III. DISEASES OF VEGETABLE AND FIELD CROPS

ASPARAGUS

RUST (Puccinia Asparagi). A trace was present on Mary Washington plants at the Station, Summerland, B.C. (G.E. Woolliams).

BEAN

GREY MOULD (Botrytis cinerea) caused considerable damage to leaves, flowers and pods of all bush varieties in the plots, University, Point Grey, B.C.; the summer was wet (H.N.W. Toms). Heavy infection occurred on wax beans in a garden at Charlottetown, P.E.I. (R.R. Hurst).

ANTHRACNOSE (Colletotrichum Lindemuthianum). Infection light on a few plants at Langley, B.C. (W. Jones); severe on the pods in the only affected lot examined at Summerland (G.E. Woolliams); severe in some garden plots at Edmonton, Alta. (J.D. Gilpatrick); affected specimens received from Ebenezer, Sask.--damage probably slight; anthracnose not found in Man. except in plots grown from infected seed (W.A.F. Hagborg). Damage was so severe in one field of Black Pencil Pod rejected for registration in Kent Co., Ont., that it was probably difficult to dispose of the crop in ordinary commercial channels; seed was secured from B.C. (A.A. Hildebrand). More prevalent than usual on snap beans about Guelph (J.D. MacLachlan). Slight damage in Lincoln Co., but disease less common than usual, occurring mostly where growth was luxuriant (J.K. Richardson). Anthracnose affected 25% of the plants of Brittle Wax in the plots at the Station, St. Martin, Laval Co., Que. Growers reported other cases with 5-10% loss in Montreal district (E. Lavallee). Severely diseased pods were received from Hudson Heights and Calumet (H.N. Racicot). Growers under contract to a local N.S. cannery reported severe loss from anthracnose in 1948. Specimens were received from several areas in Kings and Annapolis counties. In all cases the seed used was brought into N.S. and distributed by the cannery. The extremely wet season was favourable for the development and spread of the disease (D. Creelman). Varying amounts of anthracnose were noted on wax beans in Queens Co., P.E.I. (R.R. Hurst).

HALO BLIGHT (Pseudomonas phaseolicola) caused considerable damage to a seed crop of Stringless Green Pod at Metchosin, Vancouver Island, B.C. (W. Jones). Infection was heavy on Landreth's strain of Stringless Green Pod in both the test plots and the variety plots at University, Point Grey. (H.N.W. Toms). Halo blight affected less than 1% of the plants in a field of Tendergreen being grown for seed at Shuswap; it was found throughout the B.C. Interior on crops grown from diseased seed, but not on crops from healthy seed (G.E. Woolliams). The disease was absent to severe in variety plots of garden beans at Edmonton, Lacombe and Lethbridge, Alta., and trace to slight in 6 fields of field varieties at Lethbridge and Taber (M.W. Cormack, T.R. Davidson). Slight damage on several varieties at the Station, Scott, Sask. (H.W.M.). Halo blight was found in home gardens in Man. in various amounts, the more severeal infected yielding almost nothing. Field plantings grown under contract were almost free from infection and several fields were apparently disease free. The value of disease-free seed is becoming recognized by the contract companies (W.A.F. Hagborg). A moderate infection was found in Kings Co., N.S. (K.A. Harrison).

SCLEROTINIA WILT and ROT (S. sclerotiorum). Wilt was severe in part of a field of Michelite in Kent Co., Ont. (A.A. Hildebrand). Several deliveries to a cannery at Kentville, N.S. were affected by Sclerotinia rot. Where the beans could not be processed immediately, some lots were a complete loss. The season was wet (D. Creelman).

RUST (Uromyces appendiculatus) was reported in commercial fields in the Mission-Abbotsford area, Fraser Valley, B.C. (H.N.W. Toms). Plants were heavily infected by rust in a 30 ft. patch in a 2-acre field of Brittle Wax at Sherrington, Que. This is the first time that I have observed rust in the Montreal district (E. Lavallee). A light infection was observed in a field in Queens Co., N.B. (S.F. Clarkson). An affected specimen from a local garden was referred to the laboratory, Kentville, N.S. (D. Creelman). Traces were observed on wax beans in Queens Co., P.E.I. (R.R. Hurst).

COMMON BLIGHT (Xanthomonas phaseoli). Reported from a few city gardens, Saskatoon, Sask.; not a year for bacterial blight (T.C. Vanterpool). The disease affected 2% of the plants in an acre field of Corvette and 5% of the plants in a small plot of Stringless Green Pod in Carleton Co., Ont.; plots of 3 other varieties were disease free (V.R. Wallen). Out of 7 fields grown for seed and inspected at Sherrington and Ste. Philomene, Que., 5 were infected; average infection was about 5% (E. Lavallee). A moderate infection developed on Michelite and other varieties at the Station, Ste. Anne de la Pocatiere; damage was slight (A. Payette). A few affected plants were brought to the Laboratory, Charlottetown, P.E.I. (R.R. Hurst).

BACTERIAL BLIGHT (Common and Halo Blight). In most fields in N.B., infection was confined to the leaves, but in a field at Green Road, Carleton Co., both pod infection and joint rot were quite common over the entire field and severe in patches (S.F. Clarkson).

CURLY TOP (Beta virus 1). Slight infection in most plantings in the southern sections of the Okanagan Valley, B.C. (G.E. Woolliams).

MOSAIC (virus). Found occasionally in field beans in the B.C. Interior (G.E. Woolliams), slight infection in 2 fields at Taber, Alta., and in the Red Mexican variety at Lethbridge (M.W. Cormack). Present in most plantings in Lincoln Co., Ont., but losses appear negligible (J.K. Richardson). Moderate infection of Stringless Green Pod in a plot in Carleton Co., 3 other varieties not affected (V.R. Wallen). A trace of mosaic (Phaseolus virus 1) found in Giant Stringless Green Pod and White Marrowfat in a garden at Fredericton, N.B. (D.J. MacLeod). A trace of mosaic in a garden in Queens Co., P.E.I. (R.R. Hurst).

YELLOW MOSAIC (Phaseolus virus 2). About 2% of the plants of Kentucky Wonder in a garden at Fredericton, N.B., showed a well defined yellow mosaic. The source of the virus was traced to a mixed lot of gladiolus planted about 4 feet from the beans. When the virus obtained from the infected beans and the gladioli was transmitted by sap inoculation to healthy Phaseolus vulgaris and Vicia Faba the typical symptoms of Phaseolus virus 2 were produced. The gladioli showed a marked mottling of the leaves (D.J. MacLeod).

CHLOROSIS (high temperature of surface soil). Greening was retarded by several days in bean seedlings in city gardens, Saskatoon, Sask. High temperatures at the surface of the soil when the seedlings were emerging was believed to have upset the mechanism of chlorophyll development (T.C. Vanterpool).

BEET

LEAF SPOT (Cercospora beticola). A moderate infection was found on all beets examined, but rather heavy in one garden in Queens Co., P.E.I. (W.A. Hodgson, R.R. Hurst).

LEAF SPOT (Phoma Betae) was fairly prevalent on the lower leaves of a seed crop of Crosby Egyptian at Cobble Hill, B.C. (W. Jones).

LEAF SPOT (Ramularia beticola). Infection light on the lower leaves of all varieties in the test plots, University, Point Grey, B.C. (H.N.W. Toms). Infection general on beet stecklings grown for seed at North Saanich; fungus sporulating profusely on Oct. 22 (W. Jones).

SCAB (Streptomyces scabies (Thaxter) Waksman & Henrici). All beets grown in the plots at the Station, St. Martin, Que., were affected; the damage was considerable (E. Lavallee). A trace recorded on Detroit Dark Red in a garden at Kentville, N.S. (D. Creelman); and in a garden in Queens Co., P.E.I. (R.R. Hurst).

RUST (Uromyces Betae) was abundant and general on stecklings grown for seed at North Saanich, B.C. (W. Jones). Scattered infection in the plots, University, Point Grey (H.N.W. Toms).

BROWN HEART (boron deficiency). An occasional affected beet seen in Queens Co., P.E.I. (R.R. Hurst).

BROCCOLI

RING SPOT (Mycosphaerella brassicicola) was general on foliage of overwintered plants at the Station, Saanichton, B.C. (W. Jones).

CABBAGE

GREY LEAF SPOT (Alternaria Brassicae) moderately infected 15% of the plants in a 1/10 acre plot in Northumberland Co., Ont. One plant also affected by soft rot (Erwinia carotovora) (V.R. Wallen).

DOWNY MILDEW (Peronospora Brassicae). General infection on overwintered plants at the Station, Saanichton, B.C.; sporulating freely (W. Jones). Infection moderate on seedlings in ¼ acre field on Lulu Island (I.C. MacSwan); also on seedlings at Steveston and on mature plants in the plots, University, Point Grey, B.C. (H.N.W. Toms).

BLACK LEG (Phoma lingam). All plants affected in a small area of a field in Carleton Co., Ont. "Situation is getting quite alarming" according to C.E. Ste. Marie, Experimental Station, L'Assomption, Que., on a nearby farm, where is grown a large acreage of cauliflower, brussels sprouts, early and late cabbage (L.T. Richardson). A very light infection noted in a garden in Queens Co., P.E.I. (W.A. Hodgson).

