defoliation of unsprayed McIntosh in the Waterford Valley area, Nfld. A moderate infection was noted on Yellow Transparent at Topsail (G.C. Morgan).

BITTER PIT (physiological) affected 5% of a lot of Northern Spy in Lincoln Co., Ont., in December; the fruit were sound when picked. Severely pitted specimens of a shipment of Wine Sap from B.C. were received from Toronto on 28 April 1952, without information on the percentage affected. Specimens of Talman Sweet were received from Montreal, Que., 21 Nov. (G.C. Chamberlain).

DROUGHT SPOT (boron deficiency) severely affected all fruit of Northern Spy at a location in Queens Co., P.E.I. (R.R. Hurst).

FREEZING INJURY destroyed 2% of the fruit in a hamper of Delicious in Queens Co., P. E. I., in January (R. R. Hurst).

CHLOROSIS (lime-induced iron deficiency) was seen on apples and all other tree fruits in many districts of the Okanagan Valley, B. C., particularly where poor drainage causes wet soil. Experiments indicate that some of this trouble may be due to combined deficiencies of iron, manganese and zinc (C. G. Woodbridge).

CHLOROSIS (manganese deficiency) has been found in many parts of the Okanagan Valley, B. C., in apple and other fruits and in vegetables. It is usually found in slightly alkaline soils, pH 7. 2-7. 9 (C. G. Woodbridge).

LEAF BLOTCH (magnesium deficiency) was unusually serious this year in the Okanagan Valley, B. C., perhaps because of the hot, dry summer. Experimental spraying with Epsom salt gave good control, but soil applications were ineffective (C. G. Woodbridge). Early defoliation and fruit drop occurred on McIntosh with a heavy crop at Cambridge, Kings Co., N. S., but trees in the same orchard with a light crop appeared quite normal (J. F. Hockey).

LITTLE LEAF and ROSETTE (zinc deficiency) were much more prevalent than usual in the Okanagan Valley, B. C., on all tree fruits (C. G. Woodbridge). It appeared, at least in mild form, on some trees of most orchards in Creston Valley. Orchards sprayed in June with zinc oxide responded quickly (M. F. Welsh).

SOOTY MOULD (? on aphis honey dew) was seen on McIntosh at Gagetown, Queens Co., N. B., on 6 Aug. (S. R. Colpitts).

PEAR

FIRE BLIGHT (Erwinia amylovora). Very little damage occurred in Bartlett and Flemish Beauty plantings this year in the Okanagan Valley, B. C. (D. L. McIntosh). It is still moderately serious in a few orchards in Creston Valley, but continued winter cutting and inspection have reduced the intensity in most parts of the valley to the level of the years preceding the 1948-1951 epidemic. Blossom-spraying shows promise in some of the orchards still infected (M. F. Welsh). Limb and trunk cankers occurred on a number of trees in an orchard of 8-year-old Bartlett in Lincoln Co., Ont. Killing of twigs, spurs and branches was common in a 6-year-old block of Bartlett, where many trees have been seriously injured by trunk cankers in the last three years (G. C. Chamberlain).

FRUIT ROT (Gloeosporium sp.). A few fruits of Clapp's Favorite from a home garden at Kentville, N. S., were rotted on 10 Sept. (D. W. Creelman).

FRUIT ROT (Phytophthora cactorum) attacked a few fruit on the trees in late August, in an orchard at Wolfville, N. S., that had received the full spray schedule for scab and showed little of that disease (D. W. Creelman).

SCAB (Venturia pirina) was common on unsprayed trees in home gardens at Sidney, B. C. (W. Orchard). It was serious on Bartlett, in which it is usually unimportant, in the Fonthill and Fenwick district, Welland Co., Ont. In one orchard 40 bu. were graded unmarketable out of 160 due to large blemishes. In a second the loss was stated to be 5 out of 14 tons (G. C. Chamberlain). Specimens sent by Mr. Chamberlain bore superficial but very large lesions with a pattern of reticulate scales. The appearance suggested that infection had taken place when the fruit was small, but that the lesions had remained too shallow to cause the fruit to be seriously malformed (D. B. O. S.). At Wolfville, N. S., foliage infection was 25% on unsprayed Bartlett and Sheldon. Fruit scab was heavy on unsprayed trees at Kentville, causing considerable distortion and cracking (D. W. Creelman). Scab was heavy on Flemish Beauty in Queens Co., P. E. I. (R. R. Hurst).

SUMMER WILT (cause unknown) was seen in several parts of the Okanagan Valley, B. C. It occurs from August to October, before or after picking of the crop. Affected trees wilt completely a few days after the first symptoms are visible. Removing the crop and spraying the foliage continuously with water slow down the wilting. Trees often die in the same year, but may put out weak suckers in the next year (C. G. Woodbridge).

THIN WOOD (cause unknown). Seen on Bartlett at Summerland and Penticton, B. C. (C. G. Woodbridge). See P. D. S. 31:89.

QUINCE

RUST (Gymnosporangium clavipes) infected 10-60% of the fruit on different trees at the Station, Kentville, N. S. Much of the fruit was useless (D. W. Creelman).

B. STONE FRUITS

APRICOT

CORYNEUM BLIGHT (Clasterosporium carpophilum) was severe on unsprayed fruit throughout the Okanagan Valley, B. C. (D. L. McIntosh). Infection was moderate in Creston and West Kootenay Valleys. In unsprayed orchards fruit spotting was severe and twig cankering moderately severe. The shuck-fall spray, developed for peaches, is even more effective for fruit protection in apricot; but the September spray gives only partial control of bud infections and limb and twig cankers in apricot (M. F. Welsh).

