III. DISEASES OF VEGETABLE AND FIELD CROPS

ASPARAGUS

RUST (Puccinia Asparagi). Infection was moderate on the smaller branches and light on the main stems of most plants examined in a 2-acre field of Martha Washington at Grand Forks, B.C., on 8 Oct.; growth of the plants was not noticeably retarded (G.E. Woolliams).

BEAN

GREY MOULD (Botrytis cinerea). Infection was general on a seed crop of Masterpiece at the Farm, Agassiz, B.C.; it caused discoloration and decay of the seed particularly of pods at the soil level (W. Jones).

ANTHRACNOSE (Colletotrichum Lindemuthianum). A survey for bean diseases was carried out this season, as in 1946, in Essex, Kent, Huron, Elgin and Middlesex Counties, where the more important bean-growing areas in southwestern Ont. are located. Although only a fraction of the 8,000 plantings of dry or field beans was examined, it is believed the observations give a good picture of the disease situation in these counties. In marked contrast to last year (P.D.S. 26:32), anthracnose was of rare occurrence in 1947 and only occasionally caused loss as, e.g., in a field of Michelite near St. Thomas, where pod infection was severe and eventually a high percentage of the seed bore visible lesions (A.A. Hildebrand, L.W. Koch and J.T. Slykhuis).

A slight infection was present on several varieties in the Laboratory plots, St. Catharines, Ont. (J.K. Richardson). The disease caused slight damage in a field at St. Martin, Que. (E. Lavallee). Anthracnose affected all the pods of a few rows of Blue Seeded Pencil Pod in a garden at Kentville, N.S.; no reports of losses were received from growers (K.A. Harrison). Very little anthracnose was present in P.E.I. in 1947; only two cases were brought to the Laboratory (R.R. Hurst).

HALO BLIGHT (Pseudomonas phaseolicola (Burkh.) Dowson). Diseased specimens were received from Grand Forks, B.C. D.C. Cook, Plant Products Division, stated in his covering letter: that the infection was slight 3 weeks earlier, but in the interval the grower had cultivated the crop while the plants were still wet after a rain and "now the infection is nearly 100%" (G.E. Woolliams). Damage was severe - on Long Green, Masterpiece and Red Pod and a trace to moderate on the other varieties at Beaverlodge, Alta. (J.D.G.). Halo blight was less severe than usual about Saskatoon, Sask., possibly on account of the dry season; only 1 - 2 severe cases were observed (R.J. Ledingham). The disease was common on snap beans at Winnipeg, Man. (W.A.F. Hagborg). Halo blight slightly affected several plantings in the St. Catharines district, Ont. (J.K. Richardson). A slight infection was recorded on 2 varieties at Ste. Anne de la Pocatiere, Que. (R.O. Lachance).

CHARCOAL ROT (Macrophomina Phaseoli) was observed affecting many plants in a stand of Corvette in the Laboratory plots, Harrow, Ont., in mid-September (A.A. Hildebrand et al.).

ROOT ROT (?Pythium spp.) was prevalent in early September in areas, in southwestern Ont., that had been flooded following heavy rains; Pythium was isolated from diseased specimens (A.A. Hildebrand et al.).

WILT (Sclerotinia sclerotiorum) was found affecting 1% of the Masterpiece plants at Agassiz, B.C.; sclerotia were present on the pods at soil level (W. Jones, I.C. MacSwan). Wilt was found in fields of Blue Lake at several places in the North Okanagan Valley; up to 50% of the plants were affected (G.E. Woolliams).

RUST (Uromyces appendiculatus). A severe infection was present in a 4-acre field of Kentucky Wonder pole beans at Agassiz, B.C. (W. Jones, I.C. MacSwan). Whereas rust was only of sporadic occurrence in previous years, the disease was widespread in southwestern Ont. in 1947 and severe damage was apparent in a number of severely infected fields of Michelite and Blue Pod (A.A. Hildebrand et al.). A light infection was seen in one planting and specimens were received from four others in Queens Co., P.E.I. (R.R. Hurst).

COMMON BLIGHT (Xanthomonas phaseoli). Diseased specimens were received from Hedley, B.C. (G.E. Woolliams). Some severely diseased plantings were seen about Saskatoon, Sask., but damage was probably less than usual on account of the dry season (R.J. Ledingham); diseased specimens were sent in from Marsden (T.C. Vanterpool). Common blight was found in several plantings at Winnipeg, Man. (W.A.F. Hagborg). Infection was heavy in a field at Lanoraie, Que. The disease also affected a patch 30 feet square in a 6-acre field at Ste. Theodosie (F. Godbout, E. Lavallee). Common blight was of no importance in P.E.I. this year (R.R. Hurst).

BACTERIAL BLIGHT (Common and Halo Blight), though widespread in its occurrence in southwestern Ont. in 1947, was far less destructive than last year. This year (a) infection was mostly confined to the foliage and (b) the stem-girdle or joint-rot phase of the disease was rare. In a field of Michelite near Chatham, pod infection was severe and a high percentage of the harvested seed showed greyish or faintly yellowish discolorations in varying degrees. The field was close to an area where both stem girdle and pod infection had been very severe last year (A.A. Hildebrand et al.).

CURLY TOP (Beta virus 1) affected about 5% of the plants in a field near Grand Forks, B.C. (G.E. Woolliams).

MOSAIC (virus). A trace of mosaic was seen in Stringless Refugee beans, in the University plots, Vancouver, B.C. (I.C. MacSwan). Mosaic was moderate on Strider and a trace on other varieties in the plots at Lethbridge, Alta. (J.D.G.). Only a trace of mosaic was observed in bean plantings in southwestern Ont. in the 1947 survey. However, following a prolonged period of dry weather, certain varieties of Dutch snap beans in

the plots at Harrow and Ridgetown developed symptoms resembling very closely those of common bean mosaic (A.A. Hildebrand et al.). Mosaic was present but it was of little economic importance in the many plantings examined in the St. Catharines district, Ont. (J.K. Richardson). A trace of mosaic (Phaseolus virus 1) was found on Kentucky Wonder (pole), Giant Stringless Green Pod and White Marrowfat in a garden at Fredericton, N.B. (D.J. MacLeod). Mosaic was observed in Yellow Eye (trace) and Ace (4% of plants) at Kentville, N.S. (K.A.Harrison). A heavy infection of mosaic occurred in one garden at Charlottetown, P.E.I. (R.R. Hurst).

YELLOW MOSAIC (Phaseolus virus 2). A well-defined yellow mosaic affected 4% of the plants of Flageolet in a garden at Fredericton, N.B. (D.J. MacLeod).

PRE-EMERGENCE KILLING. In my garden at Saskatoon, Sask., early-sown beans germinated so poorly, because of the extremely cold spring, that I dug up and reseeded the plot with seed from the original lot, which had been treated with spergon before the first seeding. Germination of the second seeding was 100% (T.C. Vanterpool).

SUN SCALD continues season after season to be the most noticeable and the most widespread of the various troubles on beans in southwestern Ont. It apparently does not cause any serious injury to the seed or reduction in yield (A.A. Hildebrand et al.).

AN UNDESCRIBED DISEASE OF BEANS. During June and July field beans of the varieties Michelite and Corvette in the Laboratory plots, Harrow, Ont., exhibited symptoms that appeared to be different from those of any disease described in beans. The first symptom noticed was the flaccid condition of a leaf or tendril on certain plants. Wilted leaves were not misshapen but were usually a darker green than the unaffected foliage. On some affected plants a leaf, otherwise normal, showed a more or less distinct yellow mottle. Even with an abundance of moisture in the soil, wilted leaves or tendrils soon dried up and died. Some of the plants showing wilted leaves were stunted and failed to set nearly as many pods as neighbouring healthy plants. Subsequently, the trouble was found in many commercial stands of the district and appeared to be more prevalent in Michelite than in other varieties.

After microscopic examination and attempts to isolate a pathogen had failed to reveal the presence of an organism in the affected tissues, the possibility that the disease was of virus origin was investigated. In a series of inoculation experiments in which the leaves of healthy bean seedlings were rubbed with juice obtained by macerating wilted leaves from affected plants, the yellow-mottle, but not the wilt, symptoms appeared in a high percentage of the inoculated seedlings. These results suggest that the trouble is, at least in part, of virus origin (A.A. Hildebrand et al.).

BEET

SCAB (Actinomyces scabies). A trace of scab was present on garden beets at Ste. Anne de la Pocatiere, Que. (R.O. Lachance) and Charlottetown, P.E.I. (R.R. Hurst).

LEAF SPOT (Cercospora beticola). Infection was general and damage slight in seed crops at Milner and Cobble Hill, B.C., in 1946 (W. Jones). The disease was present on all the plants and caused slight damage in 4 fields at St. Martin, Que. (E. Lavallee). A light infection was seen in one planting at Charlottetown, P.E.I. (R.R. Hurst).

DOWNY MILDEW (Peronospora Schachtii) was general in 2 gardens at Sidney, B.C. From field evidence, it appears that the disease is distributed with seed - most probably in diseased leaf fragments with the seed. Up to the present the disease has never been observed on sugar beets (W. Jones). A slight infection was observed at Point Grey, B.C. (I.C. MacSwan). Downy mildew was quite general and severe on Detroit Dark Red 16, but there was only a trace of infection observed on D.D.R. 6 at Grand Forks, B.C. (G.E. Woolliams).

LEAF SPOT and ROOT ROT (Phoma Betae). Considerable infection by P. Betae appeared to be present in roots forwarded to the Laboratory for diagnosis of downy mildew from Grand Forks, B.C. in Feb. 1946. The organism was isolated from blackened areas on the roots (W. Jones). A slight infection was general on the leaves, particularly the lower ones, at Agassiz and Milner, B.C. (I.C. MacSwan).

LEAF SPOT (Ramularia beticola) was general on the leaves on 18 March at the Station, Saanichton, B.C. (W. Jones). A slight infection was recorded on Flat Egyptian at Agassiz and Milner, B.C. (I.C. MacSwan).

RUST (Uromyces Betae). A slight infection occurred in a garden at the Station, Saanichton, B.C. (W. Jones).

BROWN HEART (boron deficiency) affected 10% of the stecklings in a field of Flat Egyptian at Keating, B.C., in 1946. The disease is quite common, but it can be reduced by application of boron (W. Jones). Brown heart affected 20% of the roots in a field of D.D.R. 16 at Grand Forks, B.C. (G.E. Woolliams).

BROCCOLI

BLACK LEAF SPOT (Alternaria oleracea) caused slight damage to the lower leaves of seed plants of Italian Green Sprouting at the Farm, Agassiz, B.C., in 1946 (W. Jones).

RING SPOT (Mycosphaerella brassicicola) was general on the foliage of over-wintered plants at North Saanich, B.C., in May 1946 (W. Jones).

CLUB ROOT (Plasmodiophora Brassicae). A slight infection was seen at Victoria, B.C. (W. Jones).

STERILITY (virus) was severe on 6 plants in a garden at Fredericton, N.B. The virus was transmitted by cleft grafting to Swede turnips, wild radish and broccoli. The virus is similar to the one causing sterility in Swede turnips (D.J. MacLeod).

CABBAGE

BLACK LEAF SPOT (Alternaria oleracea). A slight infection was present on seed plants at the University, Vancouver, B.C. (W. Jones) and on pods and leaves at Agassiz (I.C. MacSwan).

DOWNY MILDEW (Peronospora Brassicae). A slight infection was seen on Golden Acre at the Station, Saanichton, B.C., in 1946 (W. Jones).

CLUB ROOT (Plasmodiophora Brassicae). A severe infection occurred in a garden at Campbell River, B.C. (W. Jones). Club root was found in nearly every one of the 40 fields visited in the Montreal district, Que. Additional fields are being contaminated each year (E. Lavallee). Seedlings in a number of flats were a total loss at Kentville, N.S. (K.A. Harrison). A light infection was present in a planting of Danish Ballhead at Charlottetown, P.E.I.; it was also observed in 3 other local gardens (R.R. Hurst).

WIRE STEM (Rhizoctonia Solani). Although wire stem is less prevalent on cabbage than on cauliflower, the disease caused considerable trouble to growers in the Montreal district, Que. (E. Lavallee).

WILT (Sclerotinia sclerotiorum) affected a few plants in a garden on the Lower Mainland, B.C., in 1946 (W. Jones).

BLACK ROT (Xanthomonas campestris) was present in plots of cabbage and turnip grown side by side at the University, Winnipeg, Man.; the causal organism was isolated from discoloured tissues of the turnip root (W.A.F. Hagborg). Black rot affected 60% of the plants in a 10-acre field at St. Laurent, Que., with an estimated loss of 10% of the crop; the seed was home-grown (E. Lavallee).

FASCIATION (?Corynebacterium fasciens (Tilford) Dowson) affected 15% of the seed plants of Green Acre in a plot at the Station, Saanichton, B.C., in 1946 (W. Jones).

CARAWAY

YELLOWS (Callistephus virus 1) affected 10% of the plants in a field being grown for seed at Grand Forks, B.C. (G.E. Woolliams).

CARROT

LEAF BLIGHT (Alternaria Dauci). Infection was general and damage to the foliage was considerable at Agassiz, B.C., in 1946 (W. Jones). The disease was again observed at Agassiz in 1947 (I.C. MacSwan).

BLACK ROT (Alternaria radicina) was found on the occasional steckling of Chantenay and Nantes at Grand Forks, B.C., on 5 June. A very little infection was present on plants from treated seed examined 8 Oct. and it was confined to the petioles of the outer leaves. On the other hand when untreated seed was sown foliar infections occurred on 50% of the plants and some root rot was present developing largely where growth cracks had occurred (G.E. Woolliams).

LEAF BLIGHT (Cercospora Carotae) was observed occasionally about Guelph, Ont. (J.D. MacLachlan).

SOFT ROT (Erwinia carotovora). Damage was severe on all varieties in one test at the Station, Lethbridge, Alta. (J.D.G.).

