IV. DISEASES OF FRUIT CROPS

A. POME FRUITS

APPLE

CROWN GALL (Agrobacterium tumefaciens) was seen on a few young trees at the Experimental Station, Scott, Sask. (T.C. Vanterpool).

FRUIT ROT (Botrytis cinerea). Several reports of a calyx-end rot of Delicious were received at harvest time from the Creston Valley, B.C. In early November there were further reports of the rot developing in storage. Isolations yielded B. cinerea consistently. The weather was warm and moist at harvest time (M.F. Welsh).

FIRE BLIGHT (Erwinia amylovora). Specimens were received from London, Ont. (E.H. Garrard), and on Wealthy and a crab apple from St. Lambert, Que. (H.N. Racicot). Blight was seen on Sandow at Hemmingford and crab apples at Berthierville (F. Godbout). The neglected apple trees at one time planted along highways in Quebec are certainly a source of outbreaks of fireblight; but no great number of complaints was received this year (O. Caron). Blight was heavy in an abandoned orchard in Queens Co., P.E.I. New infections were not numerous, but the accumulated effect of several seasons' infection was severe. The disease does not seem to be found outside neglected orchards in P.E.I. (R.R. Hurst).

FRUIT ROT (Gloeosporium album). Infection was slight in December in many varieties stored at the Experimental Station, Fredericton, N.B. (J.L. Howatt). G. album caused 91% of the infection in Northern Spy with storage rot at the Station, Kentville, N.S., in April 1950 (K.A. Harrison).

RUST (Gymnosporangium spp.). G. sp. was reported to be fairly common on Cortland, Delicious, Northwest Greening and Wealthy in Prince Edward Co., Ont. (G.C. Chamberlain). Fruits with sterile infections were received from Almonte (H.N. Racicot, K.M. Graham). G. clavipes was seen at Ste. Anne de la Pocatiere, Que., in many locations, after a lapse of 8 years. Bethel Crab, Golden Russett, Greening, Melba, and Yellow Transparent were most affected (A. Payette). Infection by G. clavipes ranged from 0 to 60% in orchards surveyed in Kings and Annapolis Co., N.S. Aecia were found in several heavily infected orchards. This was the most severe outbreak recorded in 26 years by this laboratory (J.F. Hockey).

EUROPEAN CANKER (Nectria galligena). A single dead tree of King with many cankers was seen at Coldbrook, N.S. (C.L. Lockhart).

POWDERY MILDEW (Podosphaera leucotricha). Seedlings at Kentville, N.S., that were 100% affected in 1949, showed 30% infection in 1950. The disease usually persists only 2-3 years (J.F. Hockey).

BLACK ROT CANKER (Physalospora obtusa). Diseased twigs were received from near London, Ont. (G.C. Chamberlain).

CANKER (Tympanis conspersa Fr.) was found on Ben Davis and Black Twig in a neglected orchard near Kentville, N.S. The conidial (Pleurophomella) stage was present and was identified by J.W. Groves who is familiar with the fungus on Malus and Sorbus (K.A. Harrison, C.L. Lockhart).

SCAB (Venturia inaequalis) was very light in Creston Valley, B.C., but there was some late infection and a danger of storage scab following a very wet harvest. In the moister parts of the Kootenays, around Nelson, scab was severe. Fruit infection was 100% in unsprayed McIntosh. Damage was lighter but still severe in other varieties (M.F. Welsh).

Scab was fairly heavy in Norfolk, Elgin, York and Peel Co., Ont., and light in the Georgian Bay area. A few orchards were heavily scabbed in the Niagara Peninsula. In the laboratory orchard, St. Catharines, infection was 3-20% on sprayed and 60-80% on unsprayed trees. Most of this scab was late, pin-point infection resulting from nearly continuous rain 25 Aug. to 1 Sept. McIntosh in Louth Twp., Lincoln Co., showed heavy fruit infection and very heavy infection of terminal leaves, followed by scorching, on 19 July (G.C. Chamberlain).

In Missisquoi Co., Que., fruit infection was about 10% in well-sprayed orchards. Primary infections began to show at the pre-pink stage. Frequent rains favoured infection until mid-summer, necessitating 9-11 sprays (R. Desmarteau). In Rouville and adjacent counties ascospores matured very early, but cold, dry weather delayed their release and checked tree growth. A 45 hour rain on 18-19 May caused primary infections, which were visible on 7 June. Intermittent rain from 30 May to 1 June brought a second, much heavier, infection during bloom, which resulted in much foliage scab about 15 June. Rapid leaf growth at this time allowed much leaf infection, but the slower-developing fruit escaped infection in well-sprayed orchards. Continued rain in June and July made 5 to 8 cover sprays necessary. Adequately protected orchards had 10-20% fruit infection, but in others up to 90% of fruit was scabby. Growers who tried to check scab with lime sulphur after it was established only caused injury to the trees. Microfine sulphurs and ferbam gave better results (L. Cinq-Mars). The season was one of the worst on record for scab in south-western Que. Abundant mature ascospores at bud break, prolonged ascospore discharge, cool weather with frequent rain, and hindrance to spraying by high wind all contributed to the epidemic (F. Godbout). Infection about Quebec City was moderate to severe. Adequate spraying gave good control, about 5-6 applications being needed (O. Caron). Infection was moderate and damage slight on Cortland, Fameuse and McIntosh in Nicolet Co.; infection was traced to prolonged rain, 10-11 June, but subsequent sprays of lime-sulphur checked the spread (C. Perrault). Cool, wet weather at Ste. Anne de la Pocatiere in late June brought on a scab epidemic in unsprayed orchards, but initiation of spraying even at that time allowed clean fruit to be harvested (A. Payette).

