IV. DISEASES OF FRUIT CROPS

A. POME FRUITS

APPLE

STEM-END ROT (Botrytis cinerea) was sev. on McIntosh in cold storage at St. Pierre, Orleans Island, Que. in Feb. 15/19 fruits examined had stem-end lesions and 4/19 had blossom-end lesions (D. Leblond).

CANKER (Cytospora sp.) was sev. following fire injury to the base of one tree at St. Aubert, Que. The Tubercularia stage of a Nectria was also present (J.A. Parmelee).

LEAF SPOT (Entomosporium maculatum) was mod. on apple seedlings growing near infected pears at Ottawa (J.B. Julien). This organism is rarely reported on apple, and the present report is the first to the Survey (D.W.C.).

FIRE BLIGHT (Erwinia amylovora) continues to be a major problem in apples and crab apples in Sask. Specimens were received from 6 gardens in Saskatoon (R.J. Ledingham). At the Morden, Man. Exp. Farm a 3-year control program was initiated. Two applications of weak Bordeaux were made, the first at the early blossom stage. Twig infections were not found until after hold-over cankers had become active late in May, after which new spur and terminal twig infections multiplied rapidly. Beads of exudate were common. Attempts at eradication by the removal of cankers were ineffective because of the large number of infections (W.A.F. Hagborg). For the first time in several years fire blight caused noticeable injury on apple in s. Essex Co., Ont. About 10% of the trees in an orchard at Harrow had 1 or more large limbs killed by the organism (R.W. Walsh). Infection in Hastings Co., Ont. was light in 1957. Apparently much of the heavy infection seen in 1956 was killed out during the cold winter of 1956-57 (J. Cutcliffe). Fire blight was sl.-mod. in the Hemmingford-Franklin district of Que. It was more prevalent on Yellow Transparent, Fameuse and Golden Russet than on McIntosh (R. Crete). Specimens were received from five counties in Que. (D. Leblond).

RUST (Gymnosporangium spp.) In Prince Edward Co., Ont. G. juniperi-virginianae was much less prevalent in commercial orchards than in the previous two years (J. Cutcliffe). Fifty % of the fruit of one tree was heavily infected with G. clavipes at St. Aubert, Que. Nearby clumps of Juniperus communis had been found infected in May (J.A. Parmelee). Tr. infections of G. clavipes were found on Red Delicious and Wagner at Clarence, N.S., (J.F. Hockey).

POWDERY MILDEW (Podosphaera leucotricha) has increased very little in the Okanagon Valley, B.C. from the low level of incidence following the severe winter of 1955 (D.L. McIntosh). It was generally less prevalent in the laboratory orchard, St. Catharines, Ont. than in 1956. It appeared more sev. on trees sprayed with organic fungicides. The addition of a small amount of sulphur to the organic fungicides was beneficial in checking the disease. The occurrence of mildew on the variety Cortland was reported from the St. Catharines district (G.C. Chamberlain). Powdery mildew was common throughout the Niagara Peninsula on susc. varieties including Delicious and McIntosh (R. Wilcox, W.S. Carpenter). Infection was light in a nursery at Rougemont and tr. at St. Jean Baptiste, Que. (J. Ringuet).

BROWN ROT (Monilinia laxa) occurred in tr. amounts on the variety Newtown at Queen's Bay in the Kootenay district of B.C. (L.E. Lopatecki).

SCLEROTINIA ROT (Sclerotinia sclerotiorum). The calyx-end rot of apple caused by S. sclerotiorum, reported in 1956 (P.D.S. 36: 99. 1957), was again observed in the same orchard as well as 3 other orchards in the Coldbrook-Cambridge area of N.S. (J.F. Hockey).

SILVER LEAF (Stereum purpureum) affected half of one Jonathan tree at Cambridge, N.S. (R.G. Ross).

PINK MOLD ROT (Trichothecium roseum) caused sl. damage on the variety McIntosh on the market at Charlottetown, P.E.I. (R.R. Hurst).

SCAB (Venturia inaequalis) was general on unsprayed trees and particularly sev. on McIntosh on Vancouver Island (W. Newton). Losses in the Salmon Arm district of B.C. were particularly heavy, running to 100 per cent in some orchards of McIntosh. Prolonged rainy weather, prior to and just after bloom, favored scab development; made difficult the operation of spray equipment in many orchards; and prevented the application of necessary sprays at critical periods. Rainy weather during June and July aided the development of foliage scab in some districts of the Okanagan but fruit losses, except in a few orchards, were negligible. Scab was recorded for the first time in the Keremos district (D.L. McIntosh). It was observed at Vandura, Sask. (T.C. Vanterpool). Apple scab was mod.-sev. in orchards in s. and central Ont. Unsprayed trees in plots at St. Catharines had 100 per cent scabby fruit and the foliage was overrun with lesions. Scab in sprayed plots ranged from 0-41% (G.C. Chamberlain). Unprotected orchards in the Niagara Peninsula were heavily infected from a primary infection period 10, 11, 12 May. McIntosh was in full bloom at the time (R. Wilcox, W.S. Carpenter). There were several sev. infection periods in the Lambton-Huron area of Ont. just before and during bloom.