ROOT KNOT (Heterodera marioni). All 10 fields examined averaging an acre each were infested at St. Janvier, Terrebonne Co., Que. Infection varied from a trace to moderate. The disease developed later than last year and consequently losses were slight. At Dorval, Jacques Cartier Co., 90% of the carrots were infected in 1/2 acre field; loss was 50-60% (R. Desmarteau). At St. Martin, Laval Co., a 3-acre field was found heavily infested; value of crop reduced 50%. A similar case was found at St. Vincent de Paul (E. Lavallee).

SCLEROTINIA ROT (S. sclerotiorum) was reported to have been prevalent on carrot roots from the Interior of B.C. after they were removed from storage and shipped to the Vancouver market, especially in shipments made after Christmas. In July infection was a trace in a field of stecklings, at Vernon, whereas the disease had caused a 50% loss in a seed crop at Armstrong (G.E. Woolliams).

BACTERIAL BLIGHT (Xanthomonas carotae). Infection varied from a trace to 75% of the seed plants in fields at Grand Forks, B.C. In the heavily-infected fields many of the umbels were partly or completely destroyed. Aphids were prevalent in the severely diseased fields and may have served in the spread of the disease. Later infection was a trace in a field intended for stecklings at Armstrong (G.E. Woolliams).

DWARF (virus). In a commercial field of Chantenay in York Co., N.B., 22% of the plants showed a distortion and dwarfing of the leaves. The petioles or petiolules were frequently twisted and bent so that the lower surface of the leaf or leaflets were uppermost. The lower and middles leaves showed an irregular chlorotic mottling which was later superseded by a chlorosis of the margins and finally a reddening of the marginal areas. The leaves so affected died prematurely. The petioles were generally quite brittle and frequently showed necrotic streaking. The roots were reduced in size and showed nodular growths. The disease

resembles yellows (q.v.) and was frequently found associated with it. Plants affected by both viruses were severely dwarfed and distorted. Dwarf was transmitted to healthy carrots by a species of aphid as yet not specifically identified, found on the infected carrots in the field (D.J. MacLeod).

YELLOWS (Callistephus virus 1). From a trace to 1% of the seed plants were found affected in fields at Grand Forks, B.C., on 5 June; these plants were from diseased roots that passed undetected and were not culled out at harvest time, 1946. Only a trace of yellows was present in the stecklings this year. The low infection in the crop is a marked improvement over former years and is due in part to the rigorous roguing of affected roots by growers at harvest in the past few years (G.E. Woolliams). Some yellows was observed at Edmonton, Alta. Yellows was also found by D.J. MacLeod in a tansy mustard at Calgary, Alta. (T.R. Davidson). Only traces of yellows were present at Indian Head in July. Slight damage occurred at Saskatoon, Sask., where late-season observations were made (R.J. Ledingham). About 25 carrot fields were examined in the Montreal district, Que., and yellows was found in nearly every one especially at the borders of the fields. Infection was generally light. In about 10 fields, which were oil-treated for weed control, the disease was practically absent (E. Lavallee). Yellows was common in carrots in York, Sunbury, Queens and Carleton Counties, N.B. Infection ranged from a trace to 12% in the 11 fields examined (D.J. MacLeod). Yellows infection varied from one to 10% (av. 4%) in the fields examined in Kings and Annapolis Counties, N.S. (J.F. Hockey). Infection varied from a trace to 50% of the plants in gardens in Queens Co., P.E.I. (R.R. Hurst).

CAULIFLOWER

BLACK LEAF SPOT (Alternaria oleracea). Infection was slight on the lower leaves of a 3/4 acre seed crop of Perfection Snowball at White Rock, B.C., in 1946 (W. Jones). A trace was present on cauliflower at Cloverdale, B.C. (I.C. MacSwan).

CURD ROT (Erwinia carotovora). A slight infection was seen at Elk Lake, B.C. (W. Jones).

DOWNY MILDEW (Peronospora Brassicae) caused considerable damage at Royal Oak, B.C., due to systemic infection of the seed plants (W. Jones).

CLUB ROOT (Plasmodiophora Brassicae) was severe on a few seed plants at Lulu Island and Elk Lake, Vancouver Island, B.C. (W. Jones). Severe infections of club root were found on both cabbage and cauliflower in the Chinese market gardens on muck soil in the Fraser River Delta. Infection was also slight to severe in home gardens and farms throughout the Delta region (I.C. MacSwan). In one 6-acre field at St. Bruno, Que., 80% of the plants were severely affected (R. Desmarteau). One or two plants were affected in a garden at Kentville, N.S. A very heavy infection occurred in this garden in 1940, but no crop of crucifers had been planted in the interval (K.A. Harrison). A trace of club root was observed in one garden in Queens Co., P.E.I. (R.R. Hurst).

WIRE STEM (Rhizoctonia Solani) was again prevalent, causing severe damage in plant beds in the Montreal district, Que. Because this disease occurs quite regularly each spring, growers of cauliflower, cabbage and early turnips grow seedlings greatly in excess of their planting requirements; even so, the acreage has frequently to be reduced due to the lack of transplants. Formaldehyde treatment is effective but not when manure is used in making the hot beds, which is frequently the case (E. Lavallee, F. Godbout).

WILT (Sclerotinia sclerotiorum) affected 10% of the plants in a seed crop at Elk Lake, B.C. (W. Jones). Diseased specimens were received from a planting near Windsor, Ont. (C.D. McKeen).

BLACK ROT (Xanthomonas campestris). Two one-acre plantings in Lincoln Co., Ont., showed severe leaf infection, apparently spread during cultivation. Damage was largely confined to the leaves but a few plants were destroyed prior to heading (J.K. Richardson). Black rot caused heavy losses in some fields in the Montreal district, Que. Two fields, one at St. Laurent and another at St. Paul L'Hermite, grown from seed from the same source were heavily infected and nearly a total loss. Rows of plants from seed of another source in each of these fields were much less affected. One 3-acre field (16,000 plants) also at St. Laurent was a total loss, estimated at $2,000-$3,000 by the grower. Other fields from the same seed source were stated to be severely infected. A 10-20% infection was found in a field at St. Martin and in another at St. Vincent de Paul (E. Lavallee, R. Desmarteau).

BROWN HEART (boron deficiency). A trace was found on cauliflower on the local market, Charlottetown, P.E.I. (R.R. Hurst).

WHIPTAIL (physiological). On account of whiptail 10% of the plants failed to head in a 2-acre planting at Waterville, N.S.; the loss would have been greater but many plants were discarded at the time the field was set (K.A. Harrison).

CELERY

EARLY BLIGHT (Cercospora Apii). A heavy infection was observed in a 2-acre planting at Lemmington, Ont.; damage was extensive (C.D. McKeen). Early blight appeared to be causing more damage than late blight in several plantings observed in Lincoln Co. and in some instances the damage was quite severe (J.K. Richardson). Infection was severe in one planting at St. Martin, Laval Co., Que. (E. Lavallee).

LATE BLIGHT (Septoria Apii-graveolentis) was common in truck gardens at Marpole, B.C., in 1946 (W. Jones). A light infection was found mostly on the lower leaves in a seed crop at Kelowna (G.E. Woolliams). Infection was heavy and the crop was a total loss in a field of about an acre planted by a new grower with diseased plants at St. Martin, Que.; no spraying was done. A loss of about 75% of the crop occurred in two other fields planted by inexperienced growers in the same district. Most celery growers in this

district control blight fairly well using the following programme: applying Bordeaux mixture 7 1/2 - 15 - 100 or copper-lime dust. (a) In beds: one application every week to 10 days starting when the plants are about 2" high. (b) In fields: one application every 10-15 days according to the growth and rainfall (E. Lavallee).

POTASH DEFICIENCY. Complaint was received that celery plants were severely stunted in numerous patches in a large field in Lincoln Co., Ont. The condition, due to low potash, was corrected by several applications of 0-12-10 fertilizer. A month later the plants had almost regained their normal size and vigour (J.K. Richardson).

CHIVES

RUST (Puccinia Porri). An excellent collection of this rust was made by Dr. H.T. Güssow on 15 June in his own garden, Victoria, B.C. Although this species was previously recorded in B.C. (P.D.S. 23:49), its identity had remained in doubt, only uredinia being present in the earlier collections. Dr. Güssow notes: "This rust kills the chive leaves every year at this time, but new growth comes from the bulbs and is sound for about a year". The rust has occurred sporadically in the eastern United States for some time, but it was after 1920 before it was known on the Pacific Coast. Freeman Weiss (U.S.D.A. Pl. Dis. Reptr. 31(1):33-37. 1947) reports it on garlic from Calif., on chives from Conn., N.Y., and Wash., and on onion from Conn., Nebr., and Calif. Aecia of this supposedly euautoecious rust have not been observed in North America (I.L. Conners).

CUCUMBER

GREY MOULD (Botrytis cinerea) caused moderate damage to a greenhouse crop at Mayne Island, B.C. (W. Jones). Grey mould attacked the nodes of cucumber stems in several greenhouses in Essex Co., Ont. Where the disease was not checked, the plants wilted and died. In one large greenhouse 30% of the crop was destroyed (C.D. McKeen).

SCAB (Cladosporium cucumerinum) caused slight damage to Perry's Special in greenhouses in Essex Co., Ont. (C.D. McKeen). Scab was present at the end of the season in many fields about St. Martin, Laval Co., Que. (E. Lavallee). Weather conditions were unfavourable for scab in N.B. throughout the growing season and little or no loss occurred this year (J.L. Howatt). Scab destroyed all the fruit in a garden plot of White Spine at Kentville, N.S., but no complaints were received from growers of field crops. Scab destroyed a crop in a greenhouse at Hantsport just as the plants were coming into bearing (K.A. Harrison). A trace was observed in a garden in Queens Co., P.E.I. (R.R. Hurst).

BACTERIAL WILT (Erwinia tracheiphila) caused the death of a few plants in a greenhouse at Cottam, Ont., in June (C.D. McKeen). The disease

destroyed a few plants in a 2-acre planting of Chicago Pickling heavily infested with cucumber beetle and tarnished plant bug at Millville, N.S. (K.A. Harrison).

POWDERY MILDEW (Erysiphe Cichoracearum) caused considerable damage in many greenhouses in Essex Co., Ont. Mildew also appeared late in the season on most outdoor plantings and rapidly destroyed the foliage and vines (C.D. McKeen).

WILT (Fusarium sp.) infection was moderate to severe in one plot in trials at Point Grey, B.C.; affected plants, usually one plant in 3 or 4 plants per hill, wilted and died (I.C. MacSwan). Wilt was affecting many plants in a greenhouse at Sidney on May 8. Isolations yielded a Fusarium, which was identified as F. oxysporum by W.L. Gordon. Its pathogenicity has not been tested (W. Jones). Wilt (?cause) was a serious disease in many commercial plantings at Winnipeg, Man., and vicinity. Losses were heavy from the end of July onwards. There was no evidence that Erwinia tracheiphila was involved (W.L. Gordon, W.A.F. Hagborg). Fusarium wilt was found in 2 greenhouses in the Leamington area, Ont.; all affected plants died just after harvesting began (C.D. McKeen).

WILT (Mycosphaerella citrullina). Several plants were attacked and died in a greenhouse at Ruthven, Ont.; the disease often appears as the crop approaches maturity (C.D. McKeen).

ANGULAR LEAF SPOT (Pseudomonas lachrymans). Damage was severe in a 15-acre field near Coaldale, Alta., and moderate in a greenhouse at Edmonton (J.D.G.). A heavy infection was found on the variety Minou at the Farm, Brandon, Man., in 1946. The causal organism was isolated, identified and its pathogenicity tested. The disease was also found at St. Adolphe in 1947 (W.L. Gordon, W.A.F. Hagborg). It affected several plants in a greenhouse at Leamington, Ont. (C.D. McKeen). The disease was severe in a plot at the Station, Fredericton, N.B., and caused moderate damage in scattered plantings in the cucumber area around Sheffield and Grand Lake (J.L. Howatt).

DAMPING OFF (Pythium sp.) was severe in most cucumber seed beds in Essex Co., Ont., in April, loss being 50% of the seedlings in some cases. The weather was cool and cloudy (C.D. McKeen).

STEM ROT (Sclerotinia sclerotiorium). Several plants were killed by stem rot in one greenhouse at Ruthven, Ont. (C.D. McKeen).

MOSAIC (virus). All field plantings of cucumbers and muskmelons in Essex Co., Ont., showed some infection, the highest being 4%. Mosaic also affected greenhouse cucumbers but it was much less common than in 1946 (C.D. McKeen). Several plantings were slightly infected in Lincoln Co. (J.K. Richardson).

EGG PLANT

VERTICILLIUM WILT (V. ?Dahliae). Several plants were affected in a seed plot at Summerland, B.C. (G.E. Woolliams). The disease was present in every planting in Essex Co., Ont., infecting 2-4% of the plants (C.D. McKeen). Not a planting was observed free from infection in Lincoln Co., Ont., and in some many plants were severely stunted and failed to produce fruit (J.K. Richardson).

HOPS

DOWNY MILDEW (Pseudoperonospora Humuli) continues to be a serious disease of hops in the Fournier district, Ont. In yards which were dusted but not sprayed up to half the crop was lost due to the disease. Downy mildew was effectively controlled with copper sprays (L.T. Richardson).

POWDERY MILDEW (Sphaerotheca Humuli) is general in the Fournier district, Ont., but it is not a serious pest as it readily responds to either dusts or sprays (L.T. Richardson).

NETTLEHEAD (virus). Typical nettlehead symptoms were seen on 4 plants in a planting at the Station, Fredericton, N.B. The affected vines were very weak and failed to climb the poles provided for their support. Only a few distorted cones containing no seed were formed. The disease was transmitted to healthy hop plants by cleft grafting in the greenhouse (D.J. MacLeod).

HORSERADISH

WHITE RUST (Cystopus candidus). Affected specimens were received from Chatham, Ont., from a grower who claimed that the disease was causing severe injury in his commercial planting (J.E. Howitt). White rust heavily infected horseradish plants in the Botanical Garden, Montreal, Que. (J.E. Jacques).

LETTUCE

GREY MOULD (Botrytis cinerea) severely affected a few plants at the Station, Saanichton, B.C., in 1946 (W. Jones). A moderate infection was found in lettuce at Point Grey (I.C. MacSwan).