On 11 May apple scab spores began to mature in the old leaves on the ground at Fredericton, N.B., and a slight discharge of spores was recorded. Apple bud development at this time varied according to variety from delayed dormant to early pre-pink. On 17 May a slight to moderate ascospore discharge was recorded during the early pre-pink stage. The weather was extremely warm

from 23 to 28 May inclusive, and bud development was very rapid. Most orchards were in partial to full bloom on 28 May and the leaves developed very rapidly following bloom. Hot, dry weather, unfavourable to scab, continued until 15 June. Secondary infection was first seen on 10 July (S.F. Clarkson). Infection was very slight to severe in orchards, according to the effectiveness of spraying. In general, control was good in well-sprayed orchards (J.L. Howatt).

No serious scab infection periods occurred in N.S. until the end of the bloom period, when prolonged rain occurred during a week-end when a spray should have been applied. All materials used at this stage are protectant fungicides only, so it was natural that a heavy scab development took place. McIntosh appeared to suffer the most. Before the end of June many blocks of McIntosh had from 15% - 40% foliage infection. Several additional infection periods were experienced during June and early July. Growers who applied protective sprays to their orchards at frequent intervals during the early summer were successful in harvesting good commercial crops, but many others suffered appreciable losses from scab. It is interesting to note that good control of scab was obtained by the use of eradicant fungicides (Tag and Phygon) applied after heavy infection periods (J.F. Hockey).

MOSAIC (virus). An orchard at Woodville, N.S., showed over 20% infection. It had been frameworked in 1949 from Stark to Cortland and Northern Spy. The Starks were apparently infected prior to frameworking (J.F. Hockey).

BITTER PIT (physiological). Infected fruits of Cox Orange were brought in from a home garden at Vancouver, B.C. The fruit was very large for the variety. The owner stated that in 1949, when the fruit was smaller, no bitter pit was present. Nearly all the fruit on a single tree was infected (I.C. MacSwan). Bitter pit infection ranged from 2 to 5% in 5 orchards in the Niagara Peninsula, Ont. Baldwin, Cortland, Delicious, Northern Spy, Northwest Greening and Wolf River were affected (G.C. Chamberlain). A small percentage of pitting was noted in a few stored lots of Cortland and Northern Spy in N.B. (J.L. Howatt). It was seen at harvest in a number of varieties in N.S., but infection was usually less than 5% (J.F. Hockey).

DROUGHT SPOT, etc. (boron deficiency). Symptoms of boron deficiency are now seldom seen in the Okanagan Valley, B.C., but indications of boron toxicity are becoming more common. The injury is usually caused by uneven application of boric acid, and is most commonly seen in one-and two-year-old trees (C.G. Woodbridge). A few affected fruits were seen on McIntosh trees in part of an orchard at Cambridge, N.S. (J.F. Hockey).

CHLOROSIS (?lime-induced iron deficiency) is found in tree fruits in areas of poor soil drainage in the Okanagan Valley, B.C. The lack of drainage causes a high soluble salt content. Chlorotic plants may have a normal iron content, but the iron is evidently unavailable for physiological processes (C.G. Woodbridge).

INTERVEINAL CHLOROSIS (manganese deficiency) was seen for the first time in the Okanagan Valley, B.C. It was widespread but caused slight damage. The response to sprays containing manganese was marked. Fruit size and total crop did not seem to be affected (C.G. Woodbridge).

FRUIT MALFORMATION (low temperature injury). Flattened fruits occurred in a few orchards in N.B. as a result of low temperatures during bloom (J.L. Howatt).

LEAF SCORCH (?magnesium deficiency) has been seen for several years in the Okanagan Valley, B.C. It is extensive in some orchards, and is most severe in heavy crop years. Up to 90% defoliation may occur in August or early September; the fruit then fails to size and the crop may be a total loss. Delicious, Jonathon, McIntosh, and Newton are most affected (C.G. Woodbridge).

LENTICEL SPOTTING (physiological). Several specimens of Talman Sweet were received in December, 1949, from Chatham and Guelph, Ont., with red spotting about the lenticels, believed due to conditions in common storage (G.C. Chamberlain). In late February, 1950, affected, over-mature McIntosh were received from cold storage at Belleville. No micro-organisms were associated (H.N. Racicot).

JONATHON SPOT (physiological). Specimens of affected Jonathon, shipped from Leamington, Ont., to Quebec City were sent in for diagnosis; symptoms were typical and no micro-organism was associated (H.N. Racicot).

LITTLE LEAF and ROSETTE (zinc deficiency) has been seen in the Okanagan Valley, B.C., for several years. Response to zinc sprays is often slow, and dormant applications of 20 lb. zinc sulphate in 100 gal. water for 3 years may be needed to cure the disorder. The common symptoms on apple are small leaves on two- and three-year-old wood, rosette due to shortened internodes on one-year-old wood, and interveinal necrosis. The trouble has also been seen on stone fruits (C.G. Woodbridge).

SPRAY INJURY. The use of Bordeaux mixture, in cool, humid weather, for the pre-blossom and first cover sprays caused slight to moderate russetting in many orchards in N.B., but high colour at picking time tended to obscure the blemish (J.L. Howatt).

SUN SCALD was quite common on Newton in many parts of the Okanagan Valley, B.C. (C.G. Woodbridge). Affected Duchess fruit were seen in an orchard in Grantham Twp., Lincoln Co., Ont. (G.C. Chamberlain).

PEAR

FIRE BLIGHT (Erwinia amylovora). In the Creston Valley, B.C., the provincial Department of Agriculture made thorough inspections and enforced winter cutting where possible. A dry blossom-period further aided control. In some areas incidence was much below that of 1949. However, in the main block of orchards, where several growers managed to evade the control measures, blight was as severe as in 1949 although it started late. Several small blocks and many individual trees have been removed, and many more will be cut out this winter (M.F. Welsh). Specimens were received from Sarnia and Oakville, Ont. (E.H. Garrard). A scattered infection was found in 3 small plantings of Bartlett in Grantham Twp., Lincoln Co., Ont. Infection was mainly in twigs, but had passed down some spurs into limbs (G.C. Chamberlain).