Some growers were forced to use full strength eradicant (mercury) during bloom. Foliage scab was general by mid-June but fruit infection was generally light. Weather conditions from mid-July on were favorable for controlling scab (J.R. Chard). In the Burlington-Toronto area infection periods occurred 10, 11, 12 May, 15 May, and 17-20 May; the last being the heaviest of the season. Scab was heavy early in the season but by careful spraying most growers produced a relatively clean crop of fruit. Severely affected orchards had 25% or more scab, but generally it was less than 10% (E.F. Muir). In Hastings and Prince Edward counties infection periods were more numerous and more sev. than in 1956. Two sl. infection periods occurred after the green tip stage in late April followed by 2 mod. and 3 heavy during May. Eradicants were used extensively with good results where properly applied. Approximately 5% of the crop, mostly from poorly sprayed blocks, showed scab infection at harvest time (J. Cutcliffe). In s.w. Que. sev. scab infections occurred on 9-10 May at the pre-pink stage, 14-15 May at early bloom, 22-23 May at late bloom and on 25-26 and 29 June. Light infections were recorded on 2 and 12 June. Scab lesions were evident about 1 June. Unsprayed orchards were heavily infected but most blocks were kept reasonably free of scab by frequent well-timed fungicide applications. Dry weather in Aug. helped check scab development and little pin-point scab was evident (L. Cinq-Mars). Scab was sl.-mod. even in unsprayed orchards of Fameuse, McIntosh, Melba and Lobo at Cap St. Ignace and L'Islet, Que. (L.J. Coulombe). Generally speaking, scab was well controlled in N.B. One grower, through poor timing of sprays, had an 80% infection on McIntosh (S.R. Colpitts). Ascospores matured early in N.B. but the first discharge was delayed until 15 May. There were 3 subsequent infection periods. Well sprayed orchards were clean but otherwise much early and considerable late pin-point scab developed (J.L. Howatt). Scab was unusually light in P.E.I. in 1957. Bright, dry weather prevailed during the bloom period (G.W. Ayers). A heavy infection was seen on Snow apples in Queen's Co., P.E.I. (R.R. Hurst). In N.S. infection periods were sufficiently far apart in 1957 to enable orchardists who used eradicant fungicides to save 2 spray applications before bloom. The development of a non-phytotoxic eradicant fungicide that could be used after bloom would save growers both time and money in spraying. The material Cyprex (n-dodecyl guanidine acetate) appears to hold some promise in this regard under N.S. conditions judging from preliminary tests (J.F.H.). Scab was sev. on fruit at St. John's and Bloomfield, Nfld. Trees on the Exp. Farm, St. John's, were sprayed regularly with captan and remained scab-free (O.A. Olsen). Unsprayed trees in the Bonavista Bay area and on the west coast were heavily infected (G.C. Morgan).

MOULDY CORE (saprophytic fungi) developed in the cores and calyx tube cavities of many abnormally large Delicious apples at Naramota, B.C. (D.L. McI.). About 15% of the crop of one 15-acre block of Delicious in the

Burlington-Toronto area was similarly affected. The affected applies, about 1 Aug., showed more color than others. When cut open they disclosed a blue mold, probably Penicillium sp. in the core (E.F. Muir).

COLLAR ROT (cause undetermined) killed 11 trees in an orchard at Gagetown, N.B. The bark was dead and the trees completely girdled at ground level (S.R. Colpitts).

STEM PITTING (virus) was identified in B.C. in 1955 in Virginia Crab and Robin hardy frameworks. It was suspected, in mild form in Robusta V frameworks and in the Golden Delicious variety. Surveys in 1957 included additional trees of Golden Delicious on Robusta V and all varieties on Haralsen frameworks, the framework now recommended for colder parts of the Okanagan Valley. Mild pitting was found in Robusta V and in Golden Delicious on this framework. No pitting was found in Haralsen (M.F. Welsh).

MINERAL DEFICIENCES. The most common deficiency in Okanagan orchards in B.C. was zinc. Orchards deficient in boron, magnesium, manganese and iron were also observed. Iron chelate sprays, particularly Sequestrine 330, appear promising in controlling iron deficiency, the most difficult to control (W.R. Foster). Boron deficiency was seen on the variety Wealthy in three orchards in the Burlington-Toronto area, Ont. (E.F. Muir). Magnesium deficiency symptoms were observed on vigorously growing young apple trees at St. Jean Baptiste, Que. (J. Ringuet).

SPRAY INJURY. Glyodin and lime applied during a very warm period caused leaf spotting and some flecking of fruit on McIntosh at Gagetown, N.B. (S.R.C.).

FROST INJURY. Frost damage caused heavy russeting and cracking on Astrachan at Stoney Creek, Ont. There were no marketable fruit from 20-25 trees (G.C. Chamberlain). Freezing temperatures on 16 and 17 May in the Oakville and Waterdown districts of Ont. caused 60% losses in localized areas, though frost damage generally was light (E.F.M.).

SCALD (non-parasitic) was seen on Lobo in storage at Quebec City (D.L.).

STORAGE BREAKDOWN (non-parasitic) was sev. on McIntosh and Cortland in storage at Ste. Petronille and Orleans Island, Que. (D.L.).

WINTER KILLING. Abnormally low temperatures during Jan. resulted in widespread injury to fruit trees throughout the orchard districts of s.w. Que. It is estimated that 10-15% of the apple trees have died or will die as a result of low temperature injury (L. Cinq-Mars). Symptoms

similar to silver leaf occurred quite generally in the affected orchards. The cause has not been determined (R. Crete).

PEAR

LEAF SPOT (Entomosporium maculatum) was sev. on pear root stocks in a nursery at Rougemont, Que. (J. Ringuet, D. Leblond).