CLUB ROOT (Plasmodiophora Brassicae). Scattered infection in the vegetable plots, University, Point Grey, B.C. (H.N.W. Toms). Infection was general and severe on cabbage and cauliflower in the western part of the Fraser Valley especially on delta lands. Crops set out from June on are more severely affected than those set out earlier (I.C. MacSwan). Cabbage fields in the Jesus and Montreal Islands are seldom found free of club root. Losses are very high in many fields. Also heavy on cauliflower (E. Lavallee). Light infection in a garden in Queens Co., P.E.I. (W.A. Hodgson).

WIRE STEM (Rhizoctonia Solani). Severely infected cabbage plants sent 21 June from Yellowknife, N.W.T. According to A. Hutchinson "Cauliflower plants were a complete loss, the flats appearing as if they had been blasted with a blow torch" (H.N. Racicot). Prevalent in hot beds of cabbage and cauliflower in Jesus Island, Laval Co., Que., and losses heavy. Fermate and Arasan are promising as soil disinfectants (1.5 grams per square foot well mixed with soil) (E. Lavallee).

BLACK ROT (Xanthomonas campestris) was severe in patches in a 3-acre field at St. Vital, Man. (W.A.F. Hagborg). About 25% of the plants died in an acre planting of late cabbage in Welland Co., Ont., others were dwarfed and in late October most plants showed some symptoms (J.K. Richardson). Black rot affected half of the plants in a field at Cote de Liesse, Que.; damage was 15% (E. Lavallee).

CARAWAY

YELLOWS (Callistephus virus 1) affected 4 plants in a garden at Fredericton, N.B. (D.J. MacLeod).

CARROT

CROWN GALL (Agrobacterium tumefaciens). A sparse infection in the vegetable plots, University, Point Grey, B.C. (H.N.W. Toms).

LEAF BLIGHT (Alternaria Dauci). A slight infection in the variety plots at Agassiz, B.C., and in the vegetable plots, University, Point Grey (H.N.W. Toms).

BLACK ROT (Alternaria radicina) caused extensive root decay in crops eing grown for seed at Grand Forks, B.C.; also some infection on a root crop t Summerland (G.E. Woolliams).

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

SOFT ROT (Erwinia carotovora) was extensive on roots of plants grown for seed at Grand Forks, B.C. (G.E. Woolliams).

SCLEROTINIA ROT (S. sclerotiorum) caused extensive losses among some overwintered root crops in the B.C. Interior (G.E. Woolliams). Trace infection found in plantings at Edmonton, Alta.; severe damage occurred in a storage cellar at Calgary in late November (M.W. Cormack).

BACTERIAL BLIGHT (Xanthomonas carotae). Infection was slight on crops being grown for seed at Grand Forks and Cawston, B.C. (G.E. Woolliams), and on the leaves of a root crop at Winnipeg, Man. (W.A.F. Hagborg).

YELLOWS (Callistephus virus 1) was found on some roots being grown as stecklings at Grand Forks, B.C. (G.E. Woolliams); slight infection in a field at Barnwell, Alta., and traces in plantings at Vermilion and Edmonton (T.R.D.); although the disease is still widespread in the Montreal district, Que., fields treated with oil for weeds were freer of the disease (E. Lavallee). Yellows was general on carrots in Carleton, York, Sunbury, Queens, and Westmorland Counties, N.B.; infection ranged from a trace to 20% (D.J. MacLeod, S.F. Clarkson). Traces to 30% of plants affected in many plantings in Queens Co., P.E.I. (R.R. Hurst).

DWARF (undetermined virus) described in P.D.S. 27:45-46, 1947, was found in fields in York, Carleton, Sunbury, Queens and Westmorland Counties, N.B.; infection was a trace to 17% (D.J. MacLeod).

CAULIFLOWER

BLACK STEM (Alternaria brassicicola (Schw.) Wiltshire = A. oleracea Milbr.) affected about 10% of the seedlings being grown in flats in a greenhouse at Elk Lake, B.C. (W. Jones).

BLIGHT (Alternaria ?tenuis) severely infected most of the heads of cauliflower in a planting at Ste. Anne de la Pocatiere, Que. No infection was observed on the leaves, but the blackening of the heads was striking (A. Payette).

RING SPOT (Mycosphaerella brassicicola). Slight infection on a few leaves of young plants in a cold frame at the Station, Saanichton, B.C. (W. Jones).

DOWNY MILDEW (Peronospora Brassicae). Numerous seedlings affected in cold frames at Elk Lake and the Station, Saanichton, B.C.; also rather severe on young plants in cold frames (W. Jones).

CLUB ROOT (Plasmodiophora Brassicae). A single specimen seen in a private garden at White Rock, B.C. (H.N.W. Toms). A small planting on low ground in Welland Co., Ont., showed severe clubbing; infection took place in the seedling flats (J.K. Richardson). See also under cabbage.

WIRE STEM (Rhizoctonia Solani). Two growers at Leamington, Ont., lost 20% of their plants after the first transplanting. The disease continued to destroy plants, but at a reduced rate, until they were set in the field. Most growers lost some plants from wire stem (C.D. McKeen).

BLACK ROT (Xanthomonas campestris) caused slight damage in commercial fields about Winnipeg, Man. (W.A.F. Hagborg). The disease again occurred in Lincoln Co., Ont., to a slight extent in 1948 after a severe outbreak in 1947 (J.K. Richardson).

WHIPTAIL (physiological). Three plantings were severely affected in Queens Co., N.B. (S.F. Clarkson).

CELERY

EARLY BLIGHT (Cercospora Apii) severely infected 3 plantings of ½ to 2 acres in extent in the Leamington area, Ont. Spraying was begun after much damage had been caused already to the foliage and stems (C.D. McKeen). Damage was less severe than in most years in Lincoln Co., except that several outbreaks occurred in crops under irrigation (J.K. Richardson). Two fields were heavily infected at St. Martin, Que.; loss was at least 30% (E. Lavallee).

SOFT ROT (Erwinia carotovora) severely affected 65% of the heads in a stored crop in Queens Co., P.E.I. (R.R. Hurst).

LATE BLIGHT (Septoria Apii-graveolentis). A heavy infection was observed on leaves and stalks in one 10 acre field at Cloverdale, B.C. (I.C. MacSwan); a sparse infection occurred in the vegetable plots at the University, Point Grey (H.N.W. Toms); the disease was quite general in the Armstrong district (G.E. Woolliams). The disease was found in a few plantings in the Leamington area, Ont., but frequent sprayings kept it under control; damage was slight (C.D. McKeen). One grower with a large acreage under irrigation had difficulty in keeping late blight under control in Lincoln Co. (J.K. Richardson). Found in about 10 fields in the Montreal district, Que.; 30-80% of the plants were affected and the loss was heavy in a few cases (E. Lavallee).

STEM CRACKING (boron deficiency). The entire crop was lost from heart rot and stem cracking on a farm in Russell Co., Ont. The plants were set out on soil with underlying limestone (H.N. Racicot).

CUCUMBER

LEAF SPOT (Alternaria sp.) infection was severe in a garden at Rosedale, B.C. (W. Jones). The Alternaria sp. is distinct from A. cucumerina on melon; it approaches A. tenuis but some spores are larger than those typical of the species. This leaf spot was severe on cucumbers about Maugerville, N.B., in 1946. According to the collector, S.F. Clarkson, the disease can be very destructive, actually killing the plant (I.L. Conners, D.B.O. Savile).

EGG-PLANT

WILT (Verticillium ?Dahliae) was found in several plantings in Essex Co., Ont., and affected up to 20% of the plants; moderate damage resulted (C.D. McKeen).

HOPS

DOWNY MILDEW (Pseudoperonospora Humuli) was prevalent in one commercial yard at Kamloops, B.C. Hitherto the district has been free of the disease but heavy rainfall favoured its development. At Sardis mildew was found attacking the cones of the Fuggles variety, which has proved in other seasons highly resistant. The disease caused considerable damage to the susceptible varieties Clusters and Golding in Fraser Valley yards (W. Jones).

LETTUCE

GREY MOULD (Botrytis cinerea) was widespread on the outer leaves of plants nearing maturity in the plots, University, Point Grey, B.C. (H.N.W. Toms).

DOWNY MILDEW (Bremia Lactucae). A moderate infection was present in a 10-acre field at Cloverdale, B.C.; both grey mould and downy mildew occurred on the lower leaves near the surface of the ground (I.C. MacSwan). Infection was heavy on 2" seedlings in a garden at Victoria during an unusually wet and cool summer (H.T. Gussow, D.B.O. Savile). Light infection on lower leaves of lettuce seed crop at Grand Forks (G.E. Woolliams).

RUST (Puccinia patruelis). A trace occurred on lettuce in a garden at Kapuskasing, Ont. (M.R. Wianoko, D.B.O. Savile).

DROP (Sclerotinia sclerotiorum) killed 16% of the plants in a garden at Cowichan, B.C. (W. Jones).

YELLOWS (Callistephus virus 1) affected 2% of the plants in a field in Sunbury Co., N.B. (D.J. MacLeod).

FERTILIZER INJURY (excess fertilizer) reduced the yield of lettuce being grown in a greenhouse near Ottawa, Ont. The fertilizer, 4-8-10, had been applied and worked into the soil. Plants were spindly and lighter green than normal with some leaves slightly twisted. The stems were much thickened and the fibrous roots were gnarled, thick and short (H.N. Racicot).

LEAF SPOT (unknown bacterium) was present on the lower leaves of all plants in a small seed planting at Grand Forks, B.C. (G.E. Woolliams).