SCAB (Venturia pirina) was moderate on leaves and fruit of Flemish Beauty in the laboratory orchard, St. Catharines, Ont., but less severe than usual (G.C. Chamberlain). Infection was 0.5% on Clapp's Favourite at Greenwich, N.S., with lesions on the under sides of the leaves and over $\frac{1}{4}$ in. diam. on fruit. Infection was also 0.5% on Flemish Beauty at the Station, Kentville (C.L. Lockhart).

STONY PIT (virus). Fruit of one tree of Clapp's Favourite in Pictou Co., N.S., was a complete loss. Specimens received were apparently infected with this disease (K.A. Harrison).

BITTER PIT (?physiological). Fruits of Bartlett brought in from a home garden at Vancouver, B.C., were normal on the outside but showed internal dead tissue very similar to that of bitter pit in apple (I.C. MacSwan). A form of bitter pit has been seen in the Okanagan Valley for many years. In 1950 it increased in severity, 0 to 70% of the fruit of d'Anjou being affected. The symptoms are similar to those in apple and the same correlation between fruit size and occurrence has been found. D'Anjou is most severely affected, but the trouble occurs in other varieties (C.G. Woodbridge).

BLACK END (cause unknown) affected 0 to 100% of the fruit of Bartlett in the Okanagan Valley, B.C. The degree of injury varies from year to year, but once a tree has become affected it seldom produces a perfectly sound crop. The trouble is suspected to be due to incompatibility of root and scion (C.G. Woodbridge).

QUINCE

LEAF BLIGHT (Fabraea maculata). Infection was 100% in a short row of Quince A budding stock at Aldergrove, B.C. (H.N.W. Toms).

B. STONE FRUITS

APRICOT

CORYNEUM BLIGHT (Clasterosporium carpophilum) caused moderate damage in unsprayed orchards in the Kootenays, B.C., but the number of commercial plantings not receiving sprays is now very low (M.F. Welsh).

WILT (Verticillium albo-atrum) affected 10% of Moorpark and Perfection growing in low-lying muck soil near Okanagan L. at Summerland, B.C. The pathogen was isolated (G.E. Woolliams).

CHERRY

BLACK KNOT (Dibotryon morbosum). Affected specimens of May Day Tree, Prunus padus var. commutata, were brought in from E. Aylmer, Que. (H.N. Racicot).

SHOT HOLE (Higginsia hiemalis) was seen on all varieties, especially Black Republican, in the West Kootenays, B.C. Infection was moderate, but started late (M.F. Welsh). Shot hole was of little importance in the Niagara Peninsula, Ont. A moderate infection with some defoliation was seen in one orchard of Bing sweet cherry (G.C. Chamberlain).

POWDERY MILDEW (Podosphaera oxyacanthae) is rarely seen on cherry in the Okanagan Valley, B.C., but it was common in 1950 on nursery stock and on succulent shoots on winter-injured trees. In the Kootenays mildew is always present, but generally causes little damage. This year, with many winter-injured trees producing succulent growth it caused considerable injury (M.F. Welsh). It was common on vigorous young trees of Montmorency in Grantham Twp., Lincoln Co., Ont. (G.C. Chamberlain).

BLOSSOM BLIGHT and BROWN ROT (Sclerotinia fructicola and S. laxa). S. fructicola caused almost complete loss of crop from 25 trees of Bing and Lambert at Hatzic, B.C. Heavy rains before harvest and close spacing with consequent poor air drainage contributed (I.C. MacSwan). All varieties were affected by S. fructicola and S. laxa, mainly as brown rot, in the Kootenays; but as most damage was in the little cherry areas the monetary loss was minor (M.F. Welsh). Blossom blight due to S. fructicola was serious and widespread in the Niagara Peninsula, Ont., owing to several days with heavy fog during bloom. Up to 90% of bloom was destroyed (G.C. Chamberlain). S. fructicola caused heavy twig and blossom blight on a single Hansen's bush cherry, Prunus besseyi, at West Hill, York Co., Ont. (H.N. Racicot). Brown rot caused considerable loss on the trees and in storage at the Station, Kentville, N.S. (C.O. Gourley).

WITCHES' BROOM (Taphrina cerasi) was severe on a few trees in a garden at Brentwood, B.C. (W. Jones).

GREEN-RING YELLOWS (virus). Of 5362 trees in the sour cherry orchards under survey in the Niagara Peninsula, Ont., 13 (Montmorency and Early Richmond) were infected. Several trees are under observation in other orchards. A newly

observed symptom, associated with this disease but not with the commoner cherry yellows, was the presence of fruits that ripened unevenly, were bumpy, showed internal (mainly vascular) browning, and hung on the trees until September. A somewhat similar symptom was also seen in widely separated orchards on two trees that showed no foliage symptoms of green ring yellows. The possibility that it may be caused by viruses other than that of green-ring yellows is being investigated (R.S. Willison).

LITTLE CHERRY (virus). The presence of the virus in wild Prunus emarginata var. mollis in the Kootenays, B.C., appears to be fairly conclusively demonstrated. The new commercial variety Van appears to be a symptomless carrier of the virus (M.F. Welsh).

MILD RUGOSE MOSAIC (virus). Three trees in one sweet cherry orchard in Lincoln Co., Ont., showed symptoms suggestive of this disease (R.S. Willison).

MOTTLE LEAF (virus). A single affected tree of Bing sweet cherry was found at Erickson, in the Creston Valley, B.C. The tree was removed. This is the first record of the disease in the Creston Valley, although it has been known in the West Kootenay for 20 years (M.F. Welsh).

NECROTIC RING SPOT (virus). In the 5362 sour cherry trees surveyed in the Niagara Peninsula, Ont., only two cases of severe shock were seen, suggesting that the disease is reaching saturation in these orchards. There were 15 cases of mild shock, including some that repeated; a recurrent form of this disease is reported from Wisconsin and Pennsylvania. Etching was seen on 53 trees and probably occurred on others (R.S. Willison).