FIRE BLIGHT (Erwinia amylovora) affected 10% of the blossom-bearing spurs at Penticton, B.C. Sev. infections occurred in pear orchards on the east side of Osoyoos Lake and in other parts of the Osoyoos, Oliver and Penticton districts, and the disease was recorded for the first time in the Keremos district. Rainy weather occurred during bloom and outbreaks of blossom blight were reported (W.R. Foster, D.L. McIntosh). It was more serious in Essex Co., Ont., than it had been for some time, About 5 per cent of the trees in two orchards at Harrow and Ruthven had to be destroyed and many others required sev. pruning. Antibiotic sprays at bloom gave varying degrees of control (R.W. Walsh). At Port Dalhousie, Ont., about 40 infection centers caused mod. damage to blossoms and spurs on the variety Bosc. A few branches were involved (G.C. Chamberlain). Fire blight was generally less prevalent in the Niagara district than in 1956 (R. Wilcox, W.S. Carpenter). Only two small plantings were seriously affected in the Burlington-Toronto area. Both cases were a result of a carried-over source of infection (E.F. Muir).

RUST (Gymnosporangium clavariaeforme) caused sl. damage at Pickering, Ont. (G.C.C.).

SOOTY BLOTCH (Leptothyrium pomi) was commonly seen on specimens received from Kent and Essex Counties, Ont. (R.W.W.). It was less prevalent in the Niagara district than in 1956 (R. Wilcox, W.S. Carpenter).

COLLAR ROT (Phytophthora cactorum). At Kelowna, B.C. 90% of the Anjou trees, 5 years of age, showed at least a tr. of infected tissue. Ten % of the trees of this age were girdled above ground (D.L. McI.).

PHYTOPHTHORA FRUIT ROT (P. cactorum) was tr. at Summerland, Peachland and Oliver, B.C. (D.L. McI.).

RHIZOPUS ROT (R. nigricans). A high percentage of Bartlett pears were affected in storage at Oliver, B.C. (D.L. McI.).

LEAF SPOT (Septoria pyricola). An epidemic of Septoria leaf spot occurred in a nursery at Poplar Hill, Ont. The varieties Bartlett and Bosc were sev. affected and Anjou and Clapps to a mod. degree. Duchess, Keiffer and Flemish Beauty were only sl. affected. Some 13,000 3-5 yr. old trees were involved (B.H. MacNeill).

SCAB (Venturia pirina) was common on unsprayed trees in s.w. Ont. (R.W.W.). It caused sev. fruit blemishes on 50-75% of Bartlett fruit in several orchards in the Vineland district. At St. Catharines 25% of fruits of Flemish Beauty and 20% of those of Howell were conspicuously scabbed. No infection occurred on neighbouring Beurre Bosc, Anjou, Duchess or Bartlett (G.C.C.). Scab was quite sev. on Bartlett in the e. end of the Niagara Peninsula even where control measures were applied. Dormant lime sulphur applied as a dilute spray gave better control than where applied in concentrated form. A concerted effort will have to be made to control this disease in 1958 (R.W., W.S.C.).

STONY PIT (virus). Pitting of Anjou pears has been recorded annually for several years in some orchards in the Okanagan-Similkameen valleys of B.C. The symptoms vary from scattered shallow pits without formation of stone cell tissue beneath, to sev. fruit distortion with abundant stony tissue in the flesh. In some forms there is browning to the core. Symptoms were unusually sev. in most affected orchards in 1957. An attempt is being made to distinguish between transmissible and non-transmissible forms (M.F. Welsh). All the fruit from two Anjou trees at St. Catharines, Ont. was badly malformed and pitted (G.C.C.).

FROST INJURY. Frost at bloom caused conspicuous russet banding around the calyx end of 90% of Bartlett fruits at Stoney Creek, Ont. About 30% of Keiffer pears in an orchard at Niagara-on-the-Lake were similarly affected (G.C.C.).

DROUGHT. Many pear trees on shallow soils in the Niagara Peninsula were scorched due to lack of moisture (R.W., W.S.C.).

STORAGE SCALD (non-parasitic). Scald was seen on pears in a retail store at Jonquiere, Que. (D. Leblond).

CHEMICAL INJURY. Injury following the application of parathion and malathion was found during hot weather and during sev. drought (R.W., W.S.C.).

B. STONE FRUITS

APRICOT

JACKET ROT (Botrytis cinerea) affected 10% of the fruit of Moorpark in May at Summerland, B.C. (D.L. McIntosh).

CORYNEUM BLIGHT (Clasterosporium carpophilum) caused sev. spotting on 75% of the fruit of 6 trees of an unknown variety at St. Catharines, Ont. (G.C. Chamberlain). This disease is becoming more prevalent as surface infection on fruit throughout the Niagara Peninsula. Little attempt has been made to control it. Growers will be encouraged in 1958 to use ferbam in the dormant and bloom period sprays (R. Wilcox, W.S. Carpenter).

BLOSSOM AND TWIG BLIGHT (Monilinia fructicola). Blossom blight was prevalent and sev. on several isolated trees in home orchards near Harrow, Ont. The fungus later advanced into the twigs causing cankers and dieback (C.D. McKeen).

PHYTOPHTHORA FRUIT ROT (P. cactorum) occurred on a small percentage of the fruit of some trees in the Summerland, Peachland and Oliver districts of B.C. (D.L. McI.).

RING POX (virus) (See Cherry twisted leaf).