DOWNY MILDEW (Bremia Lactucae) was quite general on the lower leaves of lettuce at Agassiz and Point Grey, B.C. (I.C. MacSwan).

DROP (Sclerotinia sclerotiorum) was reported as follows: 10% of the seed plants of New York 12 killed at the Farm, Agassiz, B.C., in 1946

(W. Jones); found on lettuce grown for seed at Armstrong (G.E. Woolliams); 10% of the plants killed in the plots at Edmonton, Alta.; disease severe on all varieties of head lettuce at Lacombe (J.D.G.).

POTASH DEFICIENCY. In the London district, Ont., there were areas in a planting of head lettuce where the plants were somewhat stunted, leaves were chlorotic with yellow mottling and necrosis of both the margins and areas within the leaf. Soil from affected areas in the field revealed potash deficiency (J.K. Richardson).

TIP BURN (physiological). A planting of 15,000 heads of Iceberg lettuce at Grafton, N.S., was nearly a total loss on account of tip burn. One cut was made on 10 July following a heavy rain on the 8th. The weather was very hot on the 11th and 12th with fog at night. By the 14th the whole field was affected (K.A. Harrison).

MELON

LEAF SPOT (Alternaria cucumerina) was found in a few fields of muskmelon in the Harrow district, Ont., but it caused slight damage (C.D. McKeen). A single hill of variety 11-38 showed considerable spotting in a variety test at Aldershot (R.G. Atkinson).

SCAB (Cladosporium cucumerinum) was found in one muskmelon field at Leamington, Ont., where it caused slight damage to the stems and leaves (C.D. McKeen).

BACTERIAL BLIGHT (Erwinia tracheiphila) was observed in many muskmelon fields in Essex Co., Ont., but the damage was usually slight; 0.3% of the plants were affected and died in a plot at the Station, Harrow (C.D. McKeen).

POWDERY MILDEW (Erysiphe Cichoracearum) appeared in epidemic proportions in most muskmelon fields in the Leamington district, Ont., causing extensive killing and defoliation; the loss in crop varied from 25 to 50% (C.D. McKeen).

FUSARIUM WILT (F. bulbigenum var. niveum) was present to some extent in many muskmelon fields in Essex Co., Ont. Wilt was particularly severe in 4 fields, where the number of wilted or dead plants at the time of first picking was 86.5%, 75%, 69% and 25% respectively (C.D. McKeen). In varietal trials for wilt resistance conducted at Aldershot, in co-operation with Ont. Agricultural College, infection was quite severe in the more susceptible varieties and resulted in the death of a few hills. However, some varieties in the test showed a high degree of resistance (R.G. Atkinson, J.J. Miller).

DAMPING-OFF (Pythium sp.) caused considerable loss in most seedbeds in Essex Co., Ont., in May. Rainy and cloudy weather retarded plant growth and the seedlings were under attack for a longer period than usual (C.D. McKeen).

MOSAIC (virus). Several melon plantings in the Aldershot district, Ont., showed 1-5% of the plants affected by mosaic (J.K. Richardson). Mosaic severely affected the leaves and fruits of Iroquois and Perfecto melons in the Botanical Garden, Montreal, Que. (J.E. Jacques).

ONION

PURPLE BLOTCH (Alternaria Porri) caused moderate leaf and stalk injury in a 2-acre field at Harrow, Ont. (C.D. McKeen).

NECK ROT (Botrytis Allii). Two cases of neck rot were encountered: slight infection in Yellow Danvers from Port Moody in Jan. 1946, and moderate infection in Portugal at Sidney, B.C. in Jan. 1947. From the second specimen the organism was isolated and identified (W. Jones). Neck rot was affecting less than 1% of the bulbs of all varieties planted for seed production in the Grand Forks area in June. About 10% of the onions from one field of Yellow Globe Danvers that had not been thoroughly cured were affected at Grand Forks on 8 Oct.; the loss may be severe if these onions are kept in storage to the end of the season (G.E. Woolliams). A moderate infection was seen in one lot of stored onions at Saskatoon, Sask., this fall (R.J. Ledingham). A slight infection was observed in September at Ste. Anne de Pocatiere, Que. (R.O. Lachance).

DOWNY MILDEW (Peronospora destructor) was general and rather severe in a seed crop at Duncan, B.C., in 1946 and in garden crops at Campbell River and Sidney in 1947 (W. Jones). Downy mildew was present on the seed crop only in some fields in the Kelowna, Vernon and Armstrong districts on July 4; none of the fields were seriously affected. A slight infection was recorded on both the seed and bulb crops in the Grand Forks district on 25 July (G.E. Woolliams). Downy mildew was reported from many parts of Ont. again this year and in some cases it caused apparently severe losses (J.E. Howitt). A slight infection was found at L'Assomption, Que. (L.T. Richardson).

STORAGE ROT (cause unknown) caused moderate damage to onions in storage at New Westminster, B.C. Among the fungi present was Papulaspora sp. (I.C. MacSwan, I.L. Conners).

PINK ROOT (Phoma terrestris Hansen). Affected specimens were received from Tilbury, Ont. (C.D. McKeen). This disease has not been previously reported in Canada; it was originally described by H.N. Hansen (Phytopath. 19(8): 691-704. 1929).

SMUT (Urocystis Cepulae) was found in 2 nearby fields at Kelowna, B.C. In one field, where the bulbs were being grown for seed production, only one diseased plant was found. Seed produced earlier in the field was used to sow the nearby field, which was in a commercial crop. In the latter, affected onions were found in patches throughout the field. Loss would be slight this year; as far as possible all infected plants were removed by the grower, and when the field was thinned in accordance with standard practice, there was still a good stand over the whole field. According to

the grower, the disease was first noticed about 2 years ago. Imported onion sets were planted in this field in 1944 and it seems possible that it was in this way the disease was introduced. This is the first record of onion smut in the Okanagan Valley (G.E. Woolliams). Damage was moderate to heavy in one field at St. Laurent, 3 at Cote St. Michel and one at St. Leonard de Port Maurice, Que. (E. Lavallee).

ASTER YELLOWS (Callistephus virus 1) was observed in a field of seed onions adjacent to a 1/4 acre field of Warba potatoes, where 80% of plants were affected by purple top (q.v.) at Portage la Prairie, Man. (D.J. Petty). Two plants apparently affected with aster yellows were found in a small planting of seed onions at Bradford, Ont. (H.N. Racicot).

YELLOW DWARF (virus) was first found in the Grand Forks district, B.C., in the section devoted to the production of seed of the variety Ebenezer. In 1947, the disease has now been found on onion seed crops in all parts of the district and on all the varieties (Yellow Globe Danvers, Ebenezer, Early Yellow Globe, Red Withersfield, Mountain Danvers) being grown, a trace to 15% of the plants being affected on 15 June. Infection is most serious in the zone devoted to Ebenezer and the adjacent Early Yellow Globe zone. Yellow dwarf was found again at Vernon, B.C., where about 10% of the plants of Yellow Globe Danvers in seed crops and 1% in bulb crops were affected (G.E. Woolliams).

PARSNIP

ROOT KNOT (Heterodera marioni). All parsnip plants were severely affected in a 1/2-acre field at Dorval, Que.; the field was a total loss (Roger Desmarteau).

PEA

LEAF and POD SPOT (Ascochyta Pisi). Infection was severe on pea specimens received from Prince Rupert, B.C. Early varieties were stated to be only slightly affected in the same home garden (I.C. MacSwan).

A survey was made for disease in pea fields when at the pod stage in 4 districts in Alta. Rainfall was light at Lethbridge during the latter part of June and throughout July. In the other districts it was much heavier during July, particularly at Beaverlodge.

District	Fields		Fields Affected by					
	Examined	Diseased	Pseudomonas pisi		Ascochyta Pisi		Septoria Pisi	Peronospora Pisi
			(1)	(2)	(1)	(2)	(1)	(1)
Lethbridge	26	21	12	0	0	0	6	6
Edmonton	8	8	3	2	4	1	0	0
Athabaska	4	4	4	0	3	0	0	0
Beaverlodge	6	6	0	0	4	2	0	0
All Alberta	44	39	19	2	11	3	6	6

(1) Infection trace to slight. (2) Infection moderate to severe.

Of the 44 fields inspected 37 were grown for seed; no apparent difference was noted in the amount of disease in these fields compared with those grown for other purposes. The absence of leaf and pod spot at Lethbridge was probably due to the low rainfall. The disease was present and sometimes severe in fields in the other districts. Infection was trace to severe in gardens in the Edmonton district and in varietal test plots at the University it was a trace to moderate in 18 of the 69 seed lots representing 27 varieties in the test. At the Beaverlodge Station infection was severe on Alaska and Wisconsin Early Sweet and slight on Giant Stride (J.D. Gilpatrick).

Some pod spot developed as a result of rains in August in a planting near Saskatoon, Sask. (T.C. Vanterpool).

Leaf and pod spot was present only in trace amounts in variety plots at Wellington, Ont., 10 July. Some fields in Ont., however, became severely infected before the seed crop was ripe as some of the seed samples of the 1947 crop being presently examined are heavily infected.

Pea seed samples have been examined each year for several years at the Laboratory, Ottawa, Ont., to determine their suitability for seed. A total of 778 samples chiefly of Foundation, Elite and Registered seed were examined from the 1946 crop. Of these samples 397 (51%) were suitable for seed, 289 (37%) were suitable if treated, and 92 (12%) were unsuitable. Most of the samples considered unsuitable contained more than 3% of the seeds affected by Ascochyta spp. A tabulation of the results obtained from tests made on the 1939-1946 crops revealed that the three species were present in the ratio of 16 A. Pisi (leaf and pod spot), 5 A. pinodes (Mycosphaerella blight) to 2 A. pinodella (Ascochyta root rot) (W.C. Broadfoot).

Leaf and pod spot was unimportant in P.E.I. in 1947; a light infection was seen in one planting in Queens Co., (R.R. Hurst).

GREY MOULD (Botrytis cinerea) was common on pods of plants among weeds in a seed crop of Giant Stride on Lulu Island, B.C., in 1946 (W. Jones).

POWDERY MILDEW (Erysiphe Polygoni). Infection was moderate on a late-sown crop of Alderman at Beaumont, Que. (R.O. Lachance); severe on a

garden patch of Fenland Wonder, part of which had been left to mature seed at Kentville, N.S. (K.A. Harrison); and light on a planting in Queens Co., P.E.I. (R.R. Hurst).

ROOT ROT (Fusarium sp.) caused severe damage in a garden at New Westminster, B.C.; the pathogen was isolated (W. Jones). Infection was very heavy on a variety in plots of a cultural experiment at Smithfield, Ont. on 3 July; a Fusarium was isolated (H.N. Racicot, W.C. Broadfoot). Infection was severe in a plot of Thomas Laxton, which was a total loss, at Ste. Anne de la Pocatiere, Que. The disease was also present in field peas, but it was less prevalent than in previous years (R.O. Lachance). Root rot caused moderate to severe damage in many plantings in York Co., N.B. Isolations were not made this year, but Fusarium spp. and Rhizoctonia Solani have been isolated from diseased roots in previous years (J.L. Howatt). About half the plants were affected and died early in a planting of Fenland Wonder at Kentville, N.S. (K.A. Harrison). In a test plot at the Kentville Station the variety Radium showed appreciable injury (30% infection) (J.F. Hockey).

MYCOSPHAERELLA BLIGHT (M. pinodes) was not encountered during the survey for pea diseases in Alta. in 1947, nor has the organism been isolated to date at Edmonton. However, the fungus has been isolated a few times at Ottawa from Alta. samples (J.D. Gilpatrick, W.C. Broadfoot). Considerable blight was seen on some varieties in the trials at the Horticultural Station, Smithfield, Ont. (W.C. Broadfoot).

DOWNY MILDEW (Peronospora Pisi) was general and caused slight damage at Sidney, B.C. (W. Jones). Traces occurred at the Lethbridge Station and district, Alta. (J.D. Gilpatrick). A trace, the lesions mostly old, was found in a variety test at Wellington, Ont., 10 July (I.L. Conners).

BACTERIAL BLIGHT (Pseudomonas pisi) was moderate in a well-isolated field that had never grown peas before; this field was one of two moderately to severely affected in the Edmonton district, Alta. (see table above). Hail damage seemed to increase its prevalence. Infection was a trace to severe in Edmonton gardens and a trace to slight on the odd variety at the Lethbridge, Olds and Beaverlodge Stations (J.D. Gilpatrick).

ROOT ROT (Rhizoctonia Solani) destroyed a few plants at Edmonton, Alta. (J.D. Gilpatrick).

LEAF SPOT (Septoria flagellifera). A moderate infection occurred on Chancellor at Indian Head, Sask., in late August (H.W.M.).

LEAF SPOT (Septoria Pisi) was severe in several gardens at Edmonton and one at Calgary, Alta. Infection was a trace to severe on 44 of the 59 lots tested in the plots at Edmonton (J.D. Gilpatrick). The disease was prevalent and injurious to the leaves of Lincoln and Onward at Birds Hill, Man. A trace of S. flagellifera was also present (W.L. Gordon). Infection was severe in a planting of Alaska at Beaumont, Que. (R.O. Lachance).

RUST (Uromyces Fabae). A slight to moderate infection was observed in a commercial planting of Lincoln at North Kildonan, Man.; this rust is seldom found on peas in Man. (W.L. Gordon). A trace of rust was observed on a planting at Charlottetown, P.E.I. (R.R. Hurst). The rust was inadvertently reported in P.D.S. 26: 42, as U. Pisi (I.L.C.).

MOSAIC (virus) affected 5% of the plants in a plot of Alderman at the University, Vancouver, B.C. (I.C. MacSwan). A trace of mosaic (Pisum virus 1) was found in 3 fields in York Co. and in a small garden at Fredericton, N.B. (D.J. MacLeod).

PEPPER

FRUIT SPOT (Diaporthe Phaseolorum var. Sojae). A few fruits of Pennwonder sweet pepper were affected in a plot at the Station, Harrow, Ont. (C.D. McKeen).