RING SPOT (virus) was seen on Deacon, Napoleon, and Schrecken Bigarreau, and was suspected on Lambert in a survey of the Station orchard, Kentville, N.S. (C.O. Gourley).

SMALL BITTER CHERRY (virus). Symptom expression was very mild this year in the southern Okanagan Valley, B.C., even in trees that had been infected for several years (T.B. Lott).

TATTER LEAF (virus) was seen in 24 of 26 orchards of sweet cherry surveyed in the Niagara Peninsula, Ont. Infection averaged 7.6% definite and 3.6% suspected, and ranged from 0 to 34%. This disease generally shows annually recurrent symptoms, but in some trees symptoms may appear in one year and not in another. The explanation of symptom expression is obscure. More than one virus may be involved. In a single case a Montmorency sour cherry inoculated with buds from sweet cherry with tatter leaf developed symptoms of green-ring yellows, but this is not the usual reaction (R.S. Willison).

YELLOWS (virus) infection varied from 2.5 to 74% in the 26 sour cherry orchards surveyed in the Niagara Peninsula, Ont. Of the 5362 trees 20.4% showed definite and 8.0% slight symptoms; 7.2% (25.6% of those affected) showed symptoms for the first time. Many trees show symptoms every year, but others show them erratically. The variation is suspected to be due to several strains of the cherry yellows virus being involved, and possibly to some other viruses causing similar symptoms. Symptom expression was delayed in 1950. It is believed that cool weather during leaf development, followed by hot weather in June, favours symptom expression; whereas hot weather immediately after bud break or cool weather in June tend to reduce severity of symptoms (R.S. Willison). Yellows was found in Dyehouse, Empress Eugenie, English Morello, Large Montmorency, Montmorency and Suda Hardy sour cherries in the Station orchard, Kentville, N.S., and was suspected in Noble, Orel.No. 24, and Windsor (C.O. Gourley).

CRINKLE (bud sport) and PSEUDO-CRINKLE (cause uncertain) ranged from 0 to 22.8%, av. 5.4%, in the 2806 trees of the surveyed sweet cherry orchards in the Niagara Peninsula, Ont. True crinkle is seen mostly in Black Tartarian, Bing, and Hedelfingen. In addition a condition resembling it and tentatively called pseudo-crinkle has recently been recognised. It may also be associated with low productivity and available information suggests that it may spread from tree to tree. It is widespread on various varieties and is sometimes difficult to diagnose (R.S. Willison).

GUMMOSIS and DIE-BACK (cause unknown) occurred on trees of Black Tartarian sweet cherry in Grantham Twp., Lincoln Co., Ont. The lesions suggest parasitic attack, but isolations have not yielded any probable pathogen consistently and most platings have been sterile. The trees are vigorous but for the dead branches and show little or no crown damage although some nearby trees show crown and possibly root injury (R.S. Willison).

MOTTLE (?virus) of sweet cherry showed on 33.2% of the 2806 trees in the surveyed orchards in the Niagara Peninsula, Ont. The condition is distinct from the mottle-leaf of the Pacific coast. As far as possible physiological mottles were discounted in making the survey. The mottle was associated in 5% of the trees with ring patterns and in another 5% with line patterns (R.S. Willison).

RASP LEAF (cause unknown). Five affected trees of Montmorency were seen in the sour cherry orchard survey in the Niagara Peninsula, Ont. Cock's comb enations, similar to those of sweet cherry rasp leaf occurred on the under leaf surface. The trees have been indexed to see if a virus is involved (R.S. Willison).

?RUSTY MOTTLE (cause unknown). Five of a block of 33 sweet cherry trees in Niagara Twp., Lincoln Co., Ont., have shown a June drop of yellow leaves yearly since first seen in 1948, with symptoms varying in intensity but resembling those described for rusty mottle (R.S. Willison).

PEACH

SCAB (Cladosporium carpophilum) was moderately heavy on the fruit of young Early Red at Grand Pre, N.S., that had received only a dormant spray (C.O. Gourley).

CORYNEUM BLIGHT (Clasterosporium carpophilum) was general on 31 Aug. on Fisher, Pacific Gold, Rochester, and Vedette at Chilliwack, B.C., and caused severe fruit spotting (I.C. MacSwan).

DIE-BACK (Cytospora leucostoma) caused considerable damage to young peaches at the Station, Kentville, N.S. (C.O. Gourley).

BROWN ROT (Sclerotinia fructicola) varied from light to moderate on Fisher, Pacific Gold, Rochester, and Vedette at Chilliwack, B.C. No varietal differences could be seen. No brown rot was seen until the onset of warm, wet weather on 25 Aug. (I.C. MacSwan). Blossom blight was very severe in varieties in bloom at the critical period in the Niagara Peninsula, Ont., in orchards bordering L. Ontario where persistent fogs occurred for several days in May. Brown rot was serious during the harvest of mid-season varieties, owing to nearly continuous rain 26 Aug. to 1 Sept., and losses were heavy, especially near the lake where the fruit matured rapidly. Dealers reported heavy losses in shipment. There was much less rot in the later varieties (G.C. Chamberlain, R.S. Willison). After a 24-hour rain, over-wintered mummies and blighted twigs of Rochester peaches and Lombard plums were placed in a moist chamber in late May; a further 48-60 hours were needed to produce spores on the fruit. More sporodochia formed on plum than on peach mummies. Sporulation occurred on only 2/10 twigs, usually at pedicels, and not on the larger ones. In spray tests in the laboratory orchard, St. Catharines, the organic sprays, glyoxalidine, phenyl mercury acetate, and Phygon, were about equal in performance to sulphur, but treatments and controls varied too much to give much indication of control value. Sulphur cover sprays, with no pre-pick spray, conspicuously reduced loss from brown rot in Rochester, but infection was nevertheless heavy because this variety ripened in wet weather. Dryer harvesting weather for Elberta allowed much less brown rot to develop, and spray tests did not indicate any conspicuous reduction in infection (R.S. Willison).