BROWN ROT (Monilinia (Sclerotinia) fructicola). Fruit infection was heavy at Summerland, B. C., on seedlings closely planted in propagation rows under sprinkler irrigation (D. L. McIntosh). Blossom blight was 75% on a single apricot in a peach orchard at Wolfville, N. S. (D. W. Creelman).

WILT (Verticillium albo-atrum) was found at Osoyoos, B. C., on young Moorpark trees in orchards where wilt had been present in crops such as tomato and cantaloupe (G. E. Woolliams).

LITTLE LEAF and ROSETTE (zinc deficiency). Symptoms were unusually prevalent in the Okanagan Valley, B. C., on tree fruits and were noticed for the first time on apricot (C. G. Woodbridge).

SWOLLEN NODES (boron toxicity). Greatly enlarged nodes are a symptom of boron toxicity in the Okanagan Valley, B. C., often associated with die-back or stunting of the tips of branches. Caused by over-zealous use of boron compounds to correct deficiency (C. G. Woodbridge).

CHERRY

BLACK KNOT (Dibotryon morbosum) was heavy on wild pin cherry at Centreville, Carleton Co., N. B. (S. R. Colpitts). It caused severe damage to sour cherries in Queens Co., P. E. I. (R. R. Hurst). A moderate infection occurred on sour cherries at Topsail, Nfld. It was heavy on wild pin cherry near Grand Falls, in Bonavista Bay and on the Avalon Peninsula (G. C. Morgan).

SHOT HOLE (Higginsia hiemalis) was severe late in the season on all varieties of sweet cherry in the West Kootenay district, B. C. Early infection of leaves and fruit pedicels was scarce (J. M. Wilks, M. F. Welsh). It was not important on sour cherry this year in the Niagara Peninsula, Ont. Unsprayed trees showed 10-18% leaf infection and slight defoliation at the end of the season (G. C. Chamberlain).

BLOSSOM BLIGHT and BROWN ROT (Monilinia (Sclerotinia) fructicola and M. laxa). Blossom blight was light on Bing and Lambert sweet cherry at Boswell, B. C. (D. L. McIntosh), but was moderately heavy on all varieties in the West Kootenay districts. A dry spell while the fruit was ripening caused fruit rotting to be very light (J. M. Wilks, M. F. Welsh). Blossom blight (M. fructicola) was only a trace in sweet cherry orchards in the Niagara Peninsula, Ont.; but 6-7% of blossoms were destroyed in an orchard of Montmorency sour cherry, and a little rot of green fruit occurred in the same orchard (G. C. Chamberlain). M. fructicola, spreading from blossom infection, caused a loss of 10% of the crop of sweet cherry at Kentville, N. S. Hot, dry weather in July checked its spread in sweet and sour cherries (D. W. Creelman, C. O. Gourley).

CROWN ROT (Phytophthora cactorum). Surveys of 49 orchards of Bing, Lambert and Van sweet cherry throughout the Okanagan Valley, B. C., revealed 33 infected trees out of 4615 examined (D. L. McIntosh).

POWDERY MILDEW (Podosphaera oxyacanthae) caused heavy loss of fruit of Lambert sweet cherry on the upper benches at Penticton, B. C. It occurred mainly on the terminal leaves of young trees of Van at the Station,

Summerland (G. E. Woolliams). Mildew caused slight foliage damage to Montmorency sour cherry at Erickson, in Creston Valley (J. M. Wilks). It was present on all trees of a young, closely planted block of Montmorency in the Laboratory orchard, St. Catharines, Ont., but caused slight damage (G. C. Chamberlain).

WITCHES' BROOM (Taphrina cerasi) was seen on Mayne I, near Vancouver I., B. C. It seems to be increasing in the district (W. Jones). Witches' broom was seen on a sweet cherry at Langley, B. C., and two specimens were brought in from the Vancouver area. Agricultural workers reported it to be general on sweet cherry in the Fraser Valley (I. C. MacSwan). It was seen at Kilgard and in the Aberdeen-Otter area, lower Fraser Valley. The broom of reddened leaves was conspicuous against the blossom on 28 April (H. N. W. Toms).

WILT (Verticillium albo-atrum). The pathogen was isolated from several diseased trees of Van in the stone fruit orchard at the Station, Summerland, B. C. (G. E. Woolliams). Specimens from two 3-year-old trees of Montmorency, sent in from Aldershot, Ont., showed the vascular discoloration typical of Verticillium (G. C. Chamberlain).

Dr. R. S. Willison has provided the following report, "Virus Disease Survey in the Niagara Peninsula, Ont."

The sixth annual survey for incidence of virus and virus-like symptoms in sweet and sour cherry orchards was conducted in 1952. The data for sweet cherries are summarized in Table 9 and for sour cherries in Table 10. Trees removed for various reasons during the six year survey period are not included in the current summaries. The tables present the percentage occurrence of symptoms, both old and new cases, and the percentage of previously infected trees not showing symptoms in 1952.

In both sweet and sour cherries, the frequency of recurrence of a given symptom type varies from orchard and from season to season. Moreover, the seasonal conditions which favour expression of one symptom type may not favour that of another type; e. g., in sour cherries etching (the chronic phase of necrotic ring spot) recurred in 50. 2 and 16. 5% of known cases in 1951 and 1952 respectively, whereas the corresponding figures for recurrence of yellows were 52. 0 and 79. 7%.