CHERRY

CROWN GALL (Agrobacterium tumefaciens) was found on the roots of a mature Montmorency tree at St. Catharines, Ont. The tree was affected with crown rot (G.C. Chamberlain).

BLACK KNOT (Dibotryon morbosum) was observed as a sev. infection on one sour cherry tree in Kings Co., P.E.I. (R.R. Hurst).

LEAF SPOT (Higginsia hiemalis). A mod. infection caused partial defoliation of Montmorency at Port Dalhousie, Ont. The disease was present in many orchards in the St. Catharines district (G.C.C.). Leaf spot appeared later than usual in the Niagara area. It caused, however, considerable defoliation, particularly where air-blast machines were used and coverage was not adequate on the tops of trees. Extra post-harvest sprays were necessitated in many instances (R. Wilcox, W.S. Carpenter). The disease was less prevalent than usual in Hastings and Prince Edward Counties, Ont. It was well controlled by 4 or 5 pre-harvest sprays (J. Cutcliffe). Sl.-mod. infections in most orchards in the Lambton-Huron area. Little defoliation occurred until late in the season (J.R. Chard).

BROWN ROT (Monilinia fructicola) substantially reduced crops in the Interior of B.C. Regular pre-harvest spraying reduced losses. Both M. fructicola and M. laxa were involved in a blossom blight outbreak on Bing, Van and Lambert in the Renata and Boswell districts of B.C. (D.L. McIntosh). Brown rot continues to be a problem in the Kootenays and Arrow Lake districts of B.C. (W.R. Foster). The twig blight phase was prevalent on unsprayed trees in Essex Co., Ont. (R.W. Walsh). At St. Catharines, brown rot of mature fruit was of minor importance, mostly secondary to wind and bird damage or excessive cracking (G.C.C.). Heavy rains at picking time caused considerable splitting of sweet cherries in the Lambton-Huron area of Ont. Brown rot followed (J.R.C.) Specimens of blossom blight were received from Tracadie, N.B. (H.N. Racicot).

POWDERY MILDEW (Podosphaera oxyacanthae) caused sl. damage on 3-year old Montmorency trees at Louth, Ont. (G.C.C.). Powdery mildew has become quite prevalent in many Niagara Peninsula orchards causing early defoliation in some blocks. Some concern is felt as to the extent it may be affecting yields (R.W., W.S.C.).

WITCHES' BROOM (Taphrina cerasi) is present every year on old home garden and farmyard trees in the lower Fraser River Valley of B.C. (H.N.W. Toms).

WILT (Verticillium albo-atrum) is a serious factor in a 3-year old planting at St. Catharines, Ont. causing a wilting and drying up of foliage. Twenty % of the trees are likely to die (G.C.C.).

DECLINE (Nematodes). Xiphinema americanum was found at Saanichton, B.C. in large numbers in the root zone of a Bing cherry tree showing leaf yellowing, early leaf drop and many dead twigs associated with root injury (J.E. Bosher). An orchard at Louth, Ont., has developed slowly with trees about half normal saize for their age. Screening of five 1-lb. soil samples revealed the following nematode populations: Pratylenchus sp., 80-648; Paratylenchus sp., 40-200; Xiphimena sp., 8-104; Criconemoides sp., 0-8 (J.L. Townshend).

LAMBERT MOTTLE (virus) is less apparent in the Summerland area of B.C. than it was a few years ago. This is due to winter damage and tree removals in the older affected orchards. Small numbers of new infections are appearing in various parts of the area (T.B. Lott).

LITTLE CHERRY (virus) still remains unreported in the Okanagan and Similkameen Valleys of B.C. (T.B.L.). Symptoms were sev. and the disease caused considerable reduction in the tonnage of fruit shipped from the Kootenays, B.C. It was especially sev. on Lambert (J.M. Wilks). Symptoms were more sev. in the Creston Valley in 1957 than in the previous year (W.R.F.).

NECROTIC RING SPOT (virus) was quite noticeable in early June in varying degrees in a number of orchards throughout the Niagara Peninsula (R.W., W.S.C.).

TWISTED LEAF (virus). Twisted leaf of sweet cherry and apricot ring pox continue to appear in new localities in B.C. and show sl. local spread. The two diseases frequently occur naturally together. Experimental work has shown that twisted leaf can often be obtained from ring pox inoculum and vice versa. It appears that the two diseases are caused by two distinct viruses which usually occur together (T.B.L.).

YELLOWS (virus). The development of yellowing symptoms with leaf drop was quite sev. in all areas of the Niagara Peninsula in 1957. High temperatures in March and April and cool temperatures at petal fall favored symptom expression (R.W., W.S.C., G.C.C.). It was more prevalent than usual in the Lambton-Huron district. The great amt. of defoliation caused concern among growers (J.R. Chard). Most orchards in the Hastings-Prince Edward area contain yellows-infected trees (J. Cutcliffe).

T.B. Davidson and J.A. George report as follows on virus diseases of sour cherry in Ontario.

Surveys are conducted annually in 12 orchards with a total of 4,500 trees. The 1957 survey revealed that a larger number of yellows-infected trees showed symptoms and symptom expression was more sev. than in 1955 or 1956. However, the number of necrotic ring-spot-infected trees showing etching was lower, and the symptoms expressed less sev. than in the 2 previous years.

In new orchards propagated from virus-free bud wood, indexing of a total of 2,200 one year-old trees in 1955 and 1956 revealed that 1-8% were diseased. Presumably some of the root-stock used was carrying virus.