SOFT ROT (Erwinia carotovora). In late August and in September, 4 to 5 fruits per plant, both green and ripe, were attacked and rotting in many plantings in Essex Co., Ont. Corn borer larvae were found in diseased fruits and probably provided an avenue of entrance for the organism (C.D. McKeen).

ANTHRACNOSE (Gloeosporium piperatum Ell. & Ev.) was found on a few fruits of sweet peppers in a plot at the Station, Harrow, Ont. (C.D. McKeen). This disease appears not to have been previously reported to the Survey (I.L.C.).

DAMPING OFF (Rhizoctonia Solani and Pythium ultimum) was found affecting seedlings of all pepper varieties in nearly every greenhouse in Essex Co., Ont.; losses varied from a few up to 80% of the seedlings in some flats (C.D. McKeen).

BACTERIAL SPOT (Xanthomonas vesicatoria) caused considerable leaf spotting and much defoliation in one planting of sweet and hot peppers in Essex Co., Ont. Spots also occurred on the fruits and pedicels (C.D. McKeen).

INFECTIOUS CHLOROSIS (virus). A single plant was seen in a seed plot of Paprika peppers at Summerland, B.C. (G.E. Woolliams).

MOSAIC (virus) affected 2% of the plants of California Wonder sweet pepper in a planting in Essex Co., Ont. (C.D. McKeen). Mosaic was present to some extent in most plantings of sweet and hot peppers in Lincoln Co., but losses were insignificant (J.K. Richardson).

BLOSSOM-END ROT (non-parasitic) affected 2-5% of the fruits in every planting in Essex Co., Ont. Alternaria fruited abundantly in the affected areas (C.D. McKeen).

SUNSCALD (non-parasitic). A number of fruits with tan-coloured soft areas on the exposed side was found in every planting in Essex Co., Ont. (C.D. McKeen).

POTATO

The Plant Protection Division, Science Service, has supplied the data, included in Tables 4 - 7, on the Seed Potato Certification work. All fields of potatoes entered for certification are planted with Foundation or Foundation A seed.

Table 4. Seed Potato Certification.
Number of Fields and Acres Inspected, 1947

Province	Number of Fields		Fields Passed	Number of Acres		Acres Passed
	Entered	Passed	%	Entered	Passed	%
P.E.I.	8,540	7,257	84.9	33,496	29,223	87.2
N.S.	579	554	95.5	1,256	1,206	96.0
N.B.	2,500	2,355	94.0	16,383	15,515	94.0
Que.	904	678	75.0	2,321	1,667	71.8
Ont.	892	718	80.3	2,922	2,365	80.9
Man.	162	129	79.6	648	573	88.4
Sask.	106	91	85.8	147	105	71.6
Alta.	197	175	89.2	614	550	89.6
B.C.	736	649	88.2	2,598	2,270	87.4
Total	14,616	12,606	86.2	60,385	53,474	88.5

Previous Yearly Totals

1946	14,198	11,628	81.9	68,666	55,256	82.8
1945	11,267	9,501	84.3	50,646	40,866	80.7
1944	8,500	7,567	89.0	31,633	28,616	90.4
1943	9,562	5,520	57.7	34,947	19,148	54.8

Acres Entered		Acres Passed	
1946	66,665	1946	55,256
1947	60,385	1947	53,474
Decrease of 6,280 or 9.4%		Decrease of 1,782 or 3.2%	

Table 5. Seed Potato Certification: Acreage Passed by Varieties, 1947.

Variety	P.E.I.	N.S.	N.B.	Que.	Ont.	Man. Alta.	B.C.	Total
Katahdin	2,617	574	9,984	4	1,498	56	33	14,766
Green Mountain	9,196	132	3,061	1,593	119	25	116	14,241
Irish Cobbler	11,900	171	665	67	245	297	12	13,357
Sebago	5,315	102	231		67			5,715
Netted Gem	1		1			583	1,422	2,007
Bliss Triumph		185	1,439			64	4	1,692
White Rose	3		1			6	420	430
Chippewa	36				365	9	19	429
Warba	2	16	5		13	59	90	185
Sequoia	132	7					1	140
White Bliss			117					117
Houma	18							18
Pontiac	3		11					14
Cahus						8		8
Teton					4			4
Menominee						1		1
Others	1	19	3		54	120	153	350
TOTAL	29,223	1,206	15,515	1,667	2,365	1,228	2,270	53,474

Table 6. Seed Potato Certification: Fields Rejected on Field Inspection, 1947.

Province	Leaf Roll	Mosaic	Ring Rot in field	Ring Rot on farm	Black Leg	Adjacent Diseased Fields	Foreign Varieties	Misc.	Total
P.E.I.	189	358			193	63	175	305	1,283
N.S.	8	1			3	3	5	5	25
N.B.	47	9	27	2	13	6	29	12	145
Que.	11	13	110	20	16	22	9	25	226
Ont.	42	5	60	12	7	5	3	40	174
Man.			12	9	1	1		10	33
Sask.	1		8					6	15
Alta.		1	3	5	8	1		4	22
B.C.	4	11			7	8		57	87
TOTAL	302	398	220	48	248	109	221	464	2,010
Rejections as a percentage of fields:									
Entered	2.1	2.7	1.5	0.3	1.7	0.7	1.5	3.3	13.8%
Rejected	15.0	19.8	10.9	2.4	12.3	5.4	11.0	23.2	100%

Table 7. Seed Potato Certification: Average Percentage of Disease found in Fields, 1947.

Average Percentage of disease found in	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
	%	%	%	%	%	%	%	%	%
Fields entered: (first inspection)									
Black Leg	.20	.05	.08	.12	.16	.09	.03	.29	.07
Leaf Roll	.37	.19	.40	.09	.16	.08	.15	.08	.08
Mosaic	.27	.06	.02	.09	.03	.01	.10	.02	.10
Fields passed (final inspection)									
Black Leg	.04	.04	.06	.07	.02	.05	.03	.05	.06
Leaf Roll	.13	.14	.30	.07	.04	.02	.05	.03	.09
Mosaic	.06	.05	.01	.04	.02	-	.02	.01	.08

The potato seed crop grown in 1947 was slightly smaller than in the previous year. The percentage of crop passing certification was unusually high. The number of rejections for leaf roll was low, particularly in N.B. Rejections were high in N.B. in 1945 and 1946, and in both N.B. and P.E.I. in 1942 and 1943, but they were about 1.0% of the fields entered in both provinces in 1944. The increasing use of DDT may so reduce the population of aphid vectors that marked fluctuations in the amount of leaf roll in seed potato fields may no longer occur, but several seasons must elapse without any appreciable change in the varieties grown before the low incidence of leaf roll may be attributed to the wide use of DDT. Mosaic caused more rejections in 1947 especially in P.E.I. than the previous year. Ring rot is still an important disease in the seed crop in some provinces; it was the cause of rejection of 14.4% of the crop entered for certification in Que., 13.0% in Man., 8.1% in Ont., 7.5% in Sask., 4.1% in Alta. (with none in 1945 and 1946) and 1.2% in N.B. Complete information is not available on the amount of disease in table stock, but it is known that only traces occurred in P.E.I., N.S. and B.C. (none this year), 6.6% of the fields in Alta., 11% in Ont., and considerable in Que. In general the situation is less critical with the exception of Man., Sask. and possibly Que.

COMMON SCAB (Actinomyces scabies) was found in B.C. on many crops of smooth-skinned varieties (Early Epicure, Irish Cobbler, Green Mountain, Katahdin, Warba, White Rose) and on a few crops of Netted Gem. Infection varied greatly in prevalence and severity even in different parts of the same field. The worst crop was one under irrigation in the Cariboo district; 60% of tubers were below certified seed grade (H.S. MacLeod). Scab was observed everywhere in Alta. and was more severe than usual in central and northern sections on smooth skinned varieties; only one lot of Netted Gem showed scab on bin inspection (J.W. Marritt). Moderate to severe infections were present on susceptible varieties in some districts in Sask. (A. Charlebois). Scab was unusually prevalent in the Saskatoon area in 1947; the season was very

dry (R.J. Ledingham). Scab was negigible in Man., but in a few fields in the Kenora and Thunder Bay districts in Northwestern Ont., scab was slight on 3 - 6% of the tubers and moderate on 4% (D.J. Patty). Scab was present in most plantings of Irish Cobbler in Essex Co. and was more prevalent than last year (C.D. McKeen). Scab was slight throughout Southwestern Ont.; it appeared to be less severe in 1946 and 1947 than in previous years (F.J. Hudson). In counties along Lake Ontario, including York and Frontenac, common scab was sufficiently prevalent this year to necessitate grading out the scabbier tubers or in some cases marketing the entire crop as table stock. In Durham Co., potatoes suffer from a type of scurfy scab, which in its milder forms closely resembles the normal netting or russetting of Netted Gem. In some counties, including Dufferin and Wellington, the scab lesions are deep or pitted and are frequently associated with severe scab-gnat injury; when so injured the crop is ineligible for seed and very unattractive as table stock. It is estimated that 25 - 50% of the tubers of the susceptible varieties such as Irish Cobbler, Chippewa, and Katahdin are unfit for seed each year on account of scab. It varies, of course, with individual growers and grower practices. On farms where scab is severe we would like to be able to suggest to the grower that he grow one of the fairly excellent varieties highly resistant to common scab that have proved their worth in New York and other states. Unfortunately, with the exception of Menominee, a rather rough growing variety, the other varieties, Ontario, Seneca and Cayuga (F.M. Blodgett and F.L. Stevenson Am. Pot. Jour. 23 (9). 315-329. 1946) are not at present licensed in Canada and, therefore, ineligible for certification. There is a definite need for such varieties and these American varieties would fill a place until Canadian ones were available (W.L.S. Kemp). In Inspection District 3, scab is apparently becoming more serious on certain farms especially on the heavier types of soil. Scab-resistant varieties seem to be the best answer. On one farm a block of Ontario was planted in the centre of a field of Katahdin; and abundance of scab developed on the Katahdin but there was practically none on the Ontario variety.

It has been observed that when growers use heavy applications of commercial fertilizers scab may develop on farms where it has never been present to any extent before. A study is contemplated of the kind of filler used in fertilizers (H.W. Whiteside). Fertilizer fillers appear to be of two kinds: neutral sand or limestone, now usually dolomitic limestone. The latter could hardly be added to the potato crop with safety (I.L.C.). Slight scab was found in a few crops in eastern Ont. (O.W. Lachaine).

Scab infection was general but slight along the lower St. Lawrence and in Eastern Townships, Que., but it was less prevalent than usual. Scab appeared in a few lots in the Chicoutimi region, but the affected tubers were easily removed (E. Baribeau). Scab was more prevalent than usual in N.S.; it was present in 45% of the crops inspected and about 10% of the tubers were affected. Three crops with about 80, 75 and 50% of the tubers affected were sold as table stock (R.C. Layton). Scab was unusually heavy in many crops in P.E.I. in 1947 and was much more prevalent than for several years. A slight infection occurred in the resistant Sebago (S.G. Peppin).

EARLY BLIGHT (Alternaria Solani) was found in 87 (11.8%) of the fields inspected in B.C., but it was severe in only one (H.S. MacLeod). Infection was slight in 45 fields and moderate in 10 of 197 inspected in Alta.; the disease was more widespread than usual (J.W. Marritt). Infection was slight to moderate in commercial plantings about Edmonton (J.D.G.). A slight infection was general in Sask. (R.J. Ledingham). Early blight was present in eastern Sask. and infections were moderate between Yorkton and Norquay (A. Charlebois). Traces of early blight were present in most fields in Man. and northwestern Ont., and in several fields of the early varieties on light soil infection was moderate to severe (D.J. Petty). Only a trace was found on Irish Cobbler in the Harrow district, Ont. (C.D. McKeen). A slight infection was noted in a few fields in southwestern Ont. (F.J. Hudson). Early blight was extremely scarce in Inspection District 2; the use of DDT early in the season is suggested as a contributing factor (W.L.S. Kemp). The disease was much more prevalent in 1947 than usual in District 3, although it was most severe on early varieties, many fields of the late varieties were also affected (H.W. Whiteside).

Early blight was general throughout Que., except in the northern sections, on account of the drought. In some fields it appeared in early July and caused much damage to the foliage; the yield was reduced 8 - 10% where the fields were not sprayed. A slight amount of tuber rot was reported in a lot of Green Mountain near Quebec city. (B. Baribeau). Early blight was noticed in fields of Irish Cobbler and Bliss Triumph in N.B., but it caused no serious damage (C.H. Godwin). Early blight was less prevalent than last year in N.S., but it became fairly general. Infection was heavy in Colchester and Antigonish Counties and some fields were completely destroyed in the latter county. It was severe in Kings Co., in a few fields of Irish Cobbler. To date no Alternaria rot has been noted (R.C. Layton). Early blight was obviously more prevalent in P.E.I. than the previous year; the damage was moderate in the North River plots (L.C. Calbeck, S.G. Peppin). An occasional tuber of Irish Cobbler was affected in a lot examined 17 Feb. 1947 (R.R. Hurst). One crop showing upwards of 1% tuber rot was seen this fall (S.G. Peppin).

DRY ROT (Armillaria mellea) affected a few tubers in a planting at North Saanich, B.C. (W. Jones).

STEM ROT (Botrytis cinerea) was affecting 15% of the plants in plantings of Sebago and Green Mountain at Hunter River, P.E.I. (G. Ayers).

BACTERIAL RING ROT (Corynebacterium sepedonicum). In the production of certified seed, fewer rejections were made across Canada in 1947 than in any year since apparently healthy fields were rejected if ring rot was found anywhere on the farm. The figures for each province are given in Table 6. Bacterial ring rot was not observed in B.C. (H.S. MacLeod). An inspection was made of all commercial crops in the Courtenay district, B.C., where the last outbreak occurred; no new cases were found. Even though no ring rot was found on the 4 farms affected in 1946, the potatoes are being marketed in non-potato producing areas. A number of carloads were inspected from the Okanagan Valley, Columbia Valley and the Coast, but no ring rot was found. A specimen suspected of being affected by ring rot was received from a householder at Pouce Coupe, in the B.C. section of the Peace River District (W.R. Foster).