TIP BURN (physiological) caused moderate damage to 2 fall crops of greenhouse lettuce at Leamington, Ont. (C.D. McKeen).

MELON

LEAF SPOT (Alternaria cucumerina). A light infection was observed in 2 fields at Leamington, Ont. (C.D. McKeen).

SCAB (Cladosporium cucumerinum) infection was variable and caused up to 30% loss in some fields in Essex Co., Ont. Most plants were affected in one 8-acre field at Leamington, Ont. The lesions were numerous and coalescing on the petioles and the ends of the vines in another 8-acre field at Kingsville; much of the terminal growth was dead before many fruits set (C.D. McKeen). A 90% infection in Carleton Co., caused the loss of half the crop (L.T. Richardson).

POWDERY MILDEW (Erysiphe Cichoracearum). As in 1947, the disease was again epidemic in the muskmelon areas in southern Essex Co., Ont.; extensive defoliation occurred in several fields shortly after harvesting began; losses varied from a trace to 50% (C.D. McKeen).

FUSARIUM WILT (F. bulbigenum var. niveum) was present in many melon fields in southern Essex Co., Ont. It was particularly severe in 7 fields where its existence was unknown previously. Losses were estimated to vary from 14 to 75% and averaged 42%. The variety Iroquois proved to be completely resistant when grown in heavily infected soil (C.D. McKeen).

MOSAIC (virus). All plantings were affected by mosaic in southern Essex Co., Ont. and in some 75% of the plants were infected with loss in yield up to 40% of the crop. Aphid population was high early in the season (C.D. McKeen).

ONION

BLIGHT (Botrytis Allii). Infection of seed heads and the scapes just below the heads caused much of the seed to be light, shrivelled and low in germination about Grand Forks and Vernon, B.C. (G.E. Woolliams).

NECK ROT (Botrytis Allii). Infected specimens were received from Vermilion, Alta. (A.W. Henry). In one 8-acre field of Spanish onions in Essex Co., Ont. 40% of the transplants were attacked and killed. The fungus penetrated the neck of the young plants about $\frac{1}{2}$ inch below the soil line. Wet weather and low temperatures in late May probably favoured the organism; plant growth was slow (C.D. McKeen).

WILT (Fusarium sp.) affected 1% of the plants in a garden at Victoria, B.C. (W. Jones).

BULB ROT (Fusarium sp.). Infection was moderate in a planting at Ste. Anne de la Pocatiere, Que.; loss was about 25% (R.O. Lachance).

DOWNY MILDEW (Peronospora destructor) appeared in epidemic form on all varieties grown commercially in the Okanagan Valley and the Grand Forks district, B.C., where it caused severe injury to both the seed and bulb crops. Cool damp weather with frequent rain was probably ideal for the development and spread of the disease (G.E. Woolliams). The disease

was also severe on both a seed and a bulb crop at the Station, Saanichton (W. Jones). Not only was the season very wet, but adequate protection measures are lacking (W.R. Foster). Affected specimens were received from King, Bowanville, Gads Hill Station, Arden, Napanee, Toronto and Islington, Ont. (J.D. MacLachlan).

BLACK LEAF SPOT (Pleospora herbarum (Stemphylium botryosum) was common on scapes of seed plants affected by downy mildew at the Station, Saanichton, B.C. (W. Jones).

PINK ROT (Pyrenochaeta terrestris (Hansen) Gorenz, Walker & Larson = Phoma terrestris Hanson). Affected specimens were found in several fields in the Leamington marsh, Ont. (C.D. McKeen). In a recent paper by A.M. Gorenz, J.C. Walker and R.H. Larson (Phytopathology 28:831-840. 1948, the pathogen is transferred to Pyrenochaeta (p.838).

SMUT (Urocystis Cepulae) is commonly found on one farm at St. Laurent, Que. (E. Lavallee).

YELLOW DWARF (virus). A trace was found in one seed crop of Ebenezer at Grand Forks, B.C. (G.E. Woolliams).

PARSLEY

LEAF SPOT (Septoria Petroselini). A light infection was observed on the lower leaves of a seed crop of Champion Moss Curled near Vancouver, B.C. (H.N.W. Toms).

PARSNIP

LEAF SPOT (Ramularia Pastinacae). Infection was a trace in a small garden planting at Kentville, N.S. (D. Creelman).

YELLOWS (Callistephus virus 1). A few plants were moderately affected in a field at Taber, Alta. (M.W. Cormack).

PEA

ROOT ROT (Aphanomyces euteiches Drechsler). On 9 July, a survey of some 500 acres of late maturing canning peas was made in Essex Co., Ont. About 95% of the acreage was so severely damaged by root rot that the crops were not harvested. It appeared that late seeding and high soil moisture followed by relatively high temperatures prior to blossoming favoured root rot development (C.D. McKeen, A.A. Hildebrand). This disease was fully described by F.R. Jones and Chas. Drechsler (J. Agr. Res. 30:293-325. 1925). At that time they considered this disease caused by A. euteiches the most important of the several root rot diseases described in the United States. It causes a rapid rotting of the cortex of the main root and epicotyl. This pathogen has not previously been recognized in Canada (I.L. Conners).

LEAF and POD SPOT (Ascochyta Pisi). Infection was moderate mostly on the leaves of seed crops of Stratagem and Giant Stride at the Station, Saanichton, B.C.; (W. Jones). Infection was light on the leaves in the well drained plots, University, Point Grey, and general in a sheltered private garden at Chilliwack (H.N.W. Toms). Infection was slight on some of the variety increase plots in the Armstrong district; the lower leaves were infected on scattered plants in a field of Lincoln at Taffin (G.E. Woolliams).

Most of the fields inspected in Alta. were crops grown for seed. They were sown with seed tested at the Edmonton laboratory and found to be practically free of disease. Two inspections were made in the Lethbridge and Brooks districts, one when the plants were in early flower to early pod stage and another at the full pod to ripe stage. Rainfall had been considerably above normal up to mid-July, but the rest of the season was exceptionally dry, with no further spread of disease.

Peas in the Beaverlodge district were exceptionally clean. In the Lacombe and Edmonton areas infection was slight with no severe damage reported. The results of the inspection are summarized in Table 3.

Table 3. Pea Diseases in Alberta in 1948

District	Fields Examined	Fields Diseased	Fields Infected by: Pseudomonas Pisi (1)	Pseudomonas Pisi (2)	Ascochyta Pisi (1)	Ascochyta Pisi (2)	S. Pisi (1)	Peronospora Pisi (1)	Erysiphe Polygoni (1)	Erysiphe Polygoni (2)
Lethbridge	10	10	9	1	8	0	0	7	3	0
Brooks	26	26	25	0	13	0	0	2	14	0
Lacombe	4	4	4	0	3	1	1	0	0	0
Edmonton	4	4	3	0	4	0	1	0	2	1
Beaverlodge	5	3	0	0	2	0	0	0	0	0
All Alberta	49	47	31	1	30	1	2	9	19	1

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

In the general survey in Alta. leaf and pod spot infection was a trace at Beaverlodge, Dawson Creek and Edmonton, moderate at Lacombe and moderate to severe at Lethbridge (S.G. Fushtey). A moderate infection by A. Pisi and A. pinodes was present in most fields in the Nipawin-Aylsham area, Sask.; one isolated field on new breaking was free from Ascochyta (H.W.M.). In a survey of 17 fields of field peas and 19 of garden peas in Man. 35 were infected by Ascochyta. Isolations were made from samples from 28 fields as follows: One collection each of field and garden peas yielded A. Pisi; 14 of field peas and 12 of garden peas yielded A. pinodes (W.A.F. Hagborg, E. Robertson). Leaf and pod infections were reported to be general on canning peas at Otterville, Ont.; specimens sent for examination (G.C. Chamberlain). All the late fields of canning peas were heavily infected in Essex Co. (C.D. McKeen). A trace only was observed in Queens Co., P.E.I. (R.R. Hurst).

POWDERY MILDEW (Erysiphe Polygoni). A slight infection was recorded on the foliage and pods of a seed crop at Saanichton, B.C.; the disease is uncommon in the coastal areas (W. Jones). Infection was slight to moderate in fields at Lethbridge and slight to severe at Edmonton, Alta. (S.G. Fushtey). Infection ranged from 20-80% and the damage from moderate to heavy in about 30 fields visited in South Gaspé Co., Que.; most fields were more or less severely infected (E. Lavallee). Infection was trace to heavy in Queens Co., P.E.I. (R.R. Hurst).

ROOT ROT (Fusarium spp.). Damage was slight in one garden at Saskatoon, Sask., and severe in gardens and experimental plots at Scott (H.W.M.). Isolations made from the base of plants of 2 varieties yielded F. oxysporum and those from a plant of Dashaway yielded F. Solani. As Mycosphaerella blight was prevalent in the same fields in Man., infection by Fusarium may have been secondary. No wilting was observed (W.A.F. Hagborg, W.L. Gordon).

Many specimens affected by Fusarium root rot were received from various parts of Ont. (J.D. MacLachlan). Infection was a trace to slight in a field of Arthur at Ste. Anne de la Pocatiere, Que. (R.O. Lachance).

WILT (Fusarium sp.). Damage was considerable in several gardens at Chemainus, B.C. (W. Jones).