Two orchards, the 260-tree Troup orchard and the 305-tree Rittenhouse orchard were planted with virus-free trees in 1953. The Rittenhouse orchard is well isolated from any diseased trees while the Troup orchard is not. After 4 complete seasons no infection has occurred in the Rittenhouse block while 34 trees (13%) have become infected in the Troup orchard. Twenty-five of the 34 trees became infected during the fourth season.

DROUGHT. Many cherry trees in the Niagara district on shallow soils suffered sev. injury from lack of moisture (R.W., W.S.C.).

FROST INJURY. Spring frosts caused injury in pockets in the Burlington-Toronto area, losses ranging from 10-100%. The overall loss in the area was not great (E.F. Muir). Temperatures as low as 26°F on 17 May caused sev. blossom injury in Hastings and Prince Edward Counties. Combined with winter injury during -22°F. temperatures in January, it resulted in a cherry crop only 20% normal size (J.C.).

WINTER INJURY was responsible for the loss of 50% of young trees in an orchard planted at St. Catharines, Ont. in 1956. (G.C.C.). One plantation in the Toronto-Burlington area suffered a 5% loss of trees and considerable twig injury when winter temperatures dropped to -20°F. (E.F.M.). Sub-zero winter temperatures in Kings and Annapolis Counties, N.S. caused a 50% loss of the cherry crop (C.O. Gourley).

CHEMICAL INJURY. A number of instances of captan injury on the variety Schmidt were reported in the Niagara district of Ont. (R.W., W.S.C.).

PEACH

CROWN GALL (Agrobacterium tumefaciens). Three/20 young Elberta peach trees received from a nursery at St. Catharines, Ont., had gall infection (G.C. Chamberlain). Thirty/200 trees set out in 1956 in the Lambton-Huron were mod.-sev. infected with crown gall. Half of them were sufficiently sev. affected to cause death of the trees (J.R. Chard, C.B. Kelly).

DIE-BACK (Cytospora leucostoma) occurred in tr. amounts at Canard and Grand Pre, Kings Co., N.S. The fungus is considered to be a saprophyte on winter-killed wood (C.O. Gourley).

BLACK KNOT (Dibotryon morbosum). Mature perithecia and ascospores were found in 2 knots at Canard, N.S. in May. The Hormodendrum stage of the fungus was found fruiting at Grand Pré in Aug. (C.O.G.).

BLOSSOM BLIGHT and BROWN ROT (Monilinia fructicola). Blossom blight was negligible in the Niagara district in 1957 and brown rot became a factor only during the Elberta harvest season (R. Wilcox, W.S. Carpenter). Losses occasioned by brown rot in s.w. Ont. in early and mid-season varieties were sl.-mod. Late season varieties, such as Elberta are principally processing varieties, and for this purpose the processors insist on a greater degree of maturity than the firm ripe stage acceptable at the markets. Picked fruit is held in crates to ripen. In 1957 as much as 50-60% of stored Elberta peaches were destroyed by brown rot

and Rhizopus rot during a 2-day damp period. Losses were much lower where growers had left the fruit on the trees over this period. Cold storage of fruit was effective in reducing losses (G.C.C.). The situation was similar in the Lambton-Huron district of Ont. Losses of fruit awaiting processing at the canning factory at Forest were quite heavy (J.R. Chard).

PHYTOPHTHORA FRUIT ROT (P. cactorum) affected a small percentage of fruit on some trees in the Summerland, Peachland and Oliver districts of B.C. (D.L. McIntosh).

RHIZOPUS ROT (see BROWN ROT)

LEAF CURL (Taphrina deformans) occurred in a few home gardens in Vancouver, B.C. (H.N.W. Toms). Mod. infections occurred on newly planted Elberta trees in Niagara and Louth Townships, Ont. Leaf curl was not seen in any mature commercial orchards which had received a dormant fungicide spray either in the fall or spring (G.C.C.).

WILT (Verticillium albo-atrum). Exceptionally warm weather early in the growing season followed by a cold, wet period predisposed peaches and sweet and sour cherries to show symptoms of Verticillium wilt in the Niagara district in 1957. Many peach trees recovered later in the season but mortality was noted in some cherry orchards (R. Wilcox, W.S. Carpenter). Two/15 trees were affected in a young planting at Niagara-on-the-Lake (G.C.C.).

BACTERIAL SPOT (Xanthomonas pruni) was common on Victory peach foliage in the Niagara district. Fruit infection was not a problem in 1957 (R.W., W.S.C.). Moderate leaf drop and spotting occurred on Elberta in several orchards at Niagara-on-the-Lake (G.C.C.).

WESTERN X-DISEASE (virus). Fifteen % of the trees in a large block in the Niagara district showed prominent symptoms of this disease. Numerous choke cherries similarly affected were noted within 500 yards of the orchard (R.W., W.S.C.).

WINTER INJURY. Sub-zero temperatures to about -14°F. in some areas, 15-16 Jan., caused sev. bud damage in localized parts of the Niagara Peninsula. Dead wood was common. Vedette appeared to be the hardest hit (R.W., W.S.C.). Mid-winter temperatures of -22°F. were responsible for the complete failure of the 1957 peach crop in Kings and Annapolis Counties, N.S. (C.O.G.).

CHEMICAL INJURY. Spray injuries to peach foliage were noted early in June in the Niagara district. Various combinations of materials

were involved including captan, malathion and DDT; paste sulphur and parathion; and microfine sulphur and parathion. There appeared to be no reason for these injuries other than the possibility that the sev. cold weather in Jan. 1957 predisposed the trees to injury. The foliage appeared to be very tender (R.W., W.S.C.).