Since shock symptoms in sour cherries occur only in the early stages of infection with a number of different virus types, the appearance of shock after chronic symptoms have been observed on a tree for more than one year indicate a second infection presumably with a virus more or less different from the one already present. Several such cases of multiple infection have been recorded during the six-year survey period, under the following circumstances:

(a) on trees known to have been infected for more than one year;

(i) shock after chronic symptoms of necrotic ring spot - 10
(ii) " " " " " yellows - 14
(iii) " " previous shock (several years intervening) - 13

(b) on trees not known to have been infected for more than one year;

Chronic symptoms of necrotic ring spot observed only in the year preceding the appearance of shock symptoms - 66

Table 9. Summary of occurrence of symptoms in 13 sweet cherry orchards in 1952

Symptoms recorded	Cases				Percentage Trees Examined
	New	Recurring	Non-Recurring	Total	
Mottles, rings, etc.	101	246	781	1128	56.40
Necrotic spotting	199	9	70	278	13.90
Tatter leaf (suspect)	17	7	174	198	9.90
Tatter leaf	13	98	117	228	11.40
Crinkle and pseudocrinkle	65	80	250	395	19.75
Small leaf (rosette ?)	16	11	12	39	1.95
Rasp leaf	1	1	4	6	.30
Mild rugose mosaic	7	2	1	10	.50
Lambert spot	1 (a)	1	0	1	.05
Yellow mosaic patterns	3	0	0	3	.15
Yellow leaves (?)	3	0	0	3	.15
Total cases	425	455	1409	2289	114.45
Combined cases	---	150	735	885	44.25
Trees affected				1404	70.20
No symptoms				596	29.80
Total trees				2000	100.

(a) Tree removed

In the last instance, the observed shock may or may not have been evidence of a second infection. It is also known that, if infection occurs early in the growing season, a tree can become systemically infected without going through the shock phase. Thus the actual frequency of multiple infection probably greatly exceeds the frequency demonstrable by survey only.

Table 10. Summary of occurrence of symptoms in 10 sour cherry orchards in 1952.

Symptoms recorded	Cases				Percentage Trees examined
	New	Recurring	Non Recurring	Total	
Yellows (suspect)	63	16	205	284	9.2
Yellows	403	672	171	1246	40.4
Etching	36	62	314	412	13.3
Shock symptoms	29	5	213	247	8.0
Green ring mottle	7	8	1	16	0.5
Mottle & ring patterns	57	4	44	105	3.4
Tatter leaf (suspect)	2	0	13	15	0.5
Narrow leaf	10	2	7	19	0.6
Rasp leaf	3	2	12	17	0.6
Abnormal fruit	2	0	0	2	0.1
Total cases	612	771	980	2363	76.6
Combined cases	--	84	534	618	
Trees affected				1745	56.6
No symptoms				1339	43.4
Total trees				3084	100.

ABNORMAL FRUIT (virus). Two trees in one of the survey orchards of Montmorency sour cherry in Louth Twp., Lincoln Co., Ont., bore mildly rosetted, leathery, rolled leaves, and malformed fruit with internal browning. Parts of each tree also had symptoms of yellows. A similar case was reported in 1950 from Clinton Twp. The disease is sporadic and may be caused by infection with an uncommon combination of viruses. Two trees of sweet cherry, Windsor and an unnamed variety, in Saltfleet Twp., Wentworth Co., bore bumpy or furrowed fruit with some internal browning, and leaves suggestive of tatter leaf; suspected to be due to virus infection (R.S. Willison).

LITTLE CHERRY (virus). Little further spread is possible within the Kootenay districts, B.C., and none was reported. Symptom severity remains constant in the West Kootenays. In Creston Valley there was additional evidence, in some orchards, that fruit size can be increased by heavy fertilizer applications; but only some orchards respond, and even in them symptoms other than fruit size are unchanged (J.M. Wilks, M.F. Welsh).

MOTTLE LEAF (virus). One infected tree of Bing sweet cherry was seen in Creston Valley, B.C. The tree was removed. This is the second record

in this valley, the first having been found, and removed, in a neighbouring orchard in 1950. This second tree was evidently displaying second-year symptoms of a severe form of the disease (M. F. Welsh).

RING SPOTS (virus) Symptoms were more severe and seen on more trees of all sweet cherry varieties than usual. In several large plantings surveyed almost all trees showed ring spotting in some degree. Symptoms were most pronounced in Deacon and in Van budded to old Lambert. In Van the symptoms seem to be a shock reaction to viruses in the Lambert trees (M. F. Welsh).

SEVERE MOTTLE LEAF (virus) was seen on one sweet cherry tree (?Yellow Spanish) in Clinton Twp., Lincoln Co., Ont. One or two trees that showed similar symptoms last year in Louth Twp. were removed by the grower. The disease seems to be gradually spreading through the district. It is similar to the disease reported from B. C. and Wash., and also resembles the mild rugose mosaic and velvet mottle reported from Ont. (R. S. Willison).

YELLOWS (virus) caused moderate damage to Montmorency sour cherry at the Station, Kentville, N. S. (C. O. Gourley).

SEVERE NECROTIC SPOTTING (?virus). Five or six trees out of several hundred in a planting of Windsor sweet cherry at Winona, and 1 or 2 of an unknown variety at Stoney Creek, Wentworth Co., Ont., showed severe necrotic spotting of leaves, internal bark necrosis and reduced crop. One tree at Stoney Creek had very bumpy bark, with necrotic, slightly gummy lesions in the bumps. The trees at Winona bore malformed fruit with bumps and depressions; they had been noticed by the foreman in 1951, but the symptoms were stated to be more severe in 1952 (R. S. Willison).

PEACH

CROWN GALL (Agrobacterium tumefaciens) was seen on a tree in a home garden at Vancouver, B. C. The tree bore a large crop (H. N. W. Toms). Infection was 80% in a shipment of young trees from a nursery in Lincoln Co., Ont. (G. C. Chamberlain).

SCAB (Cladosporium carpophilum). Infection was very light in one orchard at Grand Pre, Kings Co., N. S. (C. O. Gourley).