Some slight progress was achieved in the control of bacterial ring rot in Alta. in 1947. Although only 1127 fields were inspected the survey was as complete as in previous years because substantially fewer farmers grew potatoes for market in 1947. Ring rot was found on 76 farms compared with 103 in 1946, but the percentage of infected farms remained almost unchanged.

The tabulation below shows what progress has been made in the control of ring rot:

Year	Number of Fields		Change in Number Diseased over previous year	Percentage Diseased
	Inspected	Diseased		
1940	261	73	+ 33	28.0%
1941	430	102	+ 29	24.7
1942	406	151	+ 49	37.3
1943	965	235	+ 84	24.1
1944	1010	241	+ 6	24.8
1945	1198	137	-104	11.4
1946	1637	103	- 34	6.3
1947	1127	76	- 27	6.6

Regulations for the control of ring rot were passed in 1942 and were put into effect that fall. Considerable improvement in the situation resulted. Very few prosecutions were made in 1943, but in the winter 1943-44 substantial penalties were requested for violators of the regulations. In 1945 the percentage of farms on which ring rot was found dropped from 24.8% to 11.4%. A substantial reduction was secured the following year by the same means. During the past year more reliance was again placed on educational efforts and only one prosecution was made. However, the percentage of farms on which the disease was observed increased slightly to 6.6%. It would appear that educational means, however thorough, are insufficient and more rigid enforcement of the regulations will be necessary to reduce the disease further (J.L. Eaglesham).

The 8 rejections (Table 6) in Alta. were the first since 1943 (J.W. Marritt). About a dozen specimens were received at the Laboratory from scattered points in Sask.; last year 8 samples were received. Ring rot affected 15 - 20% of the plants in a field of Bliss Triumph and trace in other varieties at North Battleford (R.J. Ledingham). Numerous plants were affected in table stock fields near Saskatoon and in the Cravan--Lumsden area (A. Charlebois).

Ring rot was found in 13 of the 21 samples of diseased tubers submitted for examination from Man.; 2 of the infected samples were from table stock (W.A.F. Hagborg). No ring rot was found in northern Ont. (D.J. Petty).

In Ont. 72 fields (Table 6) entered for certification were rejected on account of ring rot. In Inspection District 3, the disease occurred in the Cochrane District, Dufferin and southern Simcoe Counties. All varieties were equally affected. Except for some seed of Warba,

infection of the seed was apparently due to the use of machinery or other equipment which had become contaminated when used in handling table stock on the same farm. All infected crops are being disposed of as table stock and an organized clean-up is being carried out in these districts. A similar programme was carried out in 1946 in the Sudbury District and in a small area in northern Simcoe. The programme included disposal of all potatoes in an isolated township in the Sudbury district and a thorough disinfection of all premises and machinery. A carload of Foundation A Chippewa seed from a ring-rot free area was planted. Four inspections were made: 2 in the growing season, one at digging time and a final bin inspection. No ring rot was found at any time. The programme in northern Simcoe was also successful (H.T. Whiteside). In District 2, besides 26 cases of ring rot in fields entered for certification, the disease was found in a crop of Menominee grown by the largest grower of table stock in Ont., who had 152 acres in potatoes this year. The presence of infected table stock in seed producing areas is a distinct menace to the latter crop. A campaign similar to those carried out in District 3 in 1946 is needed in Wellington Co. (W.L.S. Kemp).

Since 1943, an annual survey has been made of table stock potatoes on farms in the chief potato growing areas in Ont. by the Provincial Department of Agriculture as part of its programme for the control of bacterial ring rot. Some of the results obtained are summarized below:

Year of Survey	Number of Farms		Percentage
	Inspected	Diseased	Diseased
1943	902	157	17%
1944	3,000	468	15%
1945	3,300	281	9%
1946	3,200	678	21%
1947	3,100	351	11%

In 1947, ring rot was found in potatoes on 351 (11%) farms. Of these 265 (8.5%) had it for the first time in the 5-year period; of the remaining 86, 77 (2.5%) were repeats from the previous 2 years and 9 (0.3%) were considered reinfections. The value of the survey is borne out by the fact that fewer farms are now infected and the rate of infection is lower. Moreover the annual survey is the best means of providing information on the prevalence and distribution of the disease from year to year. For additional details see L.T. Richardson and R.E. Goodin. Five years of bacterial ring rot. Proceedings Ont. Crop Improvement Assoc. 1948 (L.T. Richardson). Not only was bacterial ring rot the major cause of rejection of fields entered for certification in Que., but the disease is still quite prevalent in table stock fields. The loss in 1947 was estimated at 10-12% of the crop (B. Baribeau). The potato crop in Que. for 1947 was estimated to be 9,517,000 cwt. by the Dominion Bureau of Statistics. The loss in yield was therefore 1,057,000 to 1,298,000 cwt. At $1.88 per cwt., the farm value in 1946, the loss from ring rot was $1,987,000 to $2,440,000 (I.L.C.).

Ring rot was less severe than in recent years both in the seed crop and table stock in N.B. (C.H. Godwin). Despite increased sources of infection and a favourable season, little ring rot was found affecting plants in the field or tubers in storage in N.B. It is suggested that the low incidence of ring rot is due to the action of a bacteriophage. Hundreds of isolations from externally intact, diseased tubers failed to grow and many that did underwent lysis (J.L. Howatt). In 1946 a preliminary survey was conducted for bacterial ring rot in table stock fields in 9 counties in N.S. This year it was decided to make a complete survey of the potato producing area in Kings and Colchester Counties. Inspectors were to call at every house in these districts, however small the acreage, and to visit every farm where ring rot was found last year. A total of 1,405 fields (1,295 acres) was inspected and ring rot was found in 8 fields (13.25 acres) in Kings Co. and, since the survey was completed, a ring rot infected sample was received from Pictou Co. Ring rot was not found again on the farms where it occurred last year. Infection in these 8 fields appeared to have arisen in most instances from the use of contaminated bags or containers from the dehydration plant, Kentville. No case of ring rot could be traced to its presence in certified seed (R.C. Layton). As a result of a province wide survey only 4 cases of ring rot have been found in P.E.I. in 1947 compared with 28 last year (S.G. Peppin).

POTATO ROT NEMATODE (Ditylenchus destructor). The potato rot nematode was first reported in Canada in 1945, after its discovery at York and Uigg, P.E.I. (P.D.S. 25 (1945);66). An area of possible infestation was defined and placed under quarantine, in which it was not permitted to grow potatoes. Research work was undertaken to determine the best means of eradicating the parasite. No case of this nematode was found in 1946.

In 1947, another infestation was found around Bideford, P.E.I., where some of the crops on 7 farms, grown in 8 fields with an area of 40 acres, were found infected. An investigation made in that district leads one to believe that that infestation has no connection with those at York and Uigg, but that it is of long standing. Bideford is the site of an early pioneer settlement, and of an important ship building industry in years gone by. At that time, ships plied back and forth between there and Europe, and it is possible that the infestation dates back to those days. Bideford has never been a seed potato growing section, and little interchange of seed with other districts of the province has taken place (R.R. Hurst, G.W. Ayers, H.N. Racicot).

BLACK LEG (Erwinia phytophthora) was found in 149 (20%) of the fields inspected in B.C., and caused the rejection of 7 fields; the disease was present in more fields but the rejections were fewer than in 1946 (H.S. MacLeod). Black leg was found in 55 fields mostly in the irrigated districts of southern Alta.; 8 fields were rejected (J.W. Marritt). Damage by black leg was slight to severe in commercial plantings at Edmonton; 8% of the plants were affected in one garden (J.D.G.). Infection was high for several rows in the centre of a field of Earley Ohio, in Sask., planted with Foundation A seed which showed no black leg in 1946. Some 17% of the plants were affected in these diseased rows with lesser amounts in the adjacent rows. The balance of the field averaged less than 0.5% and 3 other fields planted with the same seed showed no infection. A high

infection was also seen in plots of Irish Cobbler planted in tuber units. Where present in other fields infection was slight (A. Charlebois). About a fifth of the fields inspected in Man. showed a trace to 1% infection; one field was rejected. Infection was still lighter in northwestern Ont. (D.J. Petty). Black leg was severe in some fields at Springfield, Man. (W.A.F. Hagborg).

Black leg was found in 6 fields entered for certification in southwestern Ont.; in all affected plants found the disease appeared to have been carried by the seed corn maggot (F.J. Hudson). Seven fields were rejected for black leg in Inspection District 2. Most of these fields were in Wellington Co. where considerable corn is grown (W.L.S. Kemp). Black leg was not prevalent in District 3 and caused little loss. Seed treatment is generally practiced. No rejections occurred in 1947 (H.W. Whiteside). It was present in 9 fields in eastern Ont., but none were rejected (O.W. Lachaine). Black leg was largely confined to the Chicoutimi and Lake St. John districts, Que. Of the 16 fields rejected, 11 were in these districts (B. Baribeau). Some 5% of plants were affected by black leg in a small poorly drained field at Ruisseau Vert on the north shore of the lower St. Lawrence, where it appeared to be associated with ring rot (C. Perrault). Black leg was again quite severe in Sebago in N.B. The disease was more prevalent than usual in the other varieties but its presence may be attributed to the delay in planting on account of wet weather. A large amount of cut seed remained unplanted until the weather became more favourable (C.H. Godwin). Black leg was less prevalent in N.S. than in 1946. Infection was usually slight and except for a few fields of Katahdin it was virtually confined to Sebago. The 3 rejected fields were in Sebago (R.C. Layton). The disease was far more prevalent in P.E.I. in 1947 than the previous year. The percentage of fields rejected rose from 0.9% to 2.4%. Sebago is very susceptible to black leg (S.G. Peppin).

BACTERIAL SOFT ROT (Erwinia carotovora) was present in a few bins in District 3, Ont., but it was not as serious as in 1946 (H.W. Whiteside). Quite a number of affected tubers were received during the ring rot survey in Ont. All tubers showed injuries that occurred at harvest (J.K. Richardson). About 2% of the tubers were affected in a field in Temiscouata Co., Que. (B. Baribeau).

WILT (Fusarium oxysporum) was found in 137 (18.6%) fields inspected in B.C. It was present in about the same percentage of fields as last year, but it affected a higher percentage of plants in 1947; 8 fields, mostly in White Rose, were rejected. It is believed that most of the infection was from the soil (H.S. MacLeod). Wilt was not prevalent in Man. and northwestern Ont. in 1947, infection reaching 1.5% in one field (D.J. Petty). A low percentage of wilt was noted in a few fields in southwestern Ont. (F.J. Hudson). A few plants were affected at the Station, Harrow; isolations yielded the organism (C.D. McKeen). An odd wilted plant was found in a large number of fields but only one field was rejected in Inspection District 2 (W.L.S. Kemp). Wilt was more prevalent in District 3 in 1947 than last year. Two fields were rejected (H.W. Whiteside). Vascular necrosis believed to be due to Fusarium or Verticillium was found in 17 samples received through the ring rot survey. Most of these samples came from District 3 (L.T. Richardson). Wilt was very little in evidence in the growing crop in N.B. in 1947;

this freedom contrasted with its common occurrence last year (C.H. Godwin). Wilt affected 2% of the plants of Green Mountain in a field at Union Road, P.E.I.; the causal fungus resembled F. Sambucinum F.6, but it has not been positively identified. This type of wilt has also been found on Sebago at Charlottetown and Hunter River (D. Robinson).

WILT (Fusarium and Verticillium) was found in 14 (7%) of the fields inspected, most of which were located in the irrigated districts of southern Alta. (J.W. Marritt).

DRY ROT (Fusarium spp.). Many tuber samples received during the winter of 1947 from Kings, Hants, and Pictou Counties, N.S., were affected by dry rot (J.F. Hockey). The disease was again quite prevalent in the Sebago variety in P.E.I. (S.G. Peppin).

RHIZOCTONIA (Pellicularia filamentosa (Rhizoctonia Solani) was observed in 635 (86%) of the fields inspected in P.C. Infection on the plants was 473-sl. 132-mod. 30-sev. Infection where present on the tubers was slight to moderate (H.S. MacLeod). Damage was moderate in 43 fields and slight in most of the other 154 fields inspected in Alta. Tubers were relatively free from infection on bin inspection (J.W. Marritt). Some of the early planted fields were severely infested, but in general damage was usually slight in Sask.; due to late development of the tubers they were free from sclerotia (A. Charlebois). Only a slight infection was seen in most areas in Man. and northwestern Ont. (D.J. Petty). Only a slight infection developed in the tubers in the few fields where the disease was present in southwestern Ont. (F.J. Hudson). Rhizoctonia was present in many fields of Irish Cobbler in the Harrow district but infection was for the most part slight (C.D. McKeen). Rhizoctonia was fairly abundant in central Ont. and was most noticeable on white skinned varieties such as Chippewa and Sebago (W.L.S. Kemp). Rhizoctonia was more prevalent than usual on the tubers in the southern part of District 3 because digging was delayed considerably (H.W. Whiteside). Although rhizoctonia was not noticeable in the field in N.S. this year, an average of about 5% of tubers showed sclerotia at bin inspection (R.C. Layton). Rhizoctonia was more prevalent on the tubers in P.E.I. in 1947 than for several years (S.G. Peppin).

PINK ROT (Phytophthora erythroseptica) was found affecting tubers of Irish Cobbler from Cochrane and those of Chippewa from Pourquois Junction, Ont.; the pathogen was isolated (L.T. Richardson). The disease appeared on Green Mountain in the same area, at Ste. Anne de la Pocatiere, Que., where it was first observed in 1945. Again it was more prevalent (infection moderate) in the depressions in the field. There were also traces in the variety test plots, where drainage is better. The disease spread to the Laboratory plots and was severe in a small badly drained area (A. Payette).