LEAF CURL (Taphrina deformans) caused heavy defoliation of Vedette at Chilliwack, B.C. Infection was general in Fisher, Pacific Gold and Rochester, but defoliation was light (I.C. MacSwan). Infection of all varieties was light in the Creston Valley and moderate in the West Kootenay (M.F. Welsh). Infection was light at Port Williams and Wolfville, N.S. (C.O. Gourley). Several reports of from a trace to 25%, mostly on unsprayed trees, were received from Kings Co. (J.F. Hockey).

WILT (Verticillium sp.). Four instances of typical wilt were seen in 2- and 3-year-old vigorous trees of Golden Jubilee in Lincoln Co., Ont. In each case tomatoes had preceded the peaches or bean used as an intercrop (G.C. Chamberlain).

WESTERN X DISEASE (virus). Symptom expression was very mild in the southern Okanagan Valley, B.C., even in trees previously known to be infected (T.B. Lott).

PLUM

BLACK KNOT (Dibotryon morbosum). Infection was slight on Mallard at the Station, Saanichton, B.C., and on a damson in a garden at Sidney (W. Jones). Infection was general in plantings in the lower mainland, and was heavier on plums than on Italian prune (I.C. MacSwan). Black knot was abundant in 5 wild plum trees in a vacant lot at St. Catharines, Ont. Every branch bore at least one knot (G.C. Chamberlain). An orchard at Chateauguay, Que., was so heavily infected as to be absolutely worthless (F. Godbout). A specimen was received from St. Romuald, Levis Co. (H.N. Racicot).

SHOT HOLE (Higginsia hiemalis) was severe in a specimen from St. Sauveur des Montagnes, Terrebonne Co., Que. (H.N. Racicot).

BROWN ROT (Sclerotinia fructicola) was common on several varieties at the Station, Saanichton, B.C. (W. Jones). A specimen was received from Mair, Sask. (T.C. Vanterpool). Brown rot was quite common in the Niagara Peninsula, Ont., on Grand Duke, Monarch, and Yellow Egg (G.C. Chamberlain). It was heavy on all varieties at the Station, Kentville, N.S., causing considerable loss on the trees and in storage (C.O. Gourley).

PLUM POCKET (Taphrina communis). All the fruit on one tree in a garden at North Vancouver, B.C., was affected (I.C. MacSwan). Specimens were received from Chelan, Sask., with the statement that this was the third year of occurrence (T.C. Vanterpool). Infection was a trace at Port Williams, N.S., on a young tree of Burbank that had received a very late dormant spray of Bordeaux mixture (C.O. Gourley).

RUST (Tranzchelia pruni-spinosae) was common in a neglected orchard at Mill Bay, B.C. (W. Jones).

WILT (Verticillium sp.). Thirty per cent of a block of Italian Prune in Grantham Twp., Lincoln Co., Ont., were dead or dying on 25 Aug. (R.S. Willison).

BACTERIAL BLIGHT (Xanthomonas pruni). At the Station, Kentville, N.S., the shot-hole phase was heavier, in Japanese varieties, on trees with many cankers than on those with few or none (C.O. Gourley).

PRUNE DWARF (virus). One tree of Italian prune in an orchard of several hundred in Lincoln Co., Ont., was infected. The foliage was seriously dwarfed and the crop very light (G.C. Chamberlain).

SHIRO LINE-PATTERN MOSAIC (virus) appeared in July in Lincoln Co., Ont., on Shiro trees top-worked to Red June (G.C. Chamberlain). A line-pattern mosaic was found only in Mammoth Japanese plum of the 75 varieties at the Station, Kentville, N.S. (C.O. Gourley).

CHLOROSIS (lime-induced) was severe on plum at Gimli, Man., and on Greengage plum and Opata plum x cherry hybrid at Rivercrest (W.L. Gordon).

SHRIVELLING (cause unknown). Shrivelling of the fruit of Italian prune at the stem end was common in many orchards in the Niagara Peninsula, Ont. The cause is unknown (G.C. Chamberlain).

SPRAY INJURY. Some plum and prune orchards in the Niagara Peninsula, Ont., showed considerable defoliation attributed to copper and arsenical injury. Japanese plums in some instances suffered nearly complete defoliation. Plums are subject to injury from copper fungicides used in summer with an oil emulsion for mite control (G.C. Chamberlain).

C. RIBES FRUITS

CURRANT

WHITE PINE BLISTER RUST (*Cronartium ribicola*). At the Station, Saanichton, B.C., infection was slight on Boskoop and Buddenburg. No rust occurred on adjacent Coronet and Crusader. Boskoop is being widely grown for its rust resistant quality (W. Jones). Infection was general and moderately heavy on Boskoop in Creston Valley, but appeared too late to cause much defoliation (M.F. Welsh). Rust was general on Boskoop and Black Giant in nurseries at Fenwick, Port Burwell, Hamilton, Gilford and Stayner, Ont., and it caused defoliation of bushes at Goderich (G.C. Chamberlain). Rusted specimens of black currant were received from St. Hilaire, Que. (H.N. Racicot). Rust caused complete defoliation of black currants at Port Williams, N.S. Infection was moderate, but damage slight, on Black Victorian, Climax, Clipper, Magnus and Saunders at the Station, Kentville (C.O. Gourley). Infection was 50% on black currant at Southport, P.E.I. (J.E. Campbell). A new rustless black currant, O-396, which is to be named Consort, was released in 1949 by the Division of Horticulture for trial; it can set fruit with its own pollen and without the help of insects. It has the further advantage that it can serve as a pollinator for Crusader and Coronet, the rust-immune varieties released previously.