PLUM

DIE BACK (Cytospora leucostoma). The organism is considered in N.S. to be primarily a saprophyte on winter killed wood (C.O. Gourley).

BLACK KNOT (Dibotryon morbosum). It is an exception to find a plum tree in the Hastings and Prince Edward area of Ont. which is not infected with black knot. No commercial acreages are involved and few attempts are made to control it (J. Cutcliffe). Black knot was sev. in a block of 25 trees at Rougemont, Que. (R. Crete). It is widespread in N.B., mostly in home gardens (S.R. Colpitts). Black knot was seen at Charlottetown and other localities in Queens Co., P.E.I. (R.R. Hurst, J.E. Campbell). A 2-acre block at Grand Pre, N.S. was completely destroyed by black knot. Although the trees were not dead, it would be impossible to prune out all the knots and still save the trees. Infections ran as high as 75% in other parts of Kings Co. (C.O.G.). The disease has reached epidemic proportions within 2 years of its first appearance in the South East Placentia area of Nfld. Six/7 orchards in the district were heavily infected (O.A. Olsen), and heavy infections were seen on plums and cherries at Bonavista Bay and Grand Falls (G.C. Morgan).

BROWN ROT (Monilinia fructicola) caused a 60% loss of crop at Brentwood, Vancouver Island, B.C. It was general in all areas of the Island and caused heavy losses except where spray programmes were strictly followed (W. Newton). A tr. was seen at South East Placentia, Nfld. (O.A.O.).

PLUM POCKETS (Taphrina pruni). Tr. infections were seen at 3 localities in Sask. (T.C. Vanterpool). Specimens were received from the Thunder Bay and Russell districts of Ont. (H.N. Racicot). Specimens seen from Woodstock, Ont., on the variety Assiniboine. Infection was said to be confined to 1 of several trees in a home garden (G.C. Chamberlain).

WILT (Verticillium albo-atrum). Five/50 trees in a 3-year old planting of Golden Early at Niagara-on-the-Lake, Ont. were infected. Affected trees show pronounced wilt, especially on 1 side of the tree. Several trees are likely to die (G.C.C.).

BACTERIAL SPOT (Xanthomonas pruni). Four affected Burbank trees seen at Niagara-on-the-Lake, Ont. The foliage showed considerable spotting and shot-holing, but fruit infection was sl. (G.C.C.).

DIE-BACK AND GUMMOSIS (cause undetermined) was mod. on plums at Rimouski, Que. Defoliation of trees and gummosis at the stem-end of fruit was observed (D. Leblond).

CHEMICAL INJURY. A mixture of captan, malathion and DDT in the curculio sprays caused injury to several varieties of plums in 1 orchard in the Niagara Peninsula. Injury occurred at the blossom end where spray droplets accumulated (R.H. Wilcox, W.S. Carpenter).

PRUNE

CROWN GALL (Agrobacterium tumefaciens). Sl. infections were seen on Stanley prune stock brought from Ont. and planted at Kentville, N.S. (C.O. Gourley).

RUST (Tranzchelia pruni-spinosae var. discolor). Four prune trees near Saanichton, B.C. were sev. defoliated by rust. It also occurred on two trees at Sidney. The I stage was found on leaves of Anemone coronaria in the same garden (W. Newton). Examination of infected leaves showed that the rust was the variety discolor (see Dunegan, Phytopath. 28: 411-427, 1938) (D.W.C.).

RUSSET (physiological). Russet, probably caused by cold checking early in the season caused 10-25% of Italian prune fruit in the St. Catharines district to be discarded before deliveries were accepted for processing (G.C. Chamberlain).

C. RIBES FRUITS

CURRANT

WHITE PINE BLISTER RUST (Cronartium ribicola). Mod. infection on red currants at Clearwater Bay, Ont. (W.L. Gordon). Sev. infections were seen in garden plantings of black currant at Ottawa and Carp, Ont. (H.N. Racicot, H.S. Thompson). Blister rust infections ranged from 33-100% in 5 nurseries in Que. Both black and red currants were affected (J. Ringuet). It was mod. and caused sl. damage to black currants at Springfield, P.E.I. (J. E. Campbell). A 20% infection caused 5% defoliation of black varieties at Kentville, N.S. (C.O. Gourley). A tr. was recorded on captan-sprayed bushes of the variety Kerry on the Exp. Farm, St. John's, Nfld. (O.A. Olsen).

RASPBERRY

CROWN GALL (Agrobacterium tumefaciens) was observed in 3/26 nurseries inspected in Que. Infections were 2, 3, and 25% respectively (J. Ringuet). Nine/20 plants in a garden at Moncton, N.B. were killed by crown gall (S.R. Colpitts). A sev. infection was observed at Keppoch, P.E.I. (J.E. Campbell). Crown gall was tr. on Newburg in a planting at Melvern Square, N.S. (C.O. Gourley).

GRAY MOLD (Botrytis cinerea) was sev. on twigs and berries of Viking and Newburg at Ste. Foy, Que. The infection apparently came from a nearby heavily infected strawberry patch (D. Leblond).

GRAY MOLD WILT (Botrytis cinerea) was sev. on sawdust mulched plants at the Exp. Farm, Kentville, N.S. Counts made in late season showed the following percentages of canes affected: Willamette 47, Trent 38, Newburg 35, Malling Promise 34, Walfried 28, Viking 28, Early Red 21, Milton 18. An adjacent row of Viking in clean cultivation showed approximately 2% affected canes (J.F. Hockey).