CORYNEUM BLIGHT (Clasterosporium carpophilum). Isolated infections were seen on peach fruit in the Okanagan Valley, B. C. (D. L. McIntosh). In the Kootenays, infection was nil in adequately sprayed orchards, but was mod., with fruit spotting and killing of trees, in those that were not sprayed. A 5-year test spray programme, concluded in 1952, has proved convincingly that: (1) a late September spray of Bordeaux mixture, ferbam with wettable sulphur (1 lb. -3 lb. per 100 gal.), or fixed copper will prevent all new

infections on limbs or twigs, and in a few years will greatly reduce fruit and leaf infection; (2) the addition of a shuck-fall spray will further reduce infection in some seasons; (3) the pink spray has no demonstrable value. Most orchards now receive the September and shuck-fall sprays (M. F. Welsh, J. M. Wilks).

BROWN ROT (Monilinia (Sclerotinia) fructicola). In the Laboratory orchard, St. Catharines, Ont., only a trace of blossom blight occurred. Brown rot in harvested fruit from unsprayed trees after 9 days in storage was 63.7%, compared with 10-30% from sprayed trees. In general, brown rot was a serious factor in harvested fruit in the Niagara Peninsula, losses being considerable in shipment and at markets. Sluggish markets and a surplus of fruit resulted in much wastage of packed fruit (G. C. Chamberlain). Infection was light on Early Red Fire and other varieties in an orchard at Grand Pre, Kings Co., N.S. (C.O. Gourley).

LEAF CURL (Taphrina deformans). In the Kootenays, B.C., the 5-year spray test for Coryneum blight (q.v.) has shown that the late September spray of Bordeaux mixture or ferbam with wettable sulphur also gives excellent control of leaf curl. It is much easier to apply than the early spring application of lime-sulphur. A wet spring in 1952 favoured leaf curl in unsprayed orchards (M. F. Welsh, J. M. Wilks). Four trees at one end of an orchard in Lincoln Co., Ont., which could not be reached in applying the dormant spray, were seriously infected. No leaf curl was found in well-sprayed orchards. Scattered infections were seen in a young block of Elberta and Golden Jubilee, in Lincoln Co., where spraying was delayed (G. C. Chamberlain). Infection was 100% on unsprayed trees at Kentville, Mahone Bay and Shelburne, N.S. (D. W. Creelman). Phygon, substituted for Bordeaux mixture in the dormant spray failed to give any control (J. F. Hockey).

CANKER (Valsa spp.). V. cincta caused extensive cankers on 10-30 young trees of Elberta in an orchard in Pelham Twp., Welland Co., Ont. Wilting and die-back resulted. The trunk cankers followed winter injury due to excessive cultivation in 1951 and failure of wood to mature (G. C. Chamberlain). V. leucostoma caused severe cankers on most of the 1951 sucker growth on Early Red Fire at Grand Pre, N.S. Cankers to 18 in. long were numerous. Severe trunk cankers were present on some trees. Infections could be found on most trees of all varieties in the orchard (C.O. Gourley).

WILT (Verticillium albo-atrum) was found occasionally on 2-4-year-old Vedette, Valiant, and Veteran at Osoyoos, B.C., in orchards where Verticillium has been recorded on crops such as tomato and cantaloupe (G. E. Woolliams). Scattered trees were affected in a 5-year-old planting of Elberta in Lincoln Co., Ont., showing wilt and defoliation on one side (G. C. Chamberlain).

BACTERIAL BLIGHT (Xanthomonas pruni). Infection was moderate in June on the leaves of Early Red Fire at Grand Pre, N.S. (C.O. Gourley).

BUD FAILURE (cause unknown) was seen in several parts of the Okanagan Valley, B.C. The buds start to swell in the spring, but then die and slough off. It is sometimes related to boron deficiency, but in other cases the tissues of affected trees have a very high boron content. Trees seldom die, but the leaves are 4-6 weeks late. Trees appear normal at the end of the summer (C.G. Woodbridge).

LITTLE LEAF and ROSETTE (zinc deficiency) was seen on peach in the Okanagan Valley, B.C., for the first time (C.G. Woodbridge).

PLUM

BLACK KNOT (Dibotryon morbosum) was severe on damson plums in a neglected orchard at Sidney, B.C. (W. Jones). Scattered infections were seen in a block of 200 Stanley prune trees in Niagara Twp., Lincoln Co., Ont. (G.C. Chamberlain). A young orchard of several varieties at Grand Pre, N.S., was heavily infected. All trees and 20% of branches bore knots; although mainly on 1950 and 1951 growth, some knots on main branches made it impossible to prune without ruining trees (C.O. Gourley, D.W. Creelman). Black knot is serious on plums in Nfld. In five orchards examined, 75% of the trees were infected. A few growers cut out new knots, but usually start too late to save the trees (G.C. Morgan).

SHOT HOLE (Higginsia prunophorae) was heavy but caused slight damage in August at Fredericton, N.B. (S.R. Colpitts).

BLOSSOM BLIGHT (Monilinia laxa) was moderately severe on Yellow Egg in an orchard at Sidney, B.C. (W. Jones).

FRUIT ROT (Rhizopus nigricans). A car-load imported from western United States showed 77% of the fruit infected on arrival at Montreal, Que., on 19 Aug. (J.E. Jacques).

PLUM POCKET (Taphrina communis) occurred on young, unsprayed trees of Burbank at Kingston, Kings Co., N.S.; it was also severe on an unidentified variety at Upper Dyke (D.W. Creelman).

ROOTSTOCK INCOMPATIBILITY caused marked swelling at the budding point of about 20/200 5-year-old Stanley prune trees in the Niagara Peninsula, Ont. The affected trees, bearing their first crop, were unthrifty and broke off readily at the junction of stock and scion (G.C. Chamberlain).