MYCOSPHAERELLA BLIGHT (M. pinodes (Ascochyta pinodes) caused moderate to severe damage in the chief pea growing areas of Man. By mid-July infection was widespread although slight, but by 5 Aug. the disease was present on every plant in most fields and was causing premature ripening and blighting. Yield appeared to be markedly reduced. Of 36 fields examined under the Health Approval scheme, one or more of the designated diseases were present in every field. The results of isolations from affected material are reported above under Leaf & Pod Spot (W.A.F. Hagborg, E. Robertson).

DOWNY MILDEW (Peronospora Pisi). A few plants of Stratagem were severely affected at Sidney, B.C. (W. Jones). Infection trace to slight in 9 out of 36 fields examined in Alta. (see Table 3) (S.G. Fushtey). Found in a field of Lincoln peas at Birds Hill, Man. (W.A.F. Hagborg, E. Robertson).

LEAF SPOT (Pleospora herbarum (Stemphylium botryosum). Slight infection on Gradus at Cobble Hill, B.C.; sometimes associated with downy mildew infection (W. Jones).

BACTERIAL BLIGHT (Pseudomonas pisi). Infection was a trace in fields at Beaverlodge and Lacombe, Alta., trace to moderate at Edmonton and slight to moderate at Lethbridge (S.G. Fushtey). Infection was general but light in the Nipawin-Aylsham area, Sask. (H.W.M.). Bacterial blight was found in 12 of 17 fields of field peas and 4 of 19 fields of garden peas in Man. The disease failed to spread during the latter part of the season and only slight damage occurred. This mild attack was in contrast to 1946, when the disease continued to spread rapidly during the growing season and cause severe damage in some fields. Severe damage to canning peas was caused by bacterial blight in Prince Edward Co., Ont., according to information received from A.N.L. Butler, Vineland Station. In several instances the crop was abandoned (W.A.F. Hagborg).

LEAF SPOT (Septoria flagellifera) moderately affected garden peas at the Station, Melfort, Sask. (H.W.M.).

LEAF SPOT (Septoria Pisi) was recorded in 2 fields in Alta. (S.G. Fushtey). Infection was moderate in a garden at Saskatoon, Sask. (E.J. Hawn). Infection was severe in garden peas at Whitemouth, Man., and a trace at Birds Hill (W.A.F. Hagborg). Infection was about 5% in most plots of garden peas, at C.E.F., Ottawa, Ont. (V.R. Wallen).

RUST (Uromyces Fabae) was fairly general on Giant Stride, Lincoln and Stratagem at the Station, Saanichton, B.C., and infection was slight on 2 seed crops in the Saanich district (W. Jones). Infection was a trace to moderate on peas in Queens Co., P.E.I. (R.R. Hurst).

MOSAIC (virus) affected 5% of the plants in one seed crop at Saanichton, B.C. (W. Jones). A trace of mosaic (Pisum virus 1) was found in 2 gardens in Fredericton, N.B. (D.J. MacLeod).

MARSH SPOT (manganese deficiency). In a sample of pea seed received through Plant Products Division, Production Service, from Kinistine, Sask., about 12% of the seeds were characterized by internal necrosis typical of marsh spot. Of 200 seeds placed in moist sand and sawdust to germinate 169 produced normal and 20 abnormal seedlings; 8% of the normal and 45% of the abnormal had cotyledons which were necrotic at the centre (W.A.F. Hagborg, G. Warner, N.A. Phillips).

PEPPER

GREY MOULD (Botrytis cinerea). In the outdoor beds of a grower at Harrow, Ont., 6% of the pepper transplants were attacked in the region of the growing point. Attacked plants were rapidly killed and the fungus fruited abundantly on the dying tissues. Plants similarly attacked were received from other districts in southern Ont. (C.D. McKeen).

SOFT ROT (Erwinia carotovora). A few fruits were found infected in all plantings in Essex Co., Ont., in September. As in 1947, infected fruit had been attacked by corn borer larvae (C.D. McKeen).

LATE BLIGHT (Phytophthora infestans) affected about 50% of the fruits in the test plots, University, Point Grey, B.C. (H.N.W. Toms).

DAMPING OFF (Pythium sp. and Rhizoctinia Solani) was found in several greenhouses in the Huron district, Ont., but the loss of seedlings did not exceed 4% in any house. These small losses are in marked contrast with the heavy losses in previous years. The control of the disease in 1948 was obtained by treating the soil with Arasan prior to seeding (C.D. McKeen).

WILT (Verticillium Dahliae) was found on a few plants at the Station, Summerland, B.C. (G.E. Woolliams).

STUNT (virus). Less than 1% of the plants were affected in an 8-acre field in Essex Co., Ont. Affected plants showed a mild chlorosis with considerable dwarfing and rosetting (C.D. McKeen).

BLOSSOM-END ROT (non-parasitic). About 2% of the fruits in all pepper plantings were affected in Essex Co., Ont. (C.D. McKeen).

STUNTING (excess fertilizer). Severe stunting affected several hundred plants of a grower in Lincoln Co., Ont., early in the season. The trouble was diagnosed by soil analysis. After several good rains the condition was corrected and a good, rather late crop was produced (J.K. Richardson).

POTATO

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

The potato seed crop grown in 1948 was the largest ever produced. Not only the yields but the acreage planted were high. The percentage of crop passing inspection was, however, the second lowest passing inspection in the past five years. A large part of this decrease resulted from a further increase in the rejections due to mosaic, which has been very low since fields for certification have been planted with Foundation or Foundation A seed. This increase was especially noticeable in P.E.I. Rejections for ring rot continue to be high in Que. and are relatively high in Man. For years Irish Cobbler and Green Mountain have been the leading varieties, but Katahdin has been increasing in popularity until the certified acreage of Katahdin was more than that of either of these two varieties in 1947 and nearly equalled their combined acreage in 1948.

EARLY BLIGHT (Alternaria Solani) was prevalent in the B.C. Interior owing to the excessively wet season; ordinarily it is not seen there (G.E. Woolliams). It was found in 31.8% of the 932 fields inspected in B.C., nearly a 3-fold increase over last year; infection was 246-sl. 42-mod. and 8-sev. (H.S. MacLeod). Infection was tr.-sl. in commercial plantings at Edmonton and severe at the Station, Lacombe, Alta. (T.R. Davidson, J.W. Marritt). Early blight was fairly general in Sask., but infection varied greatly; tubers affected by Alternaria rot were received from Lumsden and Weyburn (A. Charlebois). Foliage damage was sl.-mod. at four places in Man., mostly in early varieties. Traces occurred through northwestern Ont., but infection was considerable in the Thunder Bay District (D.J. Petty). Traces occurred in southwestern Ont. (F.J. Hudson); little or no damage occurred in Inspection District 2 (W.L.S. Kemp); it was less prevalent in District 3 than in 1947 although it was reported in several fields (H.W. Whiteside).

Of 913 fields inspected in Que., infection was 306-tr. 55-sl. and 5-sev.; no tuber rot was seen (B. Baribeau). Very light infections were noticed in a few fields of early varieties in N.B.; no tuber rot was seen (C.H. Godwin). Early blight was first reported in N.S. on Irish Cobbler on 9 Aug. in the Valley, Kings Co., and infection was later severe in one field

of Warba and one of Early Rose. Infection was moderate in Antigonish Co., but it was only a trace in Colchester and Cumberland Counties; no rot was seen (R.C. Layton). A few leaves of plants on a cull pile were affected at Pereaux on 20 July (K.A. Harrison). Infection was negligible in P.E.I. (S.G. Peppin).

Table 4. Seed Potato Certification: Number of Fields and Acres Inspected, 1948

Province	Number of Fields		Fields Passed %	Number of Acres		Acres Passed %
	Entered	Passed		Entered	Passed	
P.E.I.	9,142	7,020	76.8	38,743	29,384	75.8
N.S.	642	530	82.6	1,376	1,085	78.9
N.B.	2,761	2,602	94.2	20,748	19,472	93.9
Que.	913	593	65.0	2,560	1,578	61.6
Ont.	850	658	77.4	2,536	2,032	80.1
Man.	151	90	59.6	573	373	65.1
Sask.	74	66	89.2	122	96	78.7
Alta.	170	142	83.5	781	534	68.4
B.C.	932	803	86.2	3,122	2,838	90.9
Total	15,635	12,504	80.0	70,561	57,392	81.3

Previous Yearly Totals

1947	14,616	12,605	86.2	60,385	53,474	88.5
1946	14,198	11,628	81.9	66,665	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

Acres Entered

1947	60,385
1948	70,561

Increase of 10,176 or 16.9%

Acres Passed

1947	53,474
1948	57,392

Increase of 3918 or 7.3%

Table 5. Seed Potato Certification: Acreage Passed by Varieties, 1948

Variety	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.-Alta.	B.C.	Total
Katahdin	4,503	558	15,307	9	1,456	35	36	21,904
Irish Cobbler	10,411	201	550	194	172	171	2	11,701
Green Mountain	7,859	105	2,001	1,366	52	22	172	11,577
Sebago	6,383	102	414		39	2		6,940
Netted Gem	2		9		3	558	1,574	2,146
Bliss Triumph	6	64	928			8	3	1,009
White Rose			11			4	681	696
Chippewa	37	2			253	9	17	318
Warba	8	25	4		8	38	163	246
Pontiac	21		163			16		200
Sequoia	153	15						168
Columbia Russet						54	62	116
Canus					3	17		20
Others	1	13	85	9	46	69	128	351
TOTAL	29,384	1,085	19,472	1,578	2,032	1,003	2,838	57,392