SPUR BLIGHT (Didymella applanta) was prevalent in most plantings in the Niagara Peninsula, Ont. (R. Wilcox, W.S. Carpenter). It was observed in many garden patches and in unsprayed commercial plantings in Hastings and Prince Edward Counties, Ont. (J. Cutcliffe). Spur blight was mod. on Newburg and sev. on Viking at Ste. Foy, Que. It was also observed at Grande Baie and Levis (D.L.). A mod. infection caused sl. damage at Keppoch, P.E.I. (J.E.C.). Sev. outbreaks appeared late in the season on a number of varieties in Kings Co., N.S. (K.A. Harrison).

ANTHRACNOSE (Elsinoe veneta) was sev. in an inadequately sprayed commercial planting in Mersa Twp., Ont. Many young canes were girdled and killed (R.W. Walsh). Several plantings of Taylor at St. Catharines, Ont. had mod. infections resulting in crumbly berries of poor size. All parts of the canes were affected (G.C. Chamberlain). Anthracnose was prevalent in most patches in the Niagara Peninsula (R.W., W.S.C.). It was common in unsprayed plantings on both red and purple varieties in Hastings and Prince Edward Counties. Most growers achieve commercial control by applying a delayed dormant and a pre-bloom spray (J.C.). Mod. on Viking and sev. on Newburg at Ste. Foy, Que. (D.L.). A sl. infection was seen on nursery stock at York, P.E.I. (J.E.C.). A number of yellow fruited seedlings at Kentville, N.S. were sev. attacked. It was not sev. on standard varieties where control measures had been carried out (K.A.H.) Five-10% of the canes of Trent and Madawaska were infected at the Exp. Farm at St. John's, Nfld. (O.A. Olsen).

CANE BLIGHT (Leptosphaeria coniothyrium) was tr. in 2 plantings at Saanichton, B.C. (W. Newton).

YELLOW RUST (Phragmidium rubi-idaei) was light in the lower Fraser Valley, B.C. There were no reports from home gardeners in the Vancouver area (H.N.W. Toms).

LATE LEAF RUST (Pucciniastrum maericanum) was sl. in 6/26 Que. nurseries (J. Ringuet). A mod. infection was seen in a certified raspberry plantation at York, P.E.I. (J.E.C.). Infections on leaves and fruit were not as sev. in 1957 as usual in Kings and Yarmouth Counties, N.S. (K.A.H.).

POWDERY MILDEW (Sphaerotheca humuli). A mod. infection on Viking at Niagara Falls, Ont., caused stunting of tip growth of new canes (G.C.C.). Mildew was seen in 1/26 nurseries inspected in Que. (J. Ringue). Sl. infections were seen on Latham in Queens Co., P.E.I. (R.R. Hurst).

WILT (Verticillium albo-atrum). Wilt infected plants were received from the Exp. Farm, Melfort, Sask. (R.J. Ledingham). Black raspberries were mod. infected by wilt and bluestem symptoms were evident in 10% of the canes of Viking at St. Catharines, Ont. (G.C.C.).

ROOT NEMATODES (various species). Pratylenchus penetrans, Paratylenchus sp. and Xiphinema americanum were found in significant numbers in the root zone of three plantings showing weak growth on Vancouver Island, B.C. (J.E. Bosher).

LEAF CURL (virus). A 1-2% infection occurred in scattered areas in a 5-year old planting at Niagara Falls, Ont. Plants were unproductive and new shoots greatly stunted (G.C.C.). Leaf curl affected 20% of the variety Golden Queen in 1/26 Que. nurseries (J. Ringuet).

MOSAIC (virus). Ninety % of the canes in a 5-yr. old planting of Viking at Niagara Falls, Ont. were infected. Production was greatly reduced (G.C.C.). Mosaic is present in most plantings in Prince Edward Co., Ont. Some growers keep the disease down by rogueing (J.C.). It was seen in 15/26 Que. nurseries. Infections ranged from 0.2-4% (J. Ringuet). A 5% infection was seen at Moncton, N.B. (S.R.C.). Two/100 plants of Viking set out in 1926 showed mosaic at Charlottetown, P.E.I. Careful rogueing has kept this planting free from virus and the patch remains highly productive (R.R. Hurst).

ROOT SUFFOCATION. The plants in two patches on Vancouver Island, B.C., were killed out as the result of a high water table (W.N.).

WINTER INJURY. A number of plantings in the Niagara district, Ont., were badly killed back by sev. low temperatures in January 1957 (R. Wilcox, W.S. Carpenter).

E. OTHER FRUITS

BLUEBERRY

CROWN GALL (Agrobacterium tumefaciens) affected 1% of the stems of Cabot at Centerville, Kings Co., N.S. (C.L. Lockhart).

RED LEAF (Exobasidium vaccinii). Fields at Canaan Road and Half-Way River, Cumb. Co., N.S. showed 18 and 25% infection respectively. The av. infection in blueberry fields in N.S. was about 0.3% (C.L.L.). Red leaf occurred as a few scattered patches in fields at Avondale, Nfld. (O.A. Olsen).

CANKER (Fusicoccum putrefaciens) was present in many highbush blueberry plantings in the lower Fraser Valley, B.C. Damage was sl. (H.N.W. Toms). A 1% infection was observed on seedlings at the Exp. Farm, Kentville, N.S. Canker is also prevalent in a commercial field at Centerville, Kings Co., N.S. Heavy pruning in an effort to control the disease resulted in a 25% reduction of potential fruiting stems (C.L.L.).