CANKER (Nectria cinnabarina) caused considerable die-back in a small planting of red currants in Grantham Twp., Lincoln Co., Ont. (G.C. Chamberlain). Infection was light in a small plot of black currants at Port Williams, N.S. (C.O. Gourley).

POWDERY MILDEW (Sphaerotheca mors-uvae). Infection was 50% in a small row of red currants at Point Grey, Vancouver, B.C. It was heavy on Coronet (O-393) in a commercial nursery at Aberdeen (H.N.W. Toms). Damage was severe on specimens of Crusader from Barrie, Ont. (H.N. Racicot). By mid August about half the new shoots on two varieties of black currant in a garden at Ottawa were heavily blighted and perithecia were abundant (I.L. Conners). Infection was heavy and damage moderate on Coronet and Crusader at the Station, Kentville, N.S. (C.O. Gourley).

GOOSEBERRY

WHITE PINE BLISTER RUST (Cronartium ribicola) was heavy on O-273 and O-274 at the Station, Kentville, N.S. (C.O. Gourley).

SEPTORIA LEAF SPOT (Mycosphaerella grossulariae) was light on O-275 at the Station, Kentville, N.S. (C.O. Gourley).

RUST (Puccinia pringsheimiana) was light and damage nil on Captivator at the Station, Kentville, N.S. (C.O. Gourley).

POWDERY MILDEW (Sphaerotheca mors-uvae) was moderately heavy, but caused slight damage, on Young and Fredonia at the Station, Kentville, N.S. (C.O. Gourley).

D. RUBUS FRUITS

BLACKBERRY

CANE GALL (Agrobacterium rubi) is reported from B.C. on Evergreen by E.K. Vaughan et al. U.S.D.A. P.D.R. 35:34-37. 1951.

ORANGE RUST (Gymnoconia peckiana) was heavy on wild blackberries at the Station, Kentville, N.S. (C.O. Gourley).

BOYSENBERRY

CANE GALL (Agrobacterium rubi) was general on canes in a garden at Nanaimo, B.C. (W. Jones).

MOSAIC (virus) is reported as severe, with dwarfing, at Pitt Meadows, B.C., by E.K. Vaughan et al. U.S.D.A. P.D.R. 35:34-37. 1951.

FROST INJURY. Loss of canes in March, 1950, at Duncan, B.C., was about 80% in one planting. Damage to other Rubus spp., including raspberry, was minor (W. Jones).

LOGANBERRY

CANE GALL (Agrobacterium rubi) caused considerable damage in a planting at Keating, B.C. (C. Coleman).

RASPBERRY

CROWN GALL (Agrobacterium tumefaciens). Infection was 60% and loss 40% in a mixed planting at Lennoxville, Que. (H. Genereux). Infection was 75% and damage 50% in the varieties under test at Ste. Anne de la Pocatiere; Viking showed some resistance (A. Payette). More specimens were received from Kings Co., N.S., than for many years. The disease is apparently quite common, but is not often seen in fruiting plantations (K.A. Harrison). Crown gall was seen at Kentville and specimens were received from Truro and Brooklyn (J.F. Hockey). Infection was heavy and damage severe in Cuthbert and Viking in Queens Co., P.E.I. (R.R. Hurst).

CANE BLIGHT (Botrytis cinerea). Infection was trace to 10% in Gatineau, Rideau, Trent, and Washington at Kentville, N.S., and in Madawaska, Trent, and Viking at Truro (J.F. Hockey).

SPUR BLIGHT (Didymella applanata) was light on specimens from Mindemoya, Manitoulin I., Ont., and on specimens of Taylor from Guelph. It was severe in material of Madawaska from Stayner. It was moderate in Cuthbert from Campbellford and unidentified plants from Manotick (H.N. Racicot). In the Leamington area spur blight was very severe and, combined with winter injury, caused the loss of many acres. In the London area it occurred frequently, but caused little damage. It was abundant in the Niagara Peninsula (A.T. Bolton). Infection was 30% in a weedy patch of Madawaska at Sparta. It was also found at Goderich, mainly on the Ottawa varieties; heavy growth and poor air drainage contributed to unusually heavy infection of Madawaska, Muskoka, Trent, and Van Dyke (G.C. Chamberlain). Traces were seen by Mr. J. Ringuet on Newburg in a nursery at St. Lazare, Vaudreuil Co., Que.,

and by Mr. D. Leblond in nurseries at St. Alphonse de Caplan, Bonaventure Co., and Trois Pistoles, Riviere du Loup Co. (L. Cinq-Mars). Infection was trace to 2% of canes of Newburg and Viking at the Station, Kentville, N.S. Small amounts were seen in some commercial plantings and it was heavy in specimens from Halifax Co. (K.A. Harrison). Damage to Viking in Queens Co., P.E.I., was slight in early Aug., but there was a sharp increase late in the season (R.R. Hurst).

ANTHRACNOSE (Elsinoe veneta) is reported on Washington and Lloyd George at Huntingdon, B.C., by E.K. Vaughan et al. U.S.D.A. P.D.R. 35:34-37 1951 (D.B.O.S.). It was moderate on canes and leaves from Mindemoya, Manitoulin I., Ont., and severe on Taylor from Guelph (H.N. Racicot). Anthracnose caused some damage to new canes in the Leamington area. It was the principal disease in the London area, killing considerable numbers of canes in some plantings. It was not serious in the Niagara Peninsula (A.T. Bolton). A moderate infection was seen on Morrison at Port Burwell. It was seen in many plantings of red raspberries in the Niagara Peninsula but it was less important than usual (G.C. Chamberlain). Infection was 2% in a Newburg nursery planting at St. Lazare, Vaudreuil Co., Que. (J. Ringuet). Anthracnose is causing increasing damage near Quebec City, notably in the northern parts of Levis and Bellechasse Co. Dormant lime sulphur has given good control locally for several years (O. Caron). Infection was seen on all of 1000 canes of Taylor newly planted at Port Williams, N.S. (K.A. Harrison). In Queens Co., P.E.I., infection was Viking 11%, Lloyd George 17%, Madawaska 27%, and Trent 63%; damage was moderate to heavy (R.R. Hurst).