Table 6. Seed Potato Certification: Fields Rejected on Field Inspection, 1948

Province	Leaf Roll	Mosaic	Ring Rot in field	Ring Rot on farm	Black Leg	Adjacent Diseased Fields	Foreign Varieties	Misc.	Total
P.E.I.	156	1122			225	222	202	195	2122
N.S.	13	13	13	23	5	35	5	5	112
N.B.	5	46	41	12	13	5	35	2	159
Que.	12	29	174	52	27	14	6	6	320
Ont.	101	4	18	5	5	8	11	40	192
Man.	2	8	8	31	2	1		9	61
Sask.			1		5			2	8
Alta.			2	1	17	3		5	28
B.C.	22	6			24	14	9	54	129
TOTAL	311	1228	257	124	323	302	268	318	3131
Rejections as a percentage of fields:									
Entered	2.0	7.9	1.6	0.8	2.1	1.9	1.7	2.0	20.0%
Rejected	9.9	39.2	8.2	4.0	10.3	9.6	8.6	10.2	100%

Table 7. Seed Potato Certification: Average Percentages of Diseases found in Fields, 1948

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	.27	.05	.06	.18	.03	.10	.32	.48	.10
Leaf Roll	.28	.24	.18	.08	.11	.30	.04	.05	.13
Mosaic	.73	.19	.10	.19	.02	.55	.14	.01	.05
Fields passed: (final inspection)									
Black Leg	.09	.02	.04	.07	.02	.05	.03	.09	.04
Leaf Roll	.09	.12	.17	.07	.07	.03	.01	.01	.05
Mosaic	.09	.10	.04	.08	.01	.03	.03	.01	.01

BLACK DOT (Colletotrichum atramentarium). A light infection was observed in a field of Green Mountain at Ste. Anne de la Pocatiere, Que.; a small percentage of plants were killed before the others reached maturity (A. Payette). Several plants were dead or dying on a cull pile at Pereaux, N.S. (K.A. Harrison).

BACTERIAL RING ROT (Corynebacterium sepedonicum) was not found in any crop inspected for seed certification in B.C. In field inspections at digging time, covering about 600 acres, a trace of the disease was found in tablestock on two farms in the Lower Fraser Valley. It was also found in 3 back-yard gardens. The potatoes used were uncertified and were imported into B.C. (H.S. MacLeod, W.R. Foster, I.C. MacSwan). Ring rot was found in 23 of the 33 cars shipped into B.C. from Man., some of which were badly affected. On the other hand only a trace was found in 6 out of 177 cars received from Alta. Most of the inspections are made by the Dominion Inspectors, Fruit and Vegetable Division, and suspected ring-rot specimens have to be confirmed by a microscopic examination by a pathologist. Under present regulations carloads found affected must be disposed of in special markets or returned to the province or country of origin. Potatoes are now virtually free from bacterial ring rot in B.C. and the aim is to keep them free (W.R. Foster).

A very thorough survey for bacterial ring rot was possible in Alta. in 1948 on account of the open fall. The disease was found in a few more fields in the Lethbridge and Edmonton areas but there has been a decrease about Brooks and Calgary. Of the 1,394 farms (8,339 acres) surveyed, in 1948 ring rot was found on 93 (529 acres) or 6.7% of the fields, compared with 6.6% in 1947. Incidence of the disease was usually very low, being a trace to 0.5%. Factors that tended to increase its incidence were the use of poor seed because of the unusual high price of good stock this spring and potato growing was taken up by several new growers. An increasing number of farmers cooperate in disposing promptly of their infected stocks. When a grower fails to do so by a date set by the Field Crops Branch,

Alberta Department of Agriculture, such stocks are disposed of under the authority of the Agricultural Pests Act. It is felt that the extension programme should be increased and the regulations rigidly enforced if the disease is ever to be eliminated. Among the specimens sent to the Department for examination bacterial ring rot was detected in 1948 in tubers from two points outside the areas mentioned above. Such cases are regularly followed up to prevent further spread. The assistance of Dr. G.B. Sanford and Dr. L.E. Tyner is acknowledged (W. Lobay). Bacterial ring rot was found in 3 fields entered for certification in Alta.; two were planted with imported seed (J.W. Marritt). Ring rot was found in one field entered for certification in Sask.; slight to severe infections were seen in table stock fields at Estevan, Lumsden, Wilkie, Battleford, Saskatoon, Wynyard, Norquay, and Calder (A. Charlebois). A trace was found in 5 fields entered for certification in Man. (D.J. Petty). Bacterial ring rot was found in Man. in tubers of Irish Cobbler table stock submitted by the Dominion inspectors. These specimens were from 41 carload lots intended for shipment to B.C. About 31 carloads were diverted to special consumers on arrival in B.C. because of the presence of ring rot. It appears that the provincial legislation has not been enforced (W.A.F. Hagborg).

Bacterial ring rot was not found in southwestern Ont. (F.J. Hudson). The disease was found in only 5 fields entered for certification and in other fields on the farm in 6 cases in District No. 2 (W.L.S. Komp). Ring rot was found in 9 fields for certification in District No. 3, and infection was rather heavy in one in the Walford section where the disease has not previously been detected. No ring rot was found for the second year in Morgan Township in the Sudbury district where a clean up campaign was carried out in 1946. We believe that such programmes are effective in the control of the disease (H.W. Whiteside). Ring rot was found on 5 farms of seed growers in eastern Ont. (O.W. Lachaine).

In the 6th annual survey of table stock potatoes conducted by the Ontario Department of Agriculture, bacterial ring rot was found on 250 farms (about 8 % of the farms inspected); about 1200 acres of crop were affected. The percentage infection was very low in most cases. The amount of disease was less than in 1947 when 1900 acres on 351 farms were affected. Of the 250 farms where ring rot was observed in 1948, the disease was found on 39 in 1947 and on 49 in 1946 or earlier; it was found for the first time on the remaining 162 farms. Thus, 89% of the farms on which ring rot was detected in 1947 were apparently free of disease in 1948. The greatest reduction in the incidence of disease was in the Sudbury District where the number of farms affected fell from 128 in 1947 to 21 in 1948 (L.T. Richardson).

Bacterial ring rot was more prevalent in fields entered for certification this year in Que. than in 1947. Of the 913 fields inspected 174 fields or 19% were rejected on account ring rot in 1948 compared with 110 fields or 12% in 1947. The prevalence of the disease may be attributed mainly to the use of custom machinery or other contaminated equipment. Infection varies from a trace to 1%.

From examination of a large number of fields of table stock in many counties in Que. it appeared that bacterial ring rot would probably cause more loss to table stock growers than all other potato diseases combined. In Matane and Rimouski Counties where a large number of fields were visited 104 fields planted with uncertified seed of Irish Cobbler, Green Mountain, Warba, Sebago, Katahdin, Spaulding Rose and mixed varieties

were affected, infection ranging from 16 to 60% and in a great many of the affected hills there were no marketable tubers. Only 17 of these fields were visited at harvest time, but it is estimated that 10-16% of the tubers were left in the field because of rot. These figures only represent certain districts where the disease is prevalent whereas the average loss for the province is much lower (B. Baribeau).

Bacterial ring rot was found in 41 fields entered for certification and in other fields on 12 farms in N.B. Infection was very low this year, the highest being 1.4% (C.H. Godwin). A survey was again conducted for bacterial ring rot in N.S. by Dominion inspectors, Fruit and Vegetable Division, and men of the N.S. Department of Agriculture. Inspection was completed of the commercial producing area in Kings Co., the more important areas in Hants, Cumberland, Colchester and Pictou Counties, and all fields where ring rot had been reported in the past two years. Out of 1602 fields (1673 acres) inspected ring rot was found in 16 fields (42.5 acres). Four of the affected fields were planted with table stock and 12 with certified seed. One of the table stock fields was apparently a repeat from 1946 due to an incomplete clean-up. Nine fields were planted with certified seed from the same source; the seed for the other 3 fields apparently was clean but had become contaminated from second hand bags or barrels. In 10 of these 12 fields ring rot was found only during third inspection. All potatoes from affected farms are marketed where it is believed they will be consumed immediately (R.C. Layton). No bacterial ring rot was found in fields entered for certification in P.E.I. (S.G. Peppin).

POTATO ROT NEMATODE (Ditylenchus destructor). The present status of this pest in P.E.I. is discussed in an introductory section, Notes on Some Plant-Parasitic Nematodes, by Dr. A.D. Baker.

BLACK LEG (Erwinia phytophthora) was found in 188 (20%) of the fields inspected in B.C., but it was much more severe in the affected fields in 1948 than in recent years and caused the rejection of 24 fields. Factors believed to have favoured the disease were high soil moisture and unfavourable growing conditions in the early part of the season -- many fields were flooded after the crop was planted (H.S. MacLeod). Black leg was found in crops of both seed and table stock planted with Warba, Epicure, Great Scott and Katahdin at Ladysmith, Keating and Sidney, B.C.; damage was severe in some fields (W. Jones). Black leg was found in 73 (43%) of the fields entered for certification in Alta. and caused the rejection of 17. The disease was twice as prevalent as last year; soil moisture was excessive in spring and early summer. Black leg was severe in fields of Irish Cobbler grown for the early market about Lethbridge (J.W. Marritt). Infection was a trace to severe in commercial plantings about Edmonton (T.B.D.).