LATE BLIGHT (Phytophthora infestans) was first reported in B.C. on 5 June from the Ladner district, in the lower Fraser Valley. The disease was observed in 205 (27.8%) of the fields inspected, infection being 124-sl. 38-mod. 45-sev. It was most severe in fields in the Courtenay district where the growers did not spray sufficiently early or

often (H.S. MacLeod, N.S. Wright). A slight and patchy infection was noted at Norquay and in 2 fields of Netted Gem at Calder, Sask. These places are in eastern Sask., where the season was wet (A. Charlebois, R.J. Ledingham). Late blight was first observed in Man. in the University plots, Fort Garry, on 22 Aug. by O.A. Olsen. The disease occurred in a large number of fields, but infection was light and occurred usually a few days before killing frost. Infection was severe in only a few fields and even in them tuber infection was slight. The weather was dry during August and September (J.E. Machacek). Traces were found in some fields in Man. and northwestern Ont. in the last week of August. Damage to the tubers was negligible. Only one field near Port Arthur showed moderate foliage infection (D.J. Petty).

Late blight was relatively severe throughout Ont. this year and caused considerable loss in unsprayed fields (J.E. Howitt). Late blight was first reported in Ont. from Eganville, Renfrew Co., on 28 July, from Goodwood, Ontario Co., on 5 Aug., Bradford Marsh, Simcoe Co., on 11 Aug. and in other parts of Ont. at still later dates. Its appearance and spread in Ontario seemed to be the natural extension of the epidemic area centred in Pa. and N.Y. which was clearly defined by 10 Aug. Both potatoes and tomatoes were affected. Its development in Ont. north of Lake Ontario indicates that weather conditions were suitable for late blight spread in that area in late July and early August, but the disease may have been more severe because of increased windborne inoculum arriving from the south (I.L. Conners).

Late blight was quite general in Lincoln Co., particularly in late fields where spraying was neglected in September and early October (J.K. Richardson). Due to heavy rains in mid-September there was considerable tuber rot in many fields in southwestern Ont. (F.J. Hudson). Late blight first appeared in District 2 about 15 Aug. It caused the tops to die prematurely. Lack of moisture coupled with late planting and early death of the vines resulted in an immature crop with yields reduced 20-25%. Little tuber rot resulted, most of the affected tubers being also sunburned. The loss from tuber rot did not exceed 10%. It appears that for the satisfactory control of late blight the growers should increase the number of applications. Moreover Bordeaux and Burgundy mixtures are evidently superior to many of the newer and more expensive preparations (W.L.S. Kemp). Late blight was more prevalent in District 3 in 1947 than in 1946. However, where crops were adequately sprayed or dusted with a recommended copper compound the disease was negligible. Failure to achieve control occurred more frequently in fields that were dusted, but the growers had not kept the plants adequately protected (H.W. Whiteside). Due to heavy rains in early September, late blight killed the foliage in many fields and caused some tuber infection in eastern Ont. In a few fields the loss was severe (O.W. Lachaine, L.T. Richardson).

Late blight spread in early August in many fields in the Montreal District, Que. Hot, dry weather held the disease in check until early September. Then it appeared rapidly and many fields were completely defoliated (E. Lavallee). Late blight was first found on the Gaspe coast on 31 July and it had been reported by 11 Aug. from nearly all potato-growing districts in Que. No epidemic developed on account of the dry weather in August, but owing to heavy dews in late August and early September many fields became moderately infected about mid-September. Tuber infection was severe (50%) in 2 parishes in Terrebonne Co.; elsewhere the loss was a trace (B. Baribeau).

Late blight was destructive in unsprayed fields in N.B. along the Bay of Fundy. It was reaching epidemic proportions in Carleton and Victoria

Counties even in sprayed fields, but weather conditions became unfavourable for late blight before much damage was done (J.L. Howatt). All fields of potatoes developed late blight in N.B. Weather was ideal for its development during September. About 1% of the crop was lost due to late blight rot (C.H. Godwin). Late blight was first observed at Wedgeport, Yarmouth Co., N.S., on 16 July and at Scotts Bay, Kings Co., next day. The disease was general throughout the province but epidemics developed only in coastal areas where fog and cloudy weather prevailed for a period and resulted in some damage. Little or no loss occurred in the main potato-growing areas, where the potatoes were regularly sprayed (J.F. Hockey, R.C. Layton). Late blight was first observed on 22 July, a month earlier than in 1946, in Queens Co., P.E.I. This infection, which originated in a cull pile, spread and moderately affected 15 fields. Late blight was far less prevalent than in previous years due to the hot dry weather although it became quite severe in a few fields of Katahdin. Late blight rot was generally light, affecting up to 6% of the tubers in some lots of the late varieties. Its development was due to a slight late-season infection of the foliage and lifting the tubers while the tops were still partially green (L.C. Calbeck, S.G. Peppin).

LEAK (Pythium ultimum). Several reports were received in October of loss of tubers in storage or in transit from the Okanagan Valley, B.C. (G.E. Woolliams). The disease was observed in one lot of Green Mountain upon bin inspection at St. Roch des Aulnaies; 5% of the tubers were affected (B. Baribeau, A. Payette).

STALK ROT (Solerotinia solerotiorum) was destructive to 3 plants in a garden in Queens Co., P.E.I. (R.R. Hurst).

SILVER SCURF (Spondylocladium atrovirens) was observed in a few lots at bin inspection in Terrebonne, Labelle and Megantic Counties, Que., but the infection was slight (B. Baribeau). The disease was observed a few times during the fall shipping season in N.B. (C.H. Godwin). Very slight amounts of silver scurf were observed in N.S. (R.C. Layton). An occasional tuber was seen in a bin of Irish Cobbler in P.E.I. on 27 March (R.R. Hurst).

POWDERY SCAB (Spongospora subterranea) was found on White Rose grown on peat soil in the Cloverdale district, B.C., but it was much less severe than it was in the same district last year (P.D.S. 26,51) (H.S. MacLeod). The disease was found in a few lots only on bin inspection in the eastern districts of Que.; 8% of the tubers of Green Mountain were affected in one bin (B. Baribeau). Powdery scab was present in two lots in eastern N.B. (C.H. Godwin). A small area adjacent to some old buildings at the Potato Breeding Station, Alma, yielded severely scabbed tubers among seedlings resistant to common scab (J.L. Howatt).

WILT (Verticillium spp.) was reported in 31 fields and caused the rejection of one (7% infection) out of 579 inspected in N.S. Specimens from all affected fields were sent to the Kentville Laboratory for determination (R.C. Layton). This wilt was much more prevalent in P.E.I. this year than last; it caused the rejection of 1.8% of the fields entered (S.G. Peppin).

LATE LEAF ROLL (virus). During late August before aphids arrived in one of the propogating plots of the Laboratory in York Co., N.B., the varieties Katahdin, Irish Cobbler, Sebago, and Bliss Triumph showed a severe rolling of the leaves and reddening of the stems, petioles, and leaflets in the upper and middle sections of the tops. The percentage of plants affected was: Katahdin 65%, Irish Cobbler and Sebago 35% and Bliss Triumph 18%. The rolling symptoms resembled the current season's symptoms of leaf roll (Solanum virus 14) and they persisted until the vines died down. Affected plants matured earlier than those which did not show the condition. Scions from affected plants of each variety were cleft-grafted to tomato. In 21-30 days the tomato developed a moderate rolling of leaves, stiffening of the petioles and leaflets and a reddening of the veins. The affected plants were dwarfed and tended to mature early, the symtoms persisting until the tomato matured. Scions from the infected tomatoes were cleft-grafted to tomato and potato (Katahdin) in which plants the rolling symptoms were again produced. Symptoms produced by this virus in tomato are more pronounced than those caused by Solanum virus 14 and less pronounced than those produced by the bunch top virus. These findings seem to indicate the existence of another virus causing a type of leaf roll in potato. The disease is apparently not aphid transmitted because it made its appearance before these insects were present in the plot and all efforts thus far to transmit the disease from tomato to tomato and potato by means of Myzus persicae have been unsuccessful. This late developing leaf roll was also observed in commercial fields of Katahdin, Irish Cobbler and Bliss Triumph. A similar type of leaf roll was found in Green Mountain, the only difference being that the stems, petioles, and leaves showed a yellow instead of a red coloration. No symptoms were found in the tubers from plants showing the late leaf roll (D.J. MacLeod).

LEAF ROLL (virus) was found in 238 (32.3%) of the fields inspected in B.C., but in 229 not over 1% of the plants were affected; 4 fields were rejected (H.S. MacLeod). Leaf roll was present in 73 (38.5%) of the fields inspected in Alta., but no field contained more than 0.6% (J.W. Marritt). Infection was slight to moderate in commercial plantings at Edmonton (J.D.G.). Leaf roll caused the rejection of one field in Sask. It was more common in Irish Cobbler than in other varieties; 12% of the plants were affected in one field of this variety at Lumsden (A. Charlebois). Leaf roll was severe in some gardens in Sask. (R.J. Ledingham). Traces of leaf roll were seen in Man. and northwestern Ont. (D.J. Petty). One field of Sebago was rejected on account of leaf roll in southwestern Ont. (F.J. Hudson). This disease is one of the most important in Crop District 2, possibly on account of the popularity of Chippewa and Sebago; 18 fields were rejected (W.L.S. Kemp). Although leaf roll is present in nearly every variety in Crop District 3 it is most prevalent in Irish Cobbler, Warba, Chippewa and Sebago; 18 fields were rejected. Fields planted with seed brought south from the Cochrane district was considerably freer from leaf roll than seed in use previously (H.W. Whiteside). Three of the 52 fields inspected in eastern Ont. were rejected on account of leaf roll (O.W. Lachaine). Little leaf roll was present in Que. this year; in 1947 only 1.2% of the fields inspected were rejected for leaf roll (B. Baribeau). Only 47 fields were rejected for leaf roll in 1947 in N.B. in contrast with 489 in 1946. In the fields rejected only 1 field showed 9% infection whereas all others showed less than 5% (C.H. Godwin). Leaf roll was also light in N.S. in 1947 (R.C. Layton). It was likewise less prevalent in P.E.I. (S.G. Peppin).

LEAF ROLLING MOSAIC (Solanum virus 11). A trace was found in a field of table stock of Green Mountain in York Co., N.B. (D.J. MacLeod).

LEAF STREAK (Solanum virus 1, N strain). A trace was found in Katahdin, Chippewa, Sequoia and Earlaine in fields in York Co., N.B. (D.J. MacLeod).

MILD MOSAIC (Solanum virus 1, S strain). A trace was observed in 3 commercial fields of Katahdin in York County, N.B. (D.J. MacLeod).

MILD MOSAIC (Solanum virus 3) ranged from a trace to 8% in table stock fields of Green Mountain in York, Sunbury, Carleton, Victoria, and Westmorland Counties, N.B. (D.J. MacLeod).

MILD MOSAIC (Solanum virus 11) ranged from a trace to 3% in table stock fields of Irish Cobbler in Sunbury and Carleton Counties, N.B. This virus causes leaf rolling mosaic (q.v.) in Green Mountain (D.J. MacLeod).

MOSAIC (virus) was recorded as follows: In 280 (38%) of the fields inspected in B.C. and caused rejection of only 11 (H.S. MacLeod); small percentages found in 11 of 197 fields inspected in Alta. (J.W. Marritt); small amounts present in many fields in Sask. (A. Charlebois); only traces in Man. and northwestern Ont. (D.J. Petty); usually only small amounts of mosaic in Ont., but some fields of Green Mountain with a very mild mosaic were rejected in District 3 (H.W. Whiteside); less prevalent this year in Que., only 13 fields out of 904 being rejected for mosaic (B. Baribeau); more fields of Katahdin affected in N.B. than formerly, the cool weather during July probably favouring symptom expression (C.H. Godwin); only one field rejected in N.S. (R.C. Layton); more prevalent in P.E.I. than in 1946, 4.2% of the fields inspected being rejected for mosaic (S.G. Peppin).

RUGOSE MOSAIC (Solanum viruses 1 and 2). A trace was found in table stock fields of Green Mountain, Irish Cobbler, Earlaine, Katahdin, Chippewa, and Houma in York, Sunbury, Carleton, and Victoria Counties, N.B. (D.J. MacLeod).

PURPLE DWARF or HAYWIRE (virus). Not over 0.5% of the plants were affected in any of the 31 fields in which the disease was found in Alta. (J.W. Marritt). A trace of haywire was found in White Rose and five seedlings grown under field conditions in N.B. When scions from these potatoes were cleft-grafted to Lycopersicon esculentum, Datura Stramonium, Nicotiana Tabacum and N. rustica, symptoms were produced in these hosts similar to those caused by the bunch-top virus. It would appear that haywire and bunch-top have a virus in common or are caused by closely related viruses. Material of Canus and Early Epicure affected by haywire from Alta. were also found with a virus similar to the bunch-top virus present in Eastern Canada (D.J. MacLeod).

PURPLE or BUNCH TOP (virus) was seen in only 2 fields in southern Alta. in 1947; the disease was, therefore, much less prevalent than in previous years (J.W. Marritt). Purple top affected 80% of the plants in one field, 4-7% in 3 and under 3% in several other fields in Man.; infection did not exceed 3% in northwestern Ont. (D.J. Petty). Purple top was less common than last year in southwestern Ont., only an occasional plant being affected (F.J. Hudson). Only a few hills were affected in 3-4 widely scattered areas in District 2 (W.L.S. Kemp). Small amounts of purple top occurred in almost every field of Katahdin, Chippewa and Sebago in District 3 (H.W. Whiteside). A few plants were seen in one field in eastern Ont. (O.W. Lachaine). Purple top was less prevalent than in the previous year in N.B., particularly in Sebago and Katahdin (C.H. Godwin). Traces were present in N.S. in only 14 fields, mostly of Sebago and Katahdin (R.C. Layton). Purple top affected a trace to 5% of the plants in table stock fields in P.E.I. (R.R. Hurst).