SWOLLEN NODES (boron toxicity) was seen in the Okanagan Valley, B.C., on prune and apricot (q.v.) (G.C. Woodbridge).

WINTER INJURY. A row of 18 trees of Red June Japanese plum in Niagara Twp., Lincoln Co., Ont., showed extensive damage to main limbs and crotch. Valsa canker followed the injury (G. C. Chamberlain).

C. RIBES FRUITS

CURRANT

WHITE PINE BLISTER RUST (Cronartium ribicola). A few bushes of cultivated black currant were heavily infected at Rochfort Bridge, Alta. (A. W. Henry). Rust was heavy on black currants at Ste. Foy, Que., causing defoliation before the end of the season (D. Leblond). Infection on black currants was light at the Station, Kentville, N.S. (C. O. Gourley). Heavy infections caused moderate to severe damage to red currants in Queens Co., P. E. I. A light infection occurred near Charlottetown on what was supplied from a commercial nursery in Ont. as "the new rust-resistant black currant" and stated to have been produced at Ottawa (R. R. Hurst). Whether these plants are actually either Coronet or Crusader is not yet known.

ANTHRACNOSE (Drepanopeziza ribis) caused severe defoliation in a garden at Lethbridge, Alta. (F. R. Harper). A hedge of R. alpinum was heavily spotted and partly defoliated at Chambly, Que., in early Sept. (J. E. Jacques).

SEPTORIA LEAF SPOT (Mycosphaerella grossulariae). Infection was moderate to severe in a planting at Taber, Alta. (M. W. Cormack).

POWDERY MILDEW (Sphaerotheca mors-uvae) was severe in some garden and commercial plantings at Edmonton, Alta. (T. R. Davidson, A. W. Henry). It was reported from Muenster, Sask. (T. C. Vanterpool). Infection was heavy on a few plants of black currant at the University of Manitoba, Fort Garry, Man. (W. A. F. Hagborg). Infection was moderate, but damage light, on Coronet and Crusader black currant at the Station, Kentville, N.S., on 13 June (C. O. Gourley).

GOOSEBERRY

WHITE PINE BLISTER RUST (Cronartium ribicola). A trace was seen in Queens Co., P. E. I. (R. R. Hurst).

ANTHRACNOSE (Drepanopeziza ribis) caused considerable defoliation in a garden at Ucluelet, on the west coast of Vancouver I., B. C. (W. Jones). Infection was light on the varieties at the Station, Kentville, N.S. (C. O. Gourley).

SEPTORIA LEAF SPOT (Mycosphaerella ribis) was moderately heavy at Ste. Foy, Que. (D. Leblond). Traces were seen in Queens Co., P. E. I. (R. R. Hurst).

CANE BLIGHT (Nectria cinnabarina). Severely infected twigs were received from Normandin, Que., with no information as to the extent of the damage (H. N. Racicot).

CLUSTER CUP RUST (Puccinia caricis) was heavy on the young leaves of gooseberries at Metaghan River, Digby Co., N. S., on 23 May. It was moderately heavy on O-274 at Kentville (C. O. Gourley).

POWDERY MILDEW (Sphaerotheca mors-uvae) was heavy on fruit displayed for sale at Vancouver, B. C. (H. N. W. Toms). It was severe in a garden at Edmonton, Alta. (T. R. D.). Infection was light but general on the varieties at the Station, Kentville, N. S., on 14 July, despite one spray with sulphur (C. O. Gourley). Specimens were received from Curling, Nfld. (D. W. Creelman).

D. RUBUS FRUITS

BLACKBERRY

CANE GALL (Agrobacterium rubi) was found in all commercial plantings of Himalayan blackberry examined in the Saanich Peninsula, Vancouver I. B. C., and was present in 75% of the plants. Although damage was not severe, a general unthriftiness resulted (W. E. McKeen).

RUST (Gymnoconia peckiana). Infection was 25% on Rubus allegheniensis at Acacia Valley, Digby Co., N. S. (D. W. Creelman). A trace was seen on blackberries in a garden at Charlottetown, P. E. I. (R. R. Hurst).

AUCUBA MOSAIC (virus). Infection was 1% in Himalayan blackberry in the Saanich Peninsula, B. C. (W. E. McKeen).

MOSAIC (virus). A striking mosaic was seen on wild blackberry at Abbotsford, B. C. (R. Stace-Smith).

LOGANBERRY

CANE GALL (Agrobacterium rubi) infected 20% of the plants in 2 fields of boysenberry in the Saanich Peninsula, B. C., causing unthriftiness. Infection was 100% in two fields of loganberry and a trace in others; it caused imperfect ripening of the fruit and drying up of the plants (W. E. McKeen).

CROWN GALL (Agrobacterium tumefaciens) was present in varying amounts in all commercial plantings of loganberry in the Saanich Peninsula, B. C. It causes increasing unthriftiness and eventual death of the plants (W. E. McKeen).

SEPTORIA LEAF SPOT (Mycosphaerella rubi) attacked all leaves of boysenberry and loganberry in the Saanich Peninsula, B. C., causing moderate damage (W. E. McKeen).

RASPBERRY

CANE GALL (Agrobacterium rubi) was found on one plant in a garden in the Saanich Peninsula, B. C. (W. E. McKeen).

CROWN GALL (Agrobacterium tumefaciens) is heavy in the raspberry plantation at the Substation, MacDonald Corner, N. B., and seems to be spreading to adjacent apple seedlings. Most of the raspberries were brought in from Ont., and seemed to be healthy on arrival. Conditions seem to favour the development of crown gall on raspberry in some localities (J. L. Howatt). Occasional infections severely damaged Viking in Queens Co., P. E. I. (R. R. Hurst).