Black leg was found in 22% of the fields inspected in Sask. and caused the rejection of 5 fields. The marked increase in prevalence in 1948 may possibly have been due to the soils of affected fields being too wet at planting time; late spring and early summer were dry and unusually hot (A. Charlebois). Although few cases of black leg were reported in Sask., two or three cases were observed where 10-30% of the plants were killed (H.W.M.).

Diseased plants were received from Brandon, Man. (W.A.F. Hagborg). Black leg affected 30% of the fields inspected in Man., infection ranging from a trace to 0.3%, and one field was rejected. In northwestern Ont., 20% of the fields were affected, infection ranging from a trace to 0.75% (D.J. Petty). Black leg was found in only 2 fields inspected in southwestern Ont. (F.J. Hudson) and in 6 fields in the Leamington area, where a few plants were affected (C.D. McKeen). In District 2, only 2 fields were rejected on account of black leg in 1948 (W.L.S. Kemp). Black leg was not prevalent in District 3. Only 3 fields were rejected, but the seed had not been treated before planting. The disease was confined to Irish Cobbler in the Dufferin area, where it was prevalent in the early years of seed production but was gradually eradicated by seed treatment (H.W. Whiteside). Black leg was found in 4 out of 53 fields inspected in eastern Ont. (O.W. Lachaine). Black leg caused the rejection of 27 fields out of 913 inspected in Que. Of these fields, 19 were in the Chicoutimi and Lake St. John districts where the weather had been cool and wet early in the season; moreover, a survey revealed that the disease was mostly confined to farms where the cut seed was left in bags for 5-7 days before planting. One grower of certified seed planted 26 acres in 3 fields, two of which were planted with freshly-cut seed, whereas the seed for the third field was cut and left unplanted in bags for a week; black leg was absent from the first two fields but was affecting 4% of the plants in the third at the time of inspection (B. Baribeau). The incidence of black leg seems to be on the increase in recent years in N.B. Sebago and Katahdin appeared to be most infected, with fields showing up to 10% of the plants affected. Late infections are common in Katahdin. Some fields of table stock about Grand Lake showed up to 30% infection in Warba. The disease caused the rejection of 13 fields (J.L. Howatt, C.H. Godwin). Black leg was found in 56 fields of the 642 inspected in N.S. and caused the rejection of 5 fields all of Sebago. Infection ranged up to 4.2%. Very high infections were reported in fields of Sebago in Pictou Co. (R.C. Layton). Black leg was more prevalent than usual in P.E.I. and caused the rejection of 225 fields. Sebago seems to be very susceptible wherever it is grown (S.G. Peppin).

WILT (Fusarium oxysporum) was found in only 56 (6%) of the fields inspected in B.C. and caused 3 to be rejected; the disease was much less prevalent than last year (H.S. MacLeod). In contrast with other years infection was very low in Sask. (A. Charlebois). Wilt was found in 12% of the fields inspected in Man. In the Winnipeg area 1% of the plants were affected in one field and 10-20% in 5 other fields causing their rejection. It is believed that soil infection was responsible for the high incidence of wilt in the area (D.J. Petty). Wilt was more prevalent in the London area, Ont., than in 1947 (F.J. Hudson). Very little wilt occurred in District 2; one field was rejected (W.L.S. Kemp). Wilt was observed in fields throughout District 3 and one field was rejected. Wilt seemed on the increase in an excellent strain of Irish Cobbler planted about Charlton; no fields were rejected on field inspection but up to 25% of the tubers showed stem-end browning on bin inspection (H.W. Whiteside). Three fields were rejected on account of wilt in eastern Ont. (O.W. Lachaine). Wilt was quite common on first inspection in N.B., especially in imported stock, although no field was severely affected (C.H. Godwin).

WILT (Fusarium and Verticillium). Wilt was found in 14 (8%) of the fields inspected in Alta.; the fields were mostly under irrigation in southern Alta. (J.W. Marritt).

DRY ROT (Fusarium spp.). Some 5% of the table stock inspected in the Edmonton district, Alta. in the fall of 1948 showed some dry rot (J.W. Marritt). Fully 75% of the storage rot observed in reinspected carloads of Maritime stock appeared to be caused by Fusaria (W.L.S. Kemp). Dry rot was more prevalent in District 3 than in 1947; due to the fact that the crop is dug in this district while it is still immature, it suffers from bruising, but the lesions are usually superficial (H.W. Whiteside). Growers, who imported Irish Cobbler seed potatoes from the Maritime provinces for planting in Essex Co., Ont., brought tubers affected by dry rot to the laboratory; up to 1% of the tubers were affected in varying degrees (C.D. McKeen). Storage rot (F. sambucinum f. 6.) was quite severe in many potato lots harvested in 1947 in P.E.I. Losses in Green Mountain and Sebago were 5-10% of the crop with smaller losses in other varieties. Individual losses varied from a trace to 40% (G.W. Ayers). Dry rot affected 50% of the seed pieces in a field in Prince Co. (W.A. Hodgson). Storage rot was far less prevalent in P.E.I. this year than in the past 2 years; average loss in all varieties was about 1% (S.G. Peppin).

SKIN SPOT (Oospora pustulans). A few affected tubers were seen on two occasions in Queens Co., P.E.I. (R.R. Hurst).

RHIZOCTONIA (Pellicularia filamentosa (R. Solani) was found in 802 (86.5%) of the fields inspected in B.C., the infection being 611-sl. 194-mod. and 42-sev., and caused 2 fields to be rejected. Tubers were in general slightly to moderately infected (H.S. MacLeod). A moderate infection occurred in 14 (8%) of the fields inspected in Alta.; little or no disease occurred in the others. Sclerotial development was slight to moderate on late harvested crops and those injured by an early severe frost (J.W. Marritt). Rhizoctonia appeared to have caused little damage in Sask. (A. Charlebois), Man., or northwestern Ont. (D.J. Petty). A slight development of sclerotia occurred on tubers where the disease was present in southwestern Ont. (F.J. Hudson). Sclerotia developed on about one quarter of the crops in District 2; infection varied from 1-2% to 10-20% (W.L.S. Kemp). Rhizoctonia was less prevalent in District 3 than in 1947 and only crops harvested long after the vines were dead showed any appreciable development of sclerotia on the tubers (H.W. Whiteside). Rhizoctonia was found on a few tubers at bin inspection in eastern Ont. (O.W. Lachaine). Infection was 150-sl. 4-mod./913 fields inspected in Que. On bin inspection the average infection of the tuber was slightly above 1% and ranged up to 15% (B. Baribeau). Rhizoctonia was severe on Chippewa, Houma and McIntyre Blue in a planting at Deschambault (H. Genereux). Little rhizoctonia was seen in the growing crop in N.B.; tubers also showed few sclerotia (C.H. Godwin). Infection in the field was never more than slight in N.S.; on the tubers it varied from 1 to 20% in 68 out of 175 bins so far inspected (L.C. Layton). Infection was negligible in P.E.I. (S.G. Peppin).

PHOMA ROT (P. tuberosa). A single affected tuber was seen on a local market, Queens Co., P.E.I. (R.R. Hurst).

STEM-END HARD ROT (Phomopsis tuberivora) was found on an occasional tuber in North Saanich, B.C. (W. Jones).

PINK ROT (Phytophthora erythroseptica) caused severe damage to a field of potatoes at Summerland, B.C., on clay-loam soil that was flooded late in the season (G.E. Woolliams, W. Jones). One case of the disease was observed in the Cochrane district, Ont. (H.W. Whiteside). Affected tubers were received from Ramore and Trenton, Ont. (L.T. Richardson). A few tubers affected by watery rot were found in the variety plots at Ste. Anne de la Pocatiere, Que.; the pathogen was isolated (A. Payette).

LATE BLIGHT (Phytophthora infestans) was more general and widespread in B.C. than any previous year and many fields were severely damaged. The disease was general in Vancouver Island, in the Fraser Valley, Kamloops, North Okanagan and the West Kootenay. It was found for the first time in the Cariboo. Dry weather during September and October checked the disease to some extent (W.R. Foster). The unusually heavy rainfall and cool weather throughout the spring and summer was a major factor in the development of the highest incidence of late blight on record in the coastal area. The high rainfall was favourable for the spread of the disease and hindered spraying operations. Vine and tuber infection was severe in many fields and the crop was a total loss in some. In the East Delta area tuber infection was much higher in crops on clay than those on peat and muck soils (I.C. MacSwan). Late blight was found on 27 May at Ladner on Early Epicure being grown as table stock for the early market. It is suspected that the disease was initiated from affected culls. Infection was 276-sl. 120-mod. 149-sev./932 fields inspected; 3 fields were rejected. Although the disease was prevalent and severe on the vines, tuber infection was less than expected. (H.S. MacLeod). In most years late blight is unknown in the B.C. Interior, but due to very heavy rains in August the disease was found frequently in most of these districts, where it affected both the vines and tubers. Only on one previous occasion has late blight been reported in the semi-arid districts of B.C. (G.C. Woolliams).