CANE BLIGHT (Leptosphaeria coniothyrium). Two specimens of Viking were brought in from Cambridge, N.S., on 21 Aug. The canes were dying after harvest (K.A. Harrison).

SEPTORIA LEAF SPOT (Mycosphaerella rubi) was light on leaves sent in from Mindemoya, Manitoulin I., Ont. (H.N. Racicot). Infection was general in several plantings of Viking at Penetanguishene (G.C. Chamberlain).

YELLOW RUST (Phragmidium rubi-idaei) was common on Washington at Duncan and Nanaimo, B.C., but caused slight damage (W. Jones).

LATE YELLOW RUST (Pucciniastrum americanum) was found in Viking at Goderich and Penetanguishene, Ont., and caused considerable leaf fall at the latter locality. It was common in a planting of Cuthbert at Port Burwell (G.C. Chamberlain). A light infection was seen in a planting at Brighton (D.S. MacLachlan). Infection was general in red raspberry varieties in Kings Co., N.S. (J.F. Hockey). It was light on Latham and heavy on Viking in Queens Co., P.E.I., destroying 85% of the crop of the latter (R.R. Hurst).

POWDERY MILDEW (Sphaerotheca humuli) was very common in Latham plantings throughout central Ont. and the Niagara Peninsula. At Campbellford a 1½ acre planting was severely stunted and had spindly cane tips and mottled foliage (G.C. Chamberlain).

VERTICILLIUM WILT (V. albo-atrum). Specimens were received from Prince Albert, Sask., with moderate damage reported (R.J. Ledingham). Wilted cane tips, perhaps affected by this disease, were sent in from Creelman (T.C. Vanterpool). Scattered infections, av. 3%, were seen in young Viking plantations in the Niagara Peninsula, Ont. (G.C. Chamberlain).

LEAF CURL (virus). Badly stunted plants of Taylor and Cuthbert were found at Port Stanley, Sparta and St. Catharines, Ont. It was also found in Chief at Port Stanley (G.C. Chamberlain). Several infected plants of Taylor and Viking were found in various plantations in Kings Co., N.S. (K.A. Harrison).

MOSAIC (virus) was reported to be moderately severe on Latham at Pitt Meadows and Lulu Island, B.C., Newburg at Langley, Taylor at Mission, and New Munger black raspberry at Vancouver, by E.K. Vaughan et al., U.S.D.A. P.D.R. 35:34-37. 1951 (D.B.O.S.). Infection by green mottle mosaic was 60% in a planting of Starlight at Kenwood, Ont. Infections of 1-3% were found in Chief, Latham, and Viking grown for certification (G.C. Chamberlain). Trace to 2% infections were seen in several nursery plantings of Newburg and Viking in s.w. Que. (L. Cinq-Mars). Infection was 21% in a Lloyd George planting in Queens Co., P.E.I. Mosaic if often found to be the explanation of unthrifty plantations in the province (R.R. Hurst).

YELLOW MOSAIC (virus). Several conspicuous cases of this disease were found in Taylor entered for certification at Penetanguishene, Gilford, and London, Ont. Infectior was 0.5-1.0% and affected plants were seriously stunted (G.C. Chamberlain).

STUNTING (?virus). In 1949 a grower at Summerland, B.C., noticed a few canes in his planting of Lloyd George with stunting and severe leaf distortion. In 1950 the disease spread throughout the patch and was found in two other local plantings. It is under study at the Vancouver Laboratory (M.F. Welsh).

CHLOROSIS (lime-induced iron deficiency) was seen at the Station, Scott, Sask., and in several gardens at Saskatoon. Injury appeared to be slight (R.J. Ledingham). Interveinal chlorosis, probably due to iron deficiency was seen at Saskatoon (T.C. Vanterpool). In a planting of Marcy at Belleville, Ont., there was complete bleaching of apical leaves and interveinal chlorosis of lower ones on fruiting canes on 30 June, but new growth was still normal (K.M. Graham).

ROOT ROT (cause unknown) at Burnaby, B.C., killed 10-15% of Lloyd George in 3 rows of 6-year-old plants and of 3 rows planted from them in 1949 (I.C. MacSwan).

WINTER INJURY caused considerable losses in the Leamington and Niagara districts, Ont. (A.T. Bolton). Light snow cover and strong winds contributed to winter injury in P.E.I. The loss was 11% in one plantation of Viking in Queens Co. (R.R. Hurst).

E. OTHER FRUITS

BLUEBERRY

CANKER (Godronia cassandrae) was general in a 4-acre planting of 4-year-old seedlings on Lulu Island, B.C. (I.C. MacSwan). Specimens were received from Vancouver with the statement that many shoots were affected early in spring and some of the older wood was dying in June (H.N. Racicot).

LEAF RUST (Thekopsora vacciniorum) was quite general at the blueberry substation, N.B., in early Sept. Slight defoliation had started (J.F. Hockey).

WINTER INJURY caused widespread die-back in plantings on Lulu Island, B.C., up to 50% of twigs and 30% of branches being killed. The fast-growing varieties Jersey and Dixie suffered much more than the slow-growing Atlantic and Pemberton (I.C. MacSwan).

GRAPE

DEAD ARM (Fusicoccum viticola) was quite common in Concord vineyards in the Niagara Peninsula, Ont., up to 30% of the vines being affected in some rows. Affected vines lose fruiting wood and may be killed outright or seriously weakened. The disease was also seen on Agawam, Niagara, President, and Seneca (G.C. Chamberlain).