GREY MOULD WILT (Botrytis cinerea) caused considerable damage in a 1/2 acre plot of Washington on peat loam at South Burnaby, B. C., in 1949. Inadvertently omitted from P. D. S. The disease started with a wilt of the cane tips, which gradually spread down the cane. First noticed by the grower in August; when brought to the Laboratory in December, sclerotia were plentiful, with B. cinerea growing from them (H. N. W. Toms). Infection was 5-10% in a plantation of Viking at Centreville, Kings Co., N. S. Some lesions bore large sclerotia typical of the organism. Isolations from 3/24 small sclerotia from various affected canes also yielded it (K. A. Harrison). Previously reported under the name Cane Blight. J. F. Hockey (Sci. Agr. 32:150-152. 1952) adopts the above name from Wormald, who applied it to the disease in England.

SPUR BLIGHT (Didymella applanata) was heavy on canes received on 5 Aug. from Sydenham, Frontenac Co., Ont. (H. N. Racicot) Infection was moderate in e. Ont. in early summer. In the Picton-Belleville area it later became severe, causing considerable defoliation. It was not serious at Ottawa (A. T. Bolton). A 2-acre field at Chateauguay, Que., was severely affected, with yield reduced at least 25% (E. Lavallee). Traces were seen on Lloyd George in Queens Co., P. E. I. (R. R. Hurst).

ANTHRACNOSE (Elsinoe veneta) was moderately heavy on Washington at Kentville, N. S. There were few complaints this year of losses from anthracnose, probably because all stands were thinned by winter injury and conditions did not favour infection (K. A. Harrison). A trace was seen on Lloyd George in Queens Co., P. E. I. (R. R. Hurst). In two gardens at Topsail and one at St. John's, Nfld., Tayler and Latham were moderately infected. A trace was seen in Conception Bay (G. C. Morgan).

SEPTORIA LEAF SPOT (Mycosphaerella rubi). A 75% infection caused moderate damage to Rideau and Trent at Kentville, N. S., in August. No infection was seen on other varieties on trial. Such heavy infections are infrequent in N. S. (D. W. Creelman).

YELLOW RUST (Phragmidium rubi-idaei) was general but caused slight damage to Washington and Viking at the Station, Saanichton, B. C., but Milton, Newburg, Tahoma, Taylor, and Willamette continue to remain free from infection (W. R. Orchard). Yellow rust was general on Washington in the Fraser Valley, and infection was the most severe yet seen. In some plantings, especially on Lulu Island, it caused the leaves to dry up prematurely, reduced vigour and reduced the crop. It was not seen on Newburg and Willamette (R. E. Fitzpatrick, I. C. MacSwan). It was heavy, often causing severe defoliation, on Washington in the Chilliwack area, but was completely absent from Newburg, the other main variety (R. Stace-Smith). Some infection was seen in October in a farm garden near Fergus, Ont. (C. B. Kelly).

LATE YELLOW RUST (Pucciniastrum americanum). A light, scattered infection was seen on Viking in Louth Twp., Lincoln Co., Ont. (G. C. Chamberlain). Infection was heavy on both leaves and fruits of an unidentified red raspberry submitted from Billings Bridge, near Ottawa (H. N. Racicot). It caused extensive defoliation in the Ottawa district and the Picton-Belleville area. Viking and Latham were almost completely defoliated. Herbert, Madawaska, and Trent were unaffected (A. T. Bolton). It was very common on Viking at the end of the picking season at Kentville, N. S., attacking 50% of the smaller berries (K. A. Harrison).

POWDERY MILDEW (Sphaerotheca humuli) was common in a nursery planting of Latham at Arkona, Ont. (G. C. Chamberlain). Powdery mildew was seen in seedling plantations at Ottawa (A. T. Bolton). A moderate infection caused slight damage to Latham at Charlottetown, P. E. I. (R. R. Hurst).

VERTICILLIUM WILT (V. albo-atrum) was isolated from cultivated black raspberries showing streaking of canes and wilting of lower leaves, in the University test plots, Vancouver, B. C. (R. Stace-Smith). Ten plants in a planting of 2,000 one-year old Viking were killed in Lincoln Co., Ont. (G. C. Chamberlain). A trace was seen in Lloyd George in Queens Co., P. E. I. (R. R. Hurst).

MOSAIC (virus) Green mosaic was found on Cuthbert, Latham, Marlborough, and Newburg in the Fraser Valley, B. C., but not on Washington, although the latter variety develops typical symptoms when inoculated by grafting. Mottle mosaic was found commonly on most varieties grown in the Fraser Valley, and a mosaic is also widespread on Rubus parviflorus (R. Stace-Smith). Mosaic infection was nil to slight in a varietal planting at Edmonton, Alta. (T. R. D.). Mosaic was found in most small patches in the Ottawa district, Ont., but was seldom seen in the larger commercial plantings (A. T. Bolton). In P. E. I. most unrogued plantings of Viking have heavy mosaic infections. In a planting at Charlottetown roguing of infected and adjoining plants has been practised for 25 years and infection is only a trace, indicating that the practice is perfectly feasible (R. R. Hurst).

SEVERE LEAF CURL (virus). An apparently unrecorded virus disease was found in two locations on Washington in the interior of B. C. There is a severe stunting of the current year's growth, dwarfing and curling of leaves, and bud proliferation in the leaf axils that gives a rosette appearance. The plants are rapidly killed (R. Stace-Smith).

VEIN CHLOROSIS (virus) was found in Lloyd George in a nursery at Crescent Beach, B. C. First report to the Survey; originally described from Scotland (R. Stace-Smith).