Late blight caused moderate damage in some areas in eastern Sask., particularly in those adjacent to the Man. boundary. Specimens or reports were received from a dozen localities. Previous to 1947 (P.D.S. 27:67), when the disease was noted in 2 localities, but caused no damage, it was unreported in Sask. (H.W.M.). Late blight appeared first on 13 July in south-eastern Man. and spread with great rapidity over the remainder of the arable part of the province. Although at first it appeared that a severe epidemic of late blight would occur its spread was arrested by dry weather in August and September. Blight continued to develop, however, in the more northern areas and considerable tuber rot occurred before digging. Serious loss in storage is not anticipated (J.E. Machacek). Damage to the foliage was quite general throughout Man. and northwestern Ont. but tuber loss was small. However, the loss was considerable in the Dauphin and Clear Lake areas in Man. where heavy rains fell in mid-August. The loss was 10% of the tubers also in some areas in the Thunder Bay district, Ont. (D.J. Petty).

Late blight appeared almost simultaneously around 15 July in widely scattered potato and tomato areas of Ont. from Haldimand Co. to Temiskaming.

Within two weeks it was reported from all the major producing areas in northern, central and southwestern Ont., from Prince Edward Co. early in August and from the easternmost part of the province later in August. In general late blight first appeared on potatoes and then spread to adjacent tomatoes. The first outbreaks were in many cases in small gardens in towns and villages. By July the major potato and tomato areas were threatened by heavy losses from late blight, but dry weather through August and most of September held the disease in check and losses were relatively small. It would appear that the blight fungus overwintered in diseased potato tubers. The disease spread to the vines from diseased tubers which were planted or left in exposed cull piles. Then the disease spread from the potato plants to tomatoes. Several samples of diseased potato tubers were received about harvest time. Undoubtedly such tubers will serve as a source of inoculum next year (J.D. MacLachlan). Early in August 4 fields in Middlesex Co. were severely affected (F.J. Hudson). One severely affected field of Early New Yorker in District 2 (W.L.S. Kemp). Although late blight became general over District 3, most growers were able to keep the disease well under control. However, in the Cochrane district where late blight was not fully controlled by the application of fungicides, the vines were killed by calcium cyanamid, 50-100 lb. per acre being most commonly used (H.W. Whiteside).

Late blight was first reported on 30 July in Temiscouata Co., Que.; on 6 Aug. from Papineau and Gaspe Counties and the Eastern Townships. It spread slowly in August and by 3 Sept. the disease was usually only a trace in most potato growing centres except in the Matapedia valley and at Douglastown, Gaspe Co. where 40-50% of the foliage was destroyed. By mid-September only well sprayed fields or those of the variety President were still green. Some 5-10% tuber rot occurred in early dug fields. The disease was checked by clear dry weather in late September and early October. Growers were encouraged to use vine killers sodium arsenite with waste crankcase oil and copper sulphate in partially blighted fields. Excellent results were obtained and more growers would have used sodium arsenite if they could have purchased a supply. Late blight was found in 30% of the bins and fields inspected at digging time, the average infection being 1.6% of the tubers in the affected fields (B. Baribeau). Late blight became quite general on the potato foliage about Quebec City. In spite of the low rainfall, the humidity was sufficiently high for the fungus to sporulate freely (O. Caron). Late blight appeared by 30 July in N.B. Conditions were favourable for early infection and unsprayed fields were soon defoliated. Intermittent periods of unfavourable weather prevented the development of an epidemic and where spraying was thorough the disease was held in check. It was possible to postpone digging until all spores were destroyed; average tuber infection did not exceed 1%. All shipments this year were very free from tuber rot (J.L. Howatt, C.H. Godwin). Late blight was first reported on 3 Aug. in Kings Co., N.S., 5 Aug. in Yarmouth Co., etc. By 11 Sept. the disease was severe in most coastal areas of Annapolis, Yarmouth and Digby Counties; practically every unsprayed field was completely defoliated. Late blight was general in Kings Co. this year but due to an extensive spray programme almost no tuber rot was reported. More rot might have been reported but a severe frost caused a loss of 20% of the late crop. In other counties where less spraying is done up to 5% of the crop was affected by tuber rot in some fields. Late blight had

destroyed 20% of the foliage of plants nearly in bloom in a cull pile at Centreville on 17 July (R.C. Layton, K.A. Harrison). Late blight was observed on young potato sprouts in a small cull pile near Charlottetown, P.E.I., on 3 July and the first field infection was noted on Irish Cobbler at Harrington on 26 July. During the next several days infected fields were found in the other two counties. Weather in July was ideal for the development of an epidemic. Frequent rains spread over 2-3 day periods rather, than the total rainfall, were important in the spread of the disease. By 20 Aug. many unsprayed or poorly sprayed fields were dead, but the disease was kept under control in fields where the spray programme was adequate. Failure to spray until the disease had become established was the principal cause of losses.

In most fields loss from tuber rot was slight. Destruction of the vines by chemical sprays or mechanical beaters was very general this season and was probably responsible for reducing tuber rot to a minimum. The main loss was due to reduction in yield brought about by injury to the vines and their early death. (L.C. Callbeck). Losses from defoliation and early death of the vines averaged 5-10% in P.E.I., losses from tuber rot 8% (S.G. Peppin).

LEAK (Pythium ultimum), as a set rot, caused severe damage in a 5-acre field in North Saanich, B.C.; rainy warm weather prevailed at the time (W. Jones). Leak was found affecting 10% of the Canus tubers in storage on 20 Oct. and the Horticulture Substation, Smithfield, Ont. Other varieties grown in the same field appeared to be free. The causal organism was isolated and positively identified from the sporangia, oogonia and antheridia, which corresponded with Trow's original description of P. ultimum and not with P. de Baryanum. This storage rot has frequently been attributed to bacterial soft rot in the past as a result of casual examination. After identifying these specimens the same trouble was found in tubers of Green Mountain grown at Ottawa and stored at the Central Laboratory. The causal organism depends mainly on mechanical injuries for entrance into the tubers and its development is favoured by relatively high temperatures. Canus is quite thin-skinned and thus more easily bruised than most varieties. The presence of Pythium in suspected specimens is readily determined by microscopic examination of a scraping of the affected tissue in a cut tuber especially near the boundary between the diseased and healthy tissues. Abundant inter- and intracellular coenocytic hyphae will be observed. A useful account of the disease has been published by Walter Jones (Sci. Agric. 15(6):402-410. 1935). Affected specimens were received 4 Nov. from Renfrew; the enquirer reported "there were quite a few like this" in picking over 325 bags (L.T. Richardson). Only a few affected tubers were found this year in the Laboratory plots, Ste. Anne de la Pocatiere, Que. The organism was isolated. Affected tubers have also been brought in by local farmers (A. Payette). Leak was found in 2 lots on bin inspection; 0.5-1% of the tubers were affected (B. Baribeau).

In the light of these observations it seems probable that much of the bacterial soft rot reported (P.D.S. 27:65) is actually leak. This year according to A. Charlebois tubers affected by bacterial soft rot were seen in more bins than usual in Sask. due possibly to the warm fall. Upon request, 6 tubers were submitted for examination; 4 were found affected by leak and 2 by Fusarium dry rot by Dr. Richardson (L.L. Conners). The disease was present in District 3, Ont. (H.W. Whiteside).

POWDERY SCAB (Spongospora subterranea) was present in a few lots in Rimouski, Temiscouata, Terrebonne, Megantic, Arthabaska and Chicoutimi

Counties, Que.; infection was slight (B. Baribeau). The disease was found in 6 lots of potatoes on bin inspection in the Scotts Bay district, N.S. The highest infection was about 3% in Irish Cobbler, with under 1% in Green Mountain, Bliss Triumph and Katahdin (R.C. Layton). Two lightly infected tubers of Green Mountain from a vegetable garden at Charlottetown, P.E.I., were seen 20 April 1948 (R.R. Hurst).

SILVER SCURF (Spondylocladium atrovirens). Traces were observed on 6 varieties of potatoes in Que. during bin inspection or on the local markets (B. Baribeau).

COMMON SCAB (Streptomyces scabies (Thaxt.) Waksman & Henrici (=Actinomyces scabies (Thaxt.) Güssow) was not as prevalent nor as severe in B.C. as in 1947, although it was present on a few varieties in some areas (H.S. MacLeod). Scab infection was in general slight and superficial in Alta. (J.W. Marritt). Infection was mod.-sev. in the variety plots at Lacombe and tr.-sl. at Edmonton (T.R.D.). The growing season was dry over much of Sask. Common scab was quite prevalent and in several commercial fields about Saskatoon it was more severe than usual (H.W.M.); severe in a private garden at Prince Albert (T.C. Vanterpool). Light infections were observed in a few fields in Man. and northwestern Ont.; one crop of Chippewa at Clear Lake, Man., showed 30% moderate to severe scab (D.J. Petty). Very little severe scab was observed in southwestern Ont.; slight scab was quite general (F.J. Hudson). Common scab occurs annually in District 2, but its occurrence on any one farm fluctuates widely from year to year. Scab is the chief cause of surface blemish to tubers of Irish Cobbler, Chippewa and Katahdin. No scab resistant variety was grown for certification in 1948 (W.L.S. Kemp). Scab infection was general throughout southern Ont., the amount being extremely variable in quantity and severity from farm to farm and in different districts. Samples were collected from 82 fields; area of tuber surface covered by lesions was: over 10% (max. 30%) in 10 fields, 5.1-10.0% in 14, 3.1-5.0% in 17, 1.1-3.0% in 26 and 0.2-1.0% in 15; average was 4.5% (J.K. Richardson). Scab was less severe in district 3 than in 1947 (H.W. Whiteside). A very light infection was present in eastern Ont. (O.W. Lachaine). Common scab was more prevalent in Que. than in 1947 but the percentage of infection was slight. In some localities where fresh manure or lime were used scab was moderate to severe. In certain areas in Kamouraska and Temiscouata Counties where tuffa predominates in the soil potatoes show a mild scab russetting. Scab was moderate on local table stock on the Montreal market (B. Baribeau). Of the 30 varieties under cultivation at Deschambault scab was severe on Arran Chief, Sunrise, Mohawk, Houma, Pawnee and Early Rose; about half the tubers were lesioned with about 5% of scab on the affected tubers (H. Genereux). Scab was found in all parts of N.B. and caused about 2% loss of crop (C.H. Godwin). A carload of Irish Cobbler from Woodstock showed about 40% of the tubers severely affected by russet scab; the organism fruited on the tubers when held in a moist chamber (H.N. Racicot). Scab was not prevalent in N.S. in 1948. Two lots were reported where 30 and 50% of the tubers were severely scabbed and small amounts of scab occurred in 30% of the bins inspected (R.C. Layton). Common scab was quite prevalent in P.E.I.; average loss was about 2% (S.G. Peppin).