POWDERY MILDEW (Microsphaera alni var. vaccinii). Tr. infections of mildew occurred on lowbush blueberries at Steam Mill, N.S. (C.L.L.).

TWIG AND BLOSSOM BLIGHT (Monilinia vaccinii-corymbosi). In general only tr. infections were found in first crop fields in N.B. and N.S. About 40% of the crop of a second crop field at Grafton, N.S. was lost as the protective dust was applied too late. Apothecia were found in fields at Steam Mill, N.S. and in a field in Cumberland Co. early in May. These had been previously unobserved in N.S. Observations indicate that the cultural burning is very effective in destroying mummy cups and aids blight control by supplementing the fungicidal dusts. Apothecia were also found in highbush plantings at Kentville and Aylesford, N.S. Good control was obtained by disturbing the mummy cups by cultivation. Tr. infections of blight were seen at Kentville (C.L.L.).

DIEBACK (Phomopsis vaccinii). Eleven/68 tagged blueberry stems at Steam Mill, N.S., failed to set fruit due to dieback. Counts in a second crop field at Steam Mill and one at Cross Roads, Cumb. Co., N.S., showed 37.3 and 26.6 % of the twigs affected respectively. This represented a 7.5% loss of crop. No losses occurred in first crop fields as P. vaccinii appears on twigs only after they have produced a crop. The conidial stage of Valsa delicatula was found associated with Phomopsis dieback at Steam Mill, N.S. (C.L.L.).

WITCHES' BROOM (Pucciniastrum goeppertianum) was a tr. on lowbush blueberries at Avondale, Nfld. (O.A. Olsen).

LEAF RUST (Pucciniastrum vaccinii). Infection was sev. on some clones in Cumberland, Colchester and Kings Counties, N.S. Some defoliation of lower leaves occurred though damage was only sl. due to the lateness of infection (C.L.L.).

LEAF SPOT (Vermicularia sp.). First seen on herbarium material collected at Upper Island Cove; Nfld. in 1955. Tr. infections were seen at Glen Haven, Halifax Co., N.S. (C.L.L.).

MOSAIC (virus) was found on one highbush plant at the Exp. Farm, Kentville, N.S. Mosaic was described by E.H. Varney, Phytopathology, 47: 307-309. 1957. (C.L.L.).

WINTER INJURY. Flower buds were damaged in most fields in N.B. and N.S. averaging 5% loss of buds. The heaviest damage seen was at Advocate, N.S., where counts in one field showed 24.9% of the buds affected. (C.L.L.).

GRAPE

DEAD ARM (Fusicoccum viticola) is common in many vineyards of 10 years or more of age in the Niagara district. It is responsible for the death of parts or all of some vines (G.C. Chamberlain).

BLACK ROT (Guignardia bidwellii). A 10% infection on the variety Diamond was seen at St. Catharines, Ont. This disease is rarely encountered in the Niagara Peninsula. Diamond seems particularly susceptible (G.C.C.).

DOWNY MILDEW (Plasmopara viticola) was general on the foliage of Delaware, Salem, Fredonia and Agawam in the Niagara district. Some vines, especially Salem were sev. affected. Fifteen % of the fruit clusters

in an unsprayed portion of a Fredonia planting were affected (G.C.C.). Downy mildew was seen on Fredonia, Van Buren and Agawam about 2 weeks after bloom. Many straggly fruit clusters resulted (R. Wilcox, W.S. Carpenter). The disease was serious in the Burlington-Toronto area in vineyards where no sprays or only one spray was applied (E.F. Muir).

CHEMICAL INJURY. The grape is extremely susceptible to injury from 2,4-D vapor and each year injury occurs in the form of stunting of terminal growth and malformation of leaves as a result of roadside spraying for weed control. One serious case of damage was observed in the St. Catharines area in 1957. The vines showed a marked foliage wilting and drying up with extensive defoliation in mid-July. It is considered doubtful that the vines will recover (G.C.C.). Several vineyards in the Niagara district were affected by 2,4-D. One planting of 14 acres near Thorold, Ont., was a complete loss (R.W., W.S.C.).

FROST INJURY. Temperatures as low as 23°F. on 4 and 5 May in some areas of the Niagara district caused extensive bud injury to grapes. Further injury occurred on 17 May when temperatures dropped to 26°F. Considerable russeting also occurred (R.W., W.S.C.).

MANGANESE DEFICIENCY. Several isolated cases of manganese deficiency were reported shortly after growth started (R.W., W.S.C.).

STRAWBERRY

Strawberry Disease Survey in Ontario - 1957

A.T. Bolton

A disease survey of strawberry-growing areas in Ontario was made during the late summer and fall of 1957. Many strawberry plantations throughout these areas were found to be in poor condition.

In Norfolk county, about 100 acres of strawberry plants were observed. Premier plantings in particular showed lack of vigor, and many plants failed to produce runners. Several other varieties showed much better growth and runner production, although these also produced fewer runners than normal. Other varieties examined included Pocahontas, Catskill, Sparkle, and Empire. The new variety, Redcoat, introduced by the Central Experimental Farm, Ottawa, showed good vigor.

Other areas surveyed in Western Ontario included the Niagara district, and an area near Leamington. In these areas, the plants showed the same lack of vigor. In two fields of Premier near Leamington, constituting