WINTER INJURY. Raspberries at the Station, Lacombe, Alta., and at Lacombe Nurseries were 80-100% killed, whether laid down and covered or not. The canes were killed, but the roots were unaffected. Low temperatures in early spring are believed to have been responsible (G. B. Sanford). In Sask. the winter was very hard on raspberries. Even the hardiest varieties were considerably damaged; and others, e. g. Viking, killed back to ground level (R. J. Ledingham). Winter injury was seen in many plantations in e. Ont., especially where the plants were on unsuitable soil. It was also serious in a few plantings in w. Que. (A. T. Bolton). In Kings Co., N. S., damage to Viking was 100% at Centreville, 50% at Kentville, and 40% at North Kingston. Newburg suffered 25% loss at Kentville, and trace at Berwick. The most severe injury was associated with vigorous growth and inadequate hardening in the previous fall (K. A. Harrison).

E. OTHER FRUITS

BLUEBERRY

CROWN GALL (Agrobacterium ?tumefaciens). Galls were found on stems of a large percentage of plants in a field in the Saanich Peninsula, B. C., and caused a general unthriftiness (W. E. McKeen). It continues to be troublesome in coastal B. C. (R. E. Fitzpatrick, I. C. MacSwan).

BLOSSOM and TWIG BLIGHT (Botrytis cinerea) again was common in coastal B. C., following frost injury (I. C. MacSwan, R. E. Fitzpatrick). Blossom blight caused slight injury to Vaccinium corymbosum at Kentville, N. S., in June (D. W. Creelman).

WITCHES' BROOM RUST (Calyptospora goeppertiana). The odd infected clone of low-bush blueberry was seen in nearly every field visited in Charlotte Co., N. B., and Kings Co., N. S. (C. L. Lockhart). Two infected bushes were seen in a 1/4-acre planting of Vaccinium corymbosum at Kentville, N. S. (D. W. Creelman).

CANKER (Godronia cassandrae). Cankers appeared on year-old wood in June, in coastal B. C., but none were seen on current growth (R. E. Fitzpatrick, I. C. MacSwan). At Centreville, N. S., infection in Burlington and Jersey was about 40%; and damage was high because plants had to be heavily pruned. Rancacas and Stanley were only lightly affected. A light infection was seen at Aylesford. In a planting at Oxford, 5-10% of plants bore active overwintering cankers in May, but the eventual damage was not determined (C. L. Lockhart).

POWDERY MILDEW (Microsphaera alni var. vaccinii). A 25% infection caused slight defoliation of Vaccinium myrtilloides in September at South Alton, Kings Co., N.S. (D.W. Creelman).

LEAF and BLOSSOM BLIGHT (Monilinia vaccinii-corymbosi). A survey in Charlotte Co., N.B., indicated: Fields free from infection, 29.1%; fields with trace infections, 54.1%; fields with severe infection (50% or over), 16.6%. All severely infected fields were second-crop land; those with a trace were first or second crop. Sclerotia were found in June in old winnowing piles and under infected plants in several fields, but were not then sporulating. Incidence of the disease is reduced by burning. Traces were found on low-bush blueberries at Kentville, Steam Mill and Morristown, N.S. Isolations from blighted leaves invariably yielded the pathogen. In spray tests at Steam Mill fermate 2-100 gave best control, followed by Bordeaux mixture 10-15-100 and Basicop 3-100, each in one application at blossom time (C.L. Lockhart).

FRUIT ROT (Pestalotia vaccinii) was cultured from fallen fruit of low-bush blueberry at the Station, Kentville, N.S. (C.L. Lockhart).

LEAF SPOT (Septoria sp.). A trace occurred at Tower Hill, Charlotte Co., N.B., on low-bush blueberry. Considerable leaf-spotting of undetermined origin occurred in Charlotte Co., N.B., and Kings Co., N.S., causing some defoliation (C.L. Lockhart).

RUST (Thekopsora vacciniorum) was seen on Vaccinium ovalifolium on Goat, Dam, Grouse and Hollyburn Mts., near Vancouver, B.C. (H.N.W. Toms). This mountain species has also been found affected by this rust in the Shickshock Mts., Que. (D.B.O.S.). V. corymbosum was rusted at Pleasant Lake, Yarmouth Co., N.S. Rust was also seen on Gaylussacia baccata at North Wedgeport (D.W. Creelman).

GRAPE

CROWN GALL (Agrobacterium tumefaciens). Galls were present on the lower trunks of 10% of the vines in a 4-year-old block of Seibel 5437 at the Horticultural Experiment Station, Vineland, Ont.; shoot growth was greatly retarded (G.C. Chamberlain).

DEAD ARM (Fusicoccum viticola). In a 19-year-old vineyard of Concord in the Niagara Peninsula, Ont., 647/2044 (31.6%) of the vines were infected in either trunk or arms. The disease is widespread and general in the older vineyards (G.C. Chamberlain).

DOWNY MILDEW (Plasmopara viticola) was moderately heavy on 28 Aug. on foliage of Rogers Red near St. Catharines, Ont., but was not as important as usual in the district (G.C. Chamberlain). Severely infected fruit was received in late July from Pointe Claire, Que. (H.N. Racicot).

POWDERY MILDEW (Uncinula necator) was prevalent late in the season on Concord in Lincoln Co., Ont., but caused little damage. It is troublesome in a planting of French hybrids in Lincoln Co., loss of vines and dieback of canes being attributed to late infections. Bertill-Seyne 2846 is particularly susceptible; on 23 Sept. infection was 100% and defoliation 60-70% (G. C. Chamberlain). A trace was seen in a garden at Kentville, N. S. (D. W. Creelman).

CHLOROSIS (iron deficiency). Scattered areas of chlorosis occur annually in a number of vineyards in the Niagara Peninsula, Ont. Symptoms reach a peak in July and some recovery occurs late in the season (G. C. Chamberlain).