DOWNY MILDEW (Plasmopara viticola). A few fruit clusters were destroyed in an unsprayed planting of Fredonia in Lincoln Co., Ont. (G.C. Chamberlain). A 25% premature fruit drop of American varieties at Rougemont, Que., was tentatively ascribed to downy mildew, but no leaf infection was seen (L. Cinq-Mars).

POWDERY MILDEW (Uncinula necator) developed late in the season on Concord in Lincoln Co., Ont., following very wet weather in late Aug. and early Sept. (G.C. Chamberlain).

CHLOROSIS, perhaps due to iron deficiency, was pronounced on Worden and Concord throughout the Niagara Peninsula, Ont. Affected vines later became more normal in colour, but were less vigorous than unaffected plants. Worden in a vineyard in Grantham Twp., Lincoln Co., had completely chlorotic foliage with marginal scorching and considerable stunting; adjacent Concord and Fredonia were unaffected (G.C. Chamberlain).

CHEMICAL INJURY. About 5 tons of grapes were greatly delayed in ripening in a vineyard in Welland Co., Ont., near a power-line right of way that was sprayed with 2,4-D. Vines showed the typical stunted and malformed apical leaves. Where injury was most severe the fruit never ripened (G.C. Chamberlain). Minor damage, mainly to European varieties and giving a mosaic effect on the leaves, resulted at Rougemont, Que., from the sprayer being previously used for 2,4-D (L. Cinq-Mars).

STRAWBERRY

LEAF BLIGHT (Dendrophoma obscurans). Some infection was seen on Premier in the Leamington, London, Waterford, Simcoe, and Niagara districts, Ont. Infection became heavier late in the season. It was also seen on Valentine in the Waterford, Simcoe, and Niagara districts; on British Sovereign in Leamington; on Senator Dunlap in Niagara; and on Mackenzie and Tupper in the London district (A.T. Bolton).

LEAF SCORCH (Diplocarpon earliana) was seen on Valentine in the Leamington, Waterford and Niagara districts, Ont.; on British Sovereign in Leamington; on Senator Dunlap in Niagara; and on Redwing in the London district; but none was recorded on Premier (A.T. Bolton). Leaf scorch infection was 5% in Redwing at Charlottetown, P.E.I., on 25 July. In August in the replicated variety plots infection was: none - Crimson Glow, Herman; trace - Dresden, Louise, Maytime, 57-35-C47, USDA 2312; light - Borden, Catskill, Culver, Fairfax, King, Massey, O-294; moderate - July Morn, Mackenzie, 37-52-C62; severe - Premier, Senator Dunlap (R.V. Clark).

LEAF SPOT (Mycosphaerella fragariae) was present, and often severe, on Valentine in the Leamington, Waterford, Simcoe, and Niagara districts, Ont. It was also recorded on British Sovereign, Senator Dunlap, Dorset, Louise, Tupper, and Redwing in various districts, but none was found on Premier. Infection was moderate at Leamington on an unnamed variety, which was, however free from leaf scorch and leaf blight (A.T. Bolton). Infection was 5-10% and damage very slight in several fields of Senator Dunlap near Montreal, Que. (L. Cinq-Mars). It was reported to be severe at Paquetteville, Gloucester Co., N.B. (J.E. Jacques). Leaf spot was light on most varieties in Kings and Annapolis Co., N.S., but it was heavy on unsprayed plantings of Louise (J.F. Hockey). In the replicated plots at Charlottetown, P.E.I., infection in August was: none - Borden, Catskill, Dresden, July Morn, Mackenzie, Premier; trace - Crimson Glow, Culver, Fairfax, Senator Dunlap; light - King, Maytime, Redwing, Tupper, Valentine, 57-35-C47, 37-52-C62, O-294, USDA 2312; moderate - Herman; severe - Louise (R.V. Clark).

RED STELE (Phytophthora fragariae) was severe in a runnerless everbearing variety in a garden at Sidney, B.C. Oospores were present in the roots. The plants had been grown from seed (W. Jones). A few infected plants of Premier and Senator Dunlap were found in wet areas at Berwick, N.S. (J.F. Hockey).

POWDERY MILDEW (Sphaerotheca humuli) was general on 1 Aug. in 3 acres of a 20 acre field of British Sovereign at Bradner, B.C. (J.C. MacSwan).

DECLINE (?virus). Many thousands of certified strawberry plants from coastal B.C. were planted in the Wynndel district, Creston Valley, in the spring of 1949. There was no obvious difference that year between the certified and locally grown plants; but in 1950 the certified plants were three times the size of the local ones and gave six pickings against two. The local plants appear to be infected by a serious, unidentified virus (W.R. Foster).

YELLOWS (virus). British Sovereign still shows no sign of degeneration in the field in B.C. although it has been proved susceptible by inocultion. Marshall is seriously affected (R.E. Fitzpatrick).

JUNE YELLOWS (genetic breakdown) was found in a few fields of Premier in the St. Catharines area, Ont. Growers claimed that it decreased the crop by 50% (A.T. Bolton). Plantings of Premier in the Berwick area, N.S., showed up to 75% of plants affected (J.F. Hockey).

ROOT ROT (cause unknown) was the most serious disease of strawberries in southern Ont. in 1950 (A.T. Bolton). Infection of a single long row of Premier in a garden near Ottawa, Ont., was about 50%. A few plants of various varieties were affected at L'Assomption, Que. (H.N. Racicot). Root rot affected all varieties at Ste. Anne de la Pocatiere, but damage was much less than in 1949 (A. Payette).

WINTER INJURY killed 40% of the plants in unprotected fields near Quebec City, Que., and caused further serious loss of crop from the remaining plants (O. Caron). A trace to 50% of plants of Senator Dunlap were affected at Charlottetown, P.E.I., with subsequent crown rot (R.R. Hurst). At Brackley Beach 5% of Senator Dunlap were affected, with death of roots, browning of crown, reddening of leaves and reduction of crop (J.E. Campbell).