Bunch top was general in potato fields in York, Sunbury, Carleton, Victoria and Westmorland Counties, N.B. Infection ranged from a trace to 3% and was present in Green Mountain, Irish Cobbler, Bliss Triumph, Katahdin, Netted Gem, Sebago, Houma, Chippewa, and 7 new seedlings. The bunch-top virus was transmitted by grafting to Nicotiana Tabacum, N. rustica, N. glutinosa, Datura Stramonium, Lycopersicon esculentum and potato (Green Mountain, Katahdin, and Sebago). The virus was found in combination with Solanum virus 14 (leaf roll) in Katahdin, Irish Cobbler, Green Mountain and Netted Gem. In the last three named varieties, the combined viruses gave rise to a net necrosis and spindling sprout in the tubers. The leaf-roll virus alone did not produce typical net necrosis and spindling sprout in these varieties of potato. The bunch-top virus alone gave rise to spindling sprout but failed to produce net necrosis. These findings seem to indicate that the net necrosis symptom is due to the combined effects of the two viruses and that spindling sprout is a symptom of the bunch-top virus (D.J. MacLeod).

SPINDLE TUBER (virus). Found in 2 fields in southern Alta. (J.W. Marritt); in one seed stock showing up to 10% spindle tuber used in planting 2 fields in Man. and 3 in the Rainy River district in Ont. (D.J. Petty); a trace in fields in central and eastern Ont. (W.L.S. Kemp); less prevalent in District 3 in 1947, and mostly in Sebago (H.W. Whiteside); not reported in the field in Que., but a few off-shape tubers seen on bin inspection (B. Baribeau); tubers found in very small numbers in all varieties in N.B. (C.H. Godwin); a few off-shape tubers on bin inspection in N.S. (R.C. Layton); much less prevalent in Sebago than in 1946 in P.E.I.; tuber unit indexing and careful inspection late in the season should keep it well in check (S.G. Peppin); traces only in 15 table stock fields of Sebago and Irish Cobbler in Queens and Prince Counties (R.R. Hurst).

WITCHES' BROOM (virus). In one 14-acre field of White Rose in the Cariboo district, B.C., 15% of the tuber units were affected with witches' broom. The seed used was grown in the Cariboo district and contained less than 1% of affected plants before the field was rogued in 1946. As the disease affected entire units spread must have occurred last year in the seed plot (N.S. Wright). Witches' broom was more prevalent and more severe in fields entered for certification in B.C. in 1947 than in previous years. It was found in 213 (29%) of the fields inspected and caused the rejection of 7 fields in 1947 compared with its occurrence in 11.6% in 1946 and 8% in

1945 and no fields rejected in either year (H.S. MacLeod). Witches' broom was found in 16 (8.1%) of the fields inspected in Alta. (J.W. Marritt).

Witches' broom was found in commercial potato fields in York and Carleton Counties, N.B., in the following varieties: Green Mountain (1 plant), Irish Cobbler (2), White Rose (1), Bliss Triumph (2). Two scions from each infected plant were cleft-grafted to tomato (Bonny Best). The virus was transmitted in each case giving rise to the typical symptoms of witches' broom in tomato, which is a good host for the characteristic and distinct expression of the disease symptoms (D.J. MacLeod).

YELLOW DWARF (virus) was observed in several fields in District 3, Ont., but only a few plants were affected in each (H.W. Whiteside).

BLACK HEART (non-parasitic) severely affected several barrels of Katahdin stored close to a furnace at Storrs Point, N.S. Tubers sproutly excessively, wilted and turned black. Three cases were brought in for ring rot examination in the spring. In a crop from a 11-acre field harvested when the weather was wet and piled deeply into bins at Hillarton, the centres of the piles were affected (K.A. Harrison). Two affected tubers were brought in for examination from Queens Co., P.E.I. (R.R. Hurst).

FERTILIZER INJURY. In a field in Champlain Co., Que., 5% of the sets were destroyed through injury from fertilizer (B. Baribeau).

FROST INJURY. Samples of Netted Gem brought to the Laboratory, Saskatoon, Sask., in March 1947, were found affected by field frost, a diagnosis confirmed by G.B. Sanford. The potatoes were probably stored after harvest under conditions favourable for cork formation. Bacterial break-down did not progress far before the frosted tissues dried up leaving externally visible depressions and small cavities in the flesh (R.J. Ledingham). Potato vines remained green in most sections of Sask., until severe local frosts caused considerable damage to the tubers in late September (A. Charlebois). Severe frost in September caused at least 10% loss in District 2 in Ont. Rain had removed the soil over the plants allowing the tubers at or near the surface, particularly in fields of Katahdin, to be injured by frost (W.L.S. Kemp). A heavy frost on 24 Sept. in Que., blackened the tops and injured the tubers near the surface. The loss was 4-8% of the crop (B. Baribeau). Only a few very late fields suffered frost damage in N.S. (R.C. Layton). Field frost caused 10% damage in a field in Prince Co., P.E.I. (G.W. Ayers).

FUMIGATION INJURY (chloropicrin) caused severe injury to several bags of seed potatoes in a warehouse at London, Ont. Sunken areas appeared about the lenticels and the eyes were killed (H.N. Racicot).

GIANT HILL was reported in 106 (14.4%) of the fields examined in 1947 in B.C. (H.S. MacLeod); in 6 fields (3.0%) in Alta. (J.W. Marritt); and in a few fields in District 2, Ont. (W.L.S. Kemp); not prevalent in Que. in 1947 (B. Baribeau); present in a few fields of Green Mountain in N.B. (C.H. Godwin); trace in 2 fields of Green Mountain in N.S. (R.C. Layton).

HOLLOW HEART (non-parasitic) affected 2% of the tubers in a lot of Katahdin table stock in L'Assomption Co., Que. (B. Baribeau). Hollow heart was more prevalent than usual in N.B. due to favourable growing conditions in September (C.H. Godwin).

LIGHTNING INJURY was observed in 2 fields in Kamouraska Co., Que.; the affected areas did not exceed 30 sq. ft. (B. Baribeau). Lightning caused severe damage to a field of Green Mountain at Hunter River, P.E.I. (R.R. Hurst).

NET NECROSIS does not appear to be as prevalent or severe in B.C. this year as in 1946; only 3 of the crops so far inspected were rejected for net necrosis (H.S. MacLeod). This condition is not as severe as it was in previous years in N.B.; only a trace was reported in Green Mountain during bin inspection in the fall (C.H. Godwin).

RHUBARB

LEAF SPOT (Ascochyta Rhei). Infection was severe in one garden at Edmonton, Alta. (M.W. Cormack).

LEAF SPOT (Ramularia Rhei) was found on a specimen received from Shipman, Sask. (P.M. Simmonds, D.B.O. Savile).

CROWN ROT (cause unknown) was prevalent in Sask. in 1947; damage was severe in some plantings (R.J. Ledingham).

SALSIFY

WHITE RUST (Cystopus cubicus) was present, although not severe, on nearly every plant at the Botanical Garden, Montreal, Que. (J.E. Jacques).

SPINACH

MOSAIC (virus). An occasional plant was affected in a garden in Queens Co., P.E.I. (R.R. Hurst).

SQUASH

YELLOWS (virus) affected 2% of the plants in a commercial field in Sunbury Co., N.B. (D.J. MacLeod).

SWEET CORN

BACTERIAL EAR and KERNEL ROT, caused by an undetermined bacterium, was severe at Edmonton, Alta. (A.W. Henry, L.E. Tyner).

EAR ROT (Diplodia Zeae) was found affecting a few ears in a garden plot at Beaumont, Que. (R.O. Lachance).

SMUT (Ustilago Maydis) was reported as follows: affected specimens received from Speers and Saskatoon, Sask. (T.C. Vanterpool); less infection than usual in fields examined this year in Ont. (J.K. Richardson); affected specimens received from Overbrook (H.N. Racicot); traces at the Botanical Garden, Montreal, (J.E. Jacques), and St. Pascal, Que. (R.O. Lachance); diseased specimens from Cambridge, N.S. (K.A. Harrison).

SWISS CHARD

LEAF SPOT (Ramularia beticola). Slight infection was present in 2 gardens located at Gordon Head and Victoria, B.C., in 1946 (W. Jones).

TOBACCO

Dr. L.W. Koch has prepared the summary of tobacco diseases in Ont. and Que. given below.

Diseases in the Seedbed

BLUE MOULD (Peronospora tabacina) was the most destructive disease of tobacco seedlings in Ont. in 1947. The earliest cases reported both in Essex and Norfolk Counties strongly indicated overwintering of the causal organism. Also, in each of these cases the presence of weeds within the area of the initial outbreak always at the edge of a bed indicated imperfect steaming. Blue mould occurred this year more than a week earlier than in any year since its appearance in Ont. During June the disease reached epidemic proportions in Essex Co., and during the latter half of the month it also became widespread in the new tobacco belt. Damage in the latter area was mild because more than 90% of the growers in this district sprayed their seedlings with Fermate. A few used bismuth subsalicylate.

Attempts by growers to control blue mould in glass-covered seedbeds by periodically raising the temperature above 100°F. for 4 hours per treatment again failed to check effectively the disease. In Essex Co. some growers who delayed spraying until after the disease appeared in their seedbeds lost all their plants. Blue mould has not yet appeared in the tobacco-growing districts of Que.

YELLOW PATCH (excessive nutrients) caused less damage than usual in Ont. Certain severe cases were reported or observed in Essex Co. but in the majority of seedbeds in both the old and new tobacco belts yellow patch was mild and the beds soon recovered.

DAMPING-OFF (Pythium sp., Rhizoctonia sp., etc.) was responsible for considerable re-seeding in Kent and Essex Counties, Ont., particularly in outside, cotton-covered beds. In the affected beds the fungi attacked the seedlings either before or soon after they emerged. In glass-covered seedbeds which were regularly sprayed with Fermate damping-off was of no importance.

MUSHROOMS caused mild to severe damage in many seedbeds in Kent Co., Ont. Materials, particularly the manure, used in seedbed construction appeared to have an important bearing on this trouble. In Essex Co. and other tobacco-growing areas these fungi are of no consequence.

2,4-D (Dichlorophenoxyacetic acid) INJURY. At least a dozen cases of 2,4-D injury were identified in the dark tobacco area around Blenheim, Ont. Affected plants had drooping, narrow leaves, more or less strap-shaped, with very prominent veins, wavy or deeply-toothed leaf margins and with a blistered surface in some cases. Usually the malformation was confined to certain sets of leaves. Symptoms resembled those of a virus infection except for the fact that when examined at intervals subsequent to damage, youngest leaves were found to be normal in appearance. Mild leaf symptoms were always followed by recovery, but sometimes root symptoms were observed long afterwards in the field. Affected roots bore clusters of closely-spaced, thickened, short rootlets.

Investigation indicated that the damage resulted from the use of contaminated knapsack sprayers in blue mould control. The sprayers had been used previously, in some cases the previous year, for spraying weeds and still contained sufficient traces of the herbicide to damage the tobacco.

BLACK ROOT ROT (Thielaviopsis basicola) was observed in a few seedbeds in Que.

SORE SHIN (Rhizoctonia Solani). A few cases were reported in Que.

Diseases in the Field

BLUE MOULD (Peronospora tabacina) caused considerable damage in the field during June and July both in the old and new tobacco belts of Ont. The disease spread even to the uppermost leaves in some fields and resulted in necrotic spots up to one inch in diameter. Infection proved most severe in fields or parts of fields with poor air drainage.

BROWN ROOT ROT (cause undetermined) was injurious in the old tobacco belt of Ont. mainly to Harrow Velvet and Halley's Special when these varieties followed corn in the rotation. In the Laboratory plots the disease was most severe where nutrient levels were below optimum. Brown root rot was reported from a field of burley tobacco at Cazaville, Que.

BLACK ROOT ROT (Thielaviopsis basicola) caused some damage in the dark tobacco area around Blenheim and in the poorly-drained fields in the flue-cured belt of Norfolk Co., Ont. Overall damage was less extensive than in the previous year, probably because of the excessive heat and drought in July and August.

Black root rot was severe on cigar varieties throughout the southern section of the tobacco area in Que. Apparently conditions were favourable in this area during the early part of the growing season when moisture was excessive and low temperatures prevailed.

MOSAIC (virus) was of minor importance in Ont. in 1947. During the latter part of the season cucumber mosaic caused mild damage in certain burley crops in Essex and Kent Counties. Some mild cases of mosaic were present in Que.

RING SPOT (virus) occurred in mild form in some fields of burley tobacco around Blenheim, Ont.

FRENCHING (cause undetermined) was observed in both the old and new tobacco belts of Ont. The disease was present only in poorly-drained areas, sometimes affected plants occurring in groups composed of up to 50 plants. More often, however, the plants were scattered, usually occurring singly.

SORE SHIN (Rhizoctonia Solani) caused moderate damage in certain fields of flue tobacco in Essex Co., Ont. As usual, damage was not apparent until plants which were bent or broken over as a result of high winds were closely examined.

LEAF SPOT (physiological) was destructive late in the growing season in many fields of flue-cured tobacco in Norfolk County, Ont. This disease also caused considerable damage to flue tobacco in Quebec.

Other Observations

MOSAIC (virus) again was noticed in Que., in fields where crop rotation was not practiced, but it was much more prevalent than in 1946, infection varying from 5 to 50%. Frequent rains during the planting season and in June and July necessitated more and later cultivation and bracing than usual; this extra handling may have spread the virus (F. Godbout). In a planting at the Laboratory, Fredericton, N.B., 1% of the plants showed severe symptoms of mosaic (Nicotiana virus 1) (D.J. MacLeod).

TOMATO

EARLY BLIGHT (Alternaria Solani) was recorded as follows: heavy infection mostly on the lower leaves late in the season at Point Grey and Agassiz, B.C. (I.C. MacSwan); infection light to moderate in all varieties at the Station, Lacombe, and slight on Early Chatham and Lethbridge 3700 at Beaverlodge, Alta. (J.D.G.); infection severe in many fields of early tomatoes in the Leamington district, Ont.; in several fields considerable defoliation (caused by both A. Solani and Septoria Lycopersici) before much of the crop was harvested; the collar blight phase caused a rot of 2% of the late tomato seedlings in plant beds at Cottam (C.D. McKeen); general again this year in Lincoln Co., but caused appreciable loss in only a few fields (J.K. Richardson). Early blight was present in plantings in Victoria, Carleton, York and Sunbury Counties, N.B., where it caused slight to moderate damage to the foliage. In general the disease was more prevalent than usual and it was not satisfactorily controlled by the common copper dusts (J.L. Howatt). All the plants of several standard varieties were affected by leaf spot and 15% showed stem or petiole lesions in a planting at Hantsport, N.S.; the plants had just been set out. A light general infection was noticed late in the season at Kentville (K.A. Harrison).