STRAWBERRY

CROWN DECAY (Armillaria mellea) affected a few plants of British Sovereign on newly cleared land at Saanichton, B. C. (W. Orchard).

GREY MOULD (Botrytis cinerea) was heavy on peduncles, hulls and berries, and even whole crowns of Senator Dunlap in the Berwick area, Kings Co., N. S. Satisfactory control was obtained on one farm through the application of one or two sprays of wettable sulphur (C. O. Gourley, D. W. Creelman). A light infection was seen in a few plantings of Premier in Nfld. (G. C. Morgan).

LEAF BLIGHT (Dendrophoma obscurans). Small amounts were seen in only a few plantations in e. Ont. (A. T. Bolton). The pathogen was associated with red hulls at Medford, Kings Co., N. S., but whether it was the primary cause of the condition is uncertain. This is the first report of the fungus from N. S., where the leaf blight phase of its attack has not yet been distinguished (D. W. Creelman, D. B. O. Savile).

LEAF SCORCH (Diplocarpon earliana) was limited in all plantations examined in e. Ont. at fruiting time, but became severe in August and September, especially in the Ottawa district. It varied from severe to very severe in Elgin, Senator Dunlap, Sparkle, Temple and Valentine. Many plants were killed and runner-formation was generally greatly reduced (A. T. Bolton). It was severe on Louise at Ste. Foy, Que. (D. Leblond).

LEAF BLOTCH (Gnomonia fructicola). A trace with the Zythia stage in fruit, was found on lower leaves of Senator Dunlap in association with other foliage diseases at Kentville, N. S. First report from N. S. (D. W. Creelman, D. B. O. Savile). It may be noted that under the name G. fragariae Alexopoulos and Cation (Mycol. 44:221-223. 1952) found it repeatedly in Mich., since first recognising it there in 1947. The organism is probably widespread in North America, but is easily overlooked.

LEAF SPOT (Mycosphaerella fragariae) was a trace on leaves sent in from a garden at Canora, Sask. (R. J. Ledingham). Infection was light at fruiting time in e. Ont., except for one heavy attack at Kemptville. It became severe in late summer, especially in the Ottawa district and along L. Ontario near Port Hope and Belleville. Considerable infection was seen on Senator Dunlap in w. Que. (A. T. Bolton). Leaf spot was heavy in a field at Rougemont, Rouville Co., Que. (J. E. Jacques). Infection was slight on Senator Dunlap at Jemseg, Queens Co., N. B. (S. R. Colpitts). In the Berwick area, Kings Co., N. S., infection was moderate on Senator Dunlap on 17 June. By July it was heavy on all varieties except Premier. Owing to the wet spring leaf spot built up rapidly and was a big factor in reducing the crop to about half the forecast yield. The conidial stage was collected on 19 Nov. on Fragaria vesca plants set out in a field of Jessie as virus indicators, at Central Chebogue, Yarmouth Co. (C. O. Gourley). On 5 Sept. at Charlottetown, P. E. I., leaf spot was heavy on Louise; light on Crimson Glow, Dorset, King, Mackenzie, Midland, Premier, Sparkle, Temple and Valentine; and nil on Catskill, Dresden, Senator Dunlap and Swanee (J. E. Campbell). Light infections were seen in many gardens in Nfld. (G. C. Morgan).

POWDERY MILDEW (Sphaerotheca humuli) was common on British Sovereign in Vancouver I., B. C., fruiting sparsely but causing reddening of the foliage (W. Jones). It was severe in localized patches in fields of British Sovereign in the lower Fraser Valley, B. C., causing slight reductions in yield (I. C. MacSwan, R. E. Fitzpatrick). Small amounts were found in several beds near Summerland, B. C. (G. E. Woolliams). It was found in three plantings of Senator Dunlap in the Ottawa district, Ont., in June, but none was seen in w. Que. (A. T. Bolton).

WILT (Verticillium albo-atrum). Infection was ca. 50% at Port Williams, Kings Co., N. S., in a planting of Senator Dunlap on land that had borne two or three successive crops of potatoes. The plants were small and depressed, with the outer leaves usually dead on 24 Oct. Runners were usually absent or were short with small runner plants (C. O. Gourley, D. W. Creelman).

LATENT VIRUSES of the non-persistent crinkle type were found in all of some 50 apparently healthy British Sovereign plants taken from various locations in the lower Fraser Valley, B. C. (R. E. Fitzpatrick).

FERTILIZER INJURY. Many plants of Valentine in a planting in Lincoln Co., Ont., showed marginal scorching or chlorosis on 21 May; mineral fertilizer had been applied after a heavy dressing with chicken manure (G. C. Chamberlain).

JUNE YELLOWS (genetic breakdown) was evident in several small areas in a 1/2 acre planting of Premier in Lincoln Co., Ont., on 20 May (G. C. Chamberlain). This condition was seen in many plantings in the Ottawa district for the first time. Affected plants were scattered and the trouble did not appear to spread. A single case was seen at St. Jean, Que. (A. T. Bolton). Forty percent of the plants were affected on 20 June in a plantation of Premier in Queens Co., N. B. (D. J. MacLeod).

ROOT ROT (cause unknown) was reported from Rosetown, Sask. (T. C. Vanterpool). It was seen in many plantations in e. Ont. in June and July, especially near Belleville and Picton, but infection never exceeded 5% and was usually 1-2%. None was seen in western Que. (A. T. Bolton). A moderately heavy infection occurred in the strawberry section near Grand Lake, N. B. Crop losses up to 50% resulted (J. L. Howatt). A planting of Senator Dunlap in Pictou Co., N. S., was 100% infected. The plants were completely devoid of fibrous roots (C. O. Gourley).