NAIL-HEAD SPOT (Alternaria tomato). A slight infection occurred in a small garden at Ottawa, Ont., late in the season (L.T. Richardson).

GREY MOULD (Botrytis cinerea) was causing a stem rot of plants received from Edson, Alta. (J.D.G.). The fungus was fruiting abundantly on the fruit-bearing pedicels, causing slight damage in a field of early tomatoes at Kingsville, Ont. (C.D. McKeen).

LEAF MOULD (Cladosporium fulvum). Infection was moderate in a greenhouse at Edmonton, Alta. (J.D.G.). Variety V121 was heavily attacked by leaf mould in most greenhouses in the Leamington district, Ont., in October 1947. Due to extensive killing of the foliage the late fruits would not be marketable. V473 was still free from mould on 30 Oct. C. fulvum was also found fruiting on the foliage of Bounty in two fields at Kingsville in July (C.D. McKeen). Leaf mould was so severe in a full crop in a range of 3 large greenhouses at St. Catharines that over half the leaves had fallen by mid-November when cropping was well underway; in addition some of the fruits were also infected (J.K. Richardson). D.L. Bailey (Phytopathology 38:2. 1948), in discussing physiologic specialization of C. fulvum, offers evidence "that the evolution in virulence encountered in C. fulvum has been a function of the increasing resistance of the host varieties to which it has been exposed".

ANTHRACNOSE (Colletotrichum phomoides). A few ripe fruits were infected in a plot of late tomatoes at the Station, Harrow, Ont. (C.D. McKeen). Anthracnose developed on a few fruits placed in storage near Ottawa, Ont. (L.T. Richardson).

BACTERIAL CANKER (Corynebacterium michiganense) affected the plants in a small home planting at Summerland, B.C., in July. It was also noticed in the field on tomato fruits bearing scabby spots; the pathogen was isolated (G.E. Woolliams). The disease again caused damage in the University plots, Fort Garry, Man. (W.A.F. Hagborg).

LATE BLIGHT (Phytophthora infestans) affected a few plants and fruit at the Farm, Agassiz, B.C. (W. Jones). Late blight was again very prevalent in the tomato growing areas of Ont., in 1947. It did not appear, however, until quite late in the season, about the time of the first picking. It spread very rapidly and in many instances caused severe loss. It was observed that the disease was worse in fields with poor air drainage or with a heavy crop of weeds. Very heavy applications of nitrogenous fertilizers also appeared to increase susceptibility of the plants to late blight (J.E. Howitt). Late blight was first reported on tomatoes in Durham and Prince Edward Counties on 7 Aug. and in Northumberland Co. on 11 Aug. Latterly it spread southwest and northeast becoming widespread during the first two weeks of September. The disease became particularly destructive in the important tomato-growing areas along Lake Ontario (T.L. Conners).

Late blight was widespread in Lincoln Co.; scarcely a planting escaped infection and upwards of half the crop was ruined. In one greenhouse in October considerable fruit rot developed while the crop was still green (J.K. Richardson). In an acre field of late tomatoes near Harrow, defoliation was severe and 50% of the crop rotted at one end of the field. In a 7-acre field only 50 yards away late blight was absent. Diseased fruit were received from a greenhouse at Leamington on 28 Oct. (C.D. McKeen). On 6 Sept. late blight appeared on the leaves of plants in the check plots of a spraying experiment at St. Martin, Laval Co., Que. A week later it had spread to the other plots and appeared on the fruits. By 21 Sept., 20-30% of the fruit were rotted. A nearby potato field was heavily blighted (E. Lavallee). Late blight caused little damage to tomato vines or fruits in N.B. because the disease was late in developing. Stored green fruit, however, showed considerable rot even when from sprayed plantings (J.L. Howatt). Late blight was not seen on the foliage, but 50% of the green fruit placed in storage from a small garden at Kentville, N.S., rotted (K.A. Harrison). A trace of late blight was seen on one planting in Queens Co., P.E.I. (R.R. Hurst).

FRUIT ROT (Phytophthora sp.) was found affecting fruit received from Westview, B.C. It was stated that nearly every plant, including the cherry tomato, was affected (G.E. Woolliams).

STEM and FRUIT ROT (Phytophthora parasitica). Following an epidemic in 1946 canker reappeared in the fall crop in the greenhouse at Belle River, Ont. In one house 20% of the transplants were lost and in the others an occasional plant died until the plants were 3-4 ft. high (C.D. McKeen). About 5% of the full-grown plants carrying a ripening crop were wilting in a greenhouse at Colborne on July 16. P. parasitica was isolated from the stems and also from seedlings grown in soil brought back to the Laboratory. Some 75% of the seedlings damped off (J.K. Richardson).

BACTERIAL SPECK (Pseudomonas tomato). In one 4-acre field of early tomatoes at Harrow, Ont., 60% of the fruits were affected by bacterial speck (C.D. McKeen, W.A.F. Hagborg).

STEM ROT (Sclerotinia sclerotiorum) was found affecting a plant received from a greenhouse at Banff, Alta. (L.E. Tyner). Stem rot was found affecting a few plants in every tomato field in Essex Co., Ont.

Rate of infection varied from a trace to 7%. The cankers usually reached 6-8 in. above the ground and sclerotia were formed in abundance inside the stem (C.D. McKeen).

LEAF SPOT (Septoria Lycopersici) appeared early in the season and caused considerable defoliation in early tomato fields in Essex Co., Ont. (C.D. McKeen). Leaf spot was present in most fields of canning tomatoes in Lincoln Co., but in only two fields did it cause severe defoliation and reduction of crop (J.K. Richardson). Leaf spot caused some defoliation in many tomato fields about St. Martin, Laval Co., Que., in late August and early September (E. Lavallee). Leaf spot caused slight to severe defoliation in two plots at the Station, Fredericton, N.B. (J.L. Howatt).

VERTICILLIUM WILT (V. albo-atrum) was found in both field and greenhouse crops of tomatoes in several parts of the Okanagan Valley from Vernon to Osoyoos as well as at Lillooet. Infection ranged from a trace to 75% of the plants (G.E. Woolliams).

BACTERIAL BLIGHT (Xanthomonas vesicatoria). A heavy infection was seen on one plant in a garden at Charlottetown, P.E.I. This record is the first for P.E.I. (R.R. Hurst).

BUNCHY TOP (Lycopersicum virus 6). Two affected plants of Table Talk were found in a garden at Fredericton, N.B. The characteristic symptoms of bunchy top are a severe dwarfing, distortion, and necrosis of the stems and leaves. The fruits are extremely small and contain few or no seeds. The virus was transmitted by grafting to Nicotiana Tabacum, Nicandra physaloides, Nicotiana glutinosa, and Capsicum annuum. In N. Tabacum and Nicandra physaloides a slight dwarfing and distortion of the leaves occur. In Nicotiana glutinosa and C. annuum the virus was carried without visible symptoms (D.J. MacLeod).

LEAF STREAK (Solanum virus 1). Three plants in a garden at Fredericton, N.B., showed a severe leaf streak due to the N strain of Solanum virus 1 (D.J. MacLeod).

MOSAIC (virus). A small number of V121 plants was found affected in nearly every greenhouse in Essex Co., Ont. Some 80% of the transplants, which had been grown in a cold frame near a greenhouse at Kingsville, were also affected. About 10% of the Bounty plants were infected in a field of early tomatoes at Harrow (C.D. McKeen). In Lincoln Co., scarcely a planting was free from mosaic, infection varying from insignificant amounts to severe cases where the loss was considerable (J.K. Richardson).

PURPLE-TOP (virus) was found in 8 plants of Bonny Best, 6 of Globonnie and 2 of Bonton at the Station, Fredericton, N.B. The virus was transmitted by grafting to tomato (Bonny Best) and potato (Katahdin and Green Mountain). In the tomato a disease similar to that described in P.D.S. 23:77 was produced. In the potatoes the typical symptoms of bunch top were produced, indicating that bunch-top (purple top, yellow top) in potato and purple-top in tomato are caused by the same virus (D.J. MacLeod).

STREAK (virus). Over 75% of several thousand staked plants were severely affected in a planting of Harkness in Lincoln Co., Ont., and very few fruit were formed (J.K. Richardson). A trace of severe streak (Lycopersicum virus 1) was found in a garden in Fredericton, N.B. (D.J. MacLeod).

BLOSSOM-END ROT (non-parasitic) was common in Sask. particularly in plantings where moisture was very low (R.J. Ledingham). Blossom-end rot was so severe in many fields of early tomatoes in the Leamington district that the crop was almost a total loss. In the Harrow area the trouble was also very prevalent among the first maturing fruits of the late canning crop (C.D. McKeen). A few fruits were affected at the Botanical Garden, Montreal, Que., but losses were considerable in many home gardens in town (J.E. Jacques). A slight amount of blossom-end rot occurred in the plots, Ste. Anne de la Pocatiere (R.O. Lachance). Three cases of blossom end rot were submitted by local market gardeners at Fredericton, N.B. (J.L. Howatt). Fifteen cases of the trouble were received from local gardeners in Queens Co., P.E.I. (R.R. Hurst).

HORMONE INJURY. From 50 plants in a garden in the Montreal district, Que., only a dozen small fruits were produced due to the use, in excess, of a hormone sprayed on the plants to increase the set of fruit (H.N. Racicot).

SKIN CRACKING (non-parasitic) was present on green fruits toward the end of September in most greenhouses in Essex Co., Ont.; all affected fruits were unsalable due to the widening of the cracks as the fruit ripened (C.D. McKeen).

SPRAY INJURY. Leaves of plants sprayed with Dithane at the recommended concentration at Fredericton, N.B., were mottled and showed a fern-like distortion. This condition has also been reported in Florida (J.L. Howatt).

SUN SCALD (non-parasitic). Affected fruits were received through the Scott Station from Adanac, Sask. (W.A.F. Hagborg); one of 6 fruits was affected in a sample from Grand Matis, Que. (H.N. Racicot).

TURNIP

POWDERY MILDEW (Erysiphe Polygoni) slightly infected Bangholm Swede turnips in the University plots, Vancouver, B.C. (I.C. MacSwan).

DOWNY MILDEW (Peronospora Brassicae). A light infection was reported with a specimen from a farmer in Queens Co., P.E.I. (R.R. Hurst).

BLACK LEG (Phoma lingam) was present in Ont., this year, but it was not as prevalent as in 1946 (J.D. MacLachlan). Traces were noted in a field of Laurentian Swede turnips in Queens Co., P.E.I.; the disease only becomes severe later in storage (R.R. Hurst).

CLUB ROOT (Plasmodiophora Brassicae). In 4 fields amounting to 10 acres, at Riviere des Prairies, Que., every turnip was affected and the crop was nearly a complete loss. Powdered cyanamid applied to plots 10 x 100 ft., at rates varying from 550 to 875 lb. per acre failed to prevent the development of the disease (R. Desmarteau).

BLACK ROT (Xanthomonas campestris) infected over half the plants in a 10-acre field of Laurentian at Uxbridge, Ont., and a high percentage of the roots will be unmarketable. Most of the infection was from the soil; it was learned that the grower was accustomed in recent years to feed his unmarketable turnips to livestock and to apply the manure to the land on which the next crop was to be grown (J.K. Richardson). An affected root was brought in by a local grower from Queens Co., P.E.I.; this case was the only one encountered (R.R. Hurst).

BACTERIAL BLIGHT (unidentified organism). An, as yet, unidentified bacterial blight first appeared early in September in the Walkerton district, Ont. It was most prevalent there, but later was found in several other nearby turnip areas. Symptoms resembled those of black rot, but no vascular blackening was evident. It appeared that infection was through the foliage and that aphids might be the carrier. The most striking symptoms on the foliage resulted from petiole infection; the petioles and leaf blades became chlorotic, wilted and died. In most cases all leaves on a plant except the small crown leaves were affected and the root stopped growing. In plants where the leaves were severely affected an orange or brown discoloration was evident about the vascular bundles in the neck and downwards into the cambial region of the root. Secondary soft-rot invaders attack the diseased crowns.

The disease also gave trouble after harvest. A few carloads were condemned upon arrival at their destination in the United States. Apparently mildly affected roots were included in the shipments and the disease developed rapidly under the wax.

An organism was readily isolated from the interior of the petioles and from the cambial region of the root. Its cultural characteristics indicated a close resemblance to Xanthomonas campestris. Further studies are being made by the Department of Bacteriology, Ont. Agr. College, Guelph (J.D. MacLachlan).

STERILITY (virus) was a trace in a seed plot of Swede turnips at the Station, Fredericton, N.B., and affected 1.5, 2.5 and 4% of the plants in 3 other seed plots in York and Sunbury Counties. Further investigation of the disease confirms its virus origin. The virus was transmitted by cleft grafting to Swede turnip, cabbage, turnip, wild radish, and broccoli. The typical sterility effect was produced in all these hosts (D.J. MacLeod).

WITCHES' BROOM (virus). Three affected plants were found in a seed plot at the Station, Fredericton, N.B., and two more in a commercial seed plot in York Co. (D.J. MacLeod).

BROWN HEART (boron deficiency) was not as severe as usual in Ont. (J.D. MacLachlan). It caused severe damage in a mussel-mudded field of Laurentian Swede turnips in Queens Co., P.E.I. In general, the disease was more prevalent than usual probably because the season was abnormally dry and hot (R.R. Hurst).

VEGETABLE MARROW

LEAF SPOT (Ascochyta Cucumeris Fautr. & Roum.). A slight infection was found at Agassiz, B.C., in 1946 (W. Jones). Examination of a specimen submitted by Jones revealed a fungus that agrees well with the description of A. Cucumeris given by W.B. Grove (Br. Stem & Leaf Fungi 1:300). The fungus was previously reported from B.C., as A. sp. (P.D.S. 23:79) (D.B.O. Savile).

MOSAIC (virus) affected 10% of the plants in a planting at the Station, L'Assomption, Que.; many of the fruits on the affected plants were aborted (L.T. Richardson).