WILT (Verticillium spp.) was noted in some fields of Green Mountain of P.E.I. origin; infection was slight to moderate (B. Baribeau). Wilt was reported in 88 (13.7%) of the fields inspected in N.S. and caused 3 to be rejected. The highest infection was 5% (R.C. Layton). Wilt was less prevalent in P.E.I. than in 1947, and only 22 fields were rejected this year as compared with 92 last year (S.G. Peppin). Verticillium wilt did not reach serious proportions in P.E.I. in 1948 and was confined to Irish Cobbler and Sebago. As in past years, Kings Co. remained practically free of the disease (G.W. Ayers).

LEAF ROLL (virus) was found in 312 (33.5%) of the fields inspected in B.C. and caused 22 to be rejected. The disease was more prevalent and severe particularly in the Grand Forks and Bridesville areas (H.S. MacLeod). It was present in 25 (15%) of the fields inspected in Alta., in 1948, a marked decrease from 1947 (J.W. Marritt). Slight to moderate infections were seen in 30 commercial plantings about Edmonton (T.R. Davidson). Leaf roll affected 18% of the fields inspected in Sask. (A. Charlebois) and 30% of those inspected in Man. and northwestern Ont. and 3 fields were rejected. (D.J. Potty). Low infections of leaf roll were found in many fields in southwestern Ont.; 7 fields were rejected (F.J. Hudson). Fifteen fields were rejected on account of leaf roll in district 2; it is the most common cause of rejection in this district (W.L.S. Kemp). In district 3, 72 (14%) of the fields inspected were rejected on account of leaf roll. Chippewa appears to be the most susceptible of the varieties being grown and cannot be maintained free of leaf roll for more than two years when grown in this district south of the Cochrane area. Aphids had not been observed in this area until 1948, when a few aphids, mostly Macrosiphum solanifolii, along with an occasional Myxus persicae were observed (H.W. Whiteside). Three fields were rejected in eastern Ont. on account of leaf roll (O.W. Lachaine). Leaf roll infection was at a very low figure in Que., only 1.3% of the fields inspected being rejected in 1948 (B. Baribeau). There has been a marked decline in the amount of leaf roll in the last two years in N.B.; this year only 5 fields were rejected. Aphid infestation has been very slight in the past 2 years. With the use of DDT becoming quite general and the early killing of tops practised by the best growers field transmission of leaf roll has been almost negligible and thus much cleaner seed is being distributed in the commercial areas. Considerable leaf roll occurs in table stock where old stock is still planted (C.H. Godwin). Leaf roll was reported in 251 fields of 642 inspected in N.S. and caused 13 to be rejected (R.C. Layton). Leaf roll caused the rejection of only 156 fields in P.E.I. in 1948, a slight reduction from last year (S.G. Peppin).

LEAF ROLLING MOSAIC (Solanum virus 1). Two plants were found infected in a field of table stock of Green Mountain in Sunbury Co., N.B. (D.J. MacLeod).

LATE LEAF ROLL (virus) was common in potato fields in Carleton, York and Sunbury Counties, N.B. It was observed in Katahdin, Irish Cobbler, Bliss Triumph, Sebago, Pontiac and 7 seedlings (cf. P.D.S. 27:69) (D.J. MacLeod).

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

MILD MOSAIC (Solanum virus 3) ranged from a trace to 12% in table stock fields of Green Mountain in Carleton, York and Sunbury Counties, N.B. (D.J. MacLeod).

MILD MOSAIC (Solanum virus 11) was found affecting 4 plants in a field of Irish Cobbler table stock in York Co., N.B. (D.J. MacLeod).

CRINKLE MOSAIC (Solanum viruses 1, 2 and 3) ranged from a trace to 7% in fields of Green Mountain table stock in York, Sunbury and Carleton Counties, N.B. (D.J. MacLeod).

MOSAIC (virus) was found in 204 (22%) of the fields inspected in B.C. and caused 6 to be rejected (H.S. MacLeod). It was found in 16 (9%) of the fields inspected in Alta. (J.W. Marritt) and 57 (47%) in Sask. (A. Charlebois). Due to the cool weather in 1948 mosaic was much more apparent in Man. and northwestern Ont. than last year. In fact all fields of Bliss Triumph except one indexed field were rejected for mild mosaic, some fields showing 50% or more affected plants (D.J. Petty). Little mosaic was observed in District 2 and no fields were rejected (W.L.S. Kemp). Mosaic was observed in Green Mountain and Chippewa in District 3, but no fields were rejected. Mild mosaic was present in all Green Mountain fields in eastern Ont., but none were rejected (O.W. Lachaine). Mosaic was more prevalent in Que. than last year and 3.1% of the fields inspected were rejected (B. Baribeau). Mosaic appears to be increasing in N.B. Of 159 fields rejected 46 were turned down for mosaic; 45 were fields of Green Mountain with some running as high as 10% and one of Bliss Triumph with 12.9% mosaic. The disease showed up early and was prominent throughout the season (C.H. Godwin). Mosaic was reported in 188 of 642 fields inspected in N.S. and 13 fields were rejected; last year only one field was rejected (R.C. Layton). There was a marked increase in the prevalence of mosaic in P.E.I. in 1948; 1,122 fields were rejected this year compared with 358 in 1947 (S.G. Peppin).

PURPLE DWARF or HAYWIRE (virus) was found in 4 fields in Alta.; infection was less than 0.5% (J.W. Marritt).

PURPLE or BUNCH TOP (virus). Only a small percentage of affected plants was seen in one field in Alta. (J.W. Marritt). Infection ranged from 1 to 4% in one third of the fields inspected in Man. and northwestern Ont. (D.J. Petty). An occasional plant was found in fields in southwestern Ont. (F.J. Hudson). Only an odd plant found affected in District 2 usually near the road allowance; the common milkweed is believed to be the weed host (W.L.S. Kemp). Affected plants were observed in President, one field of Green Mountain and plots of Arran Chief and Arran Victory in Que.; percentage infection was low (B. Baribeau).

Purple or bunch top was general in potato fields in Carleton, York, Sunbury, and Westmorland Counties, N.B. Infection ranged from a trace to 7%. Current season symptoms of the disease were found in Green Mountain, Irish Cobbler, Bliss Triumph, Houma, Katahdin, Chippewa, Sebago, Mohawk and 9 seedlings. The secondary (haywire) stage was found in Green Mountain, Katahdin and Sebago fields in York Co.

Sixty-seven seed pieces which remained firm and intact during the growing season in a field of Green Mountain Foundation seed were planted in a greenhouse; 37 produced plants showing the secondary or haywire symptoms of the bunch-top virus; the other 30 failed to grow (D.J. MacLeod).

Purple top annually affects a small percentage of the plants in fields entered for certification in N.B. It is most prevalent in Katahdin (C.H. Godwin). Small percentages were reported in 3 fields of Sebago in N.S. (R.C. Layton).

RUGOSE MOSAIC (Solanum viruses 1 and 2). Infection ranged from a trace to 4% in table stock fields of Green Mountain in York, Carleton, Sunbury and Westmorland Counties, N.B. (D.J. MacLeod).

SPINDLE TUBER (virus). A small amount was found in 3 fields planted with the same stock in Alta. (J.W. Marritt). Virtually no spindle tuber was seen in Man. or northwestern Ont. except for one seed stock in Man., which showed 8% (D.J. Petty). A trace was seen in several fields in District 2 (W.L.S. Kemp). A few tubers were seen in the bin in District 3 (H.W. Whiteside). Observed in a few lots during bin inspection in Que. (B. Baribeau). Only a trace of spindle tuber is now found in N.B. seed due to the high quality of seed being planted (C.H. Godwin). Spindle tuber was reported in only one field in N.S. Both tops and tubers showed definite symptoms in this 9-acre field of Sebago (R.C. Layton).

WITCHES' BROOM (virus) was found in 123 (13.2%) of the fields inspected in B.C. and caused 10 fields to be rejected (H.S. MacLeod). The disease was present in 4% of the fields inspected in Alta. (J.W. Marritt). Four affected plants were found in plots at Edmonton (T.R.D.).

YELLOW DWARF (virus) was found in 3 fields of Green Mountain in District 3, Ont.; although the disease only affected the odd plant, they were usually severely injured (H.W. Whiteside).

YELLOW TOP (virus). Seven plants in a field of Green Mountain in N.B. developed an upward rolling and yellowing of the leaves in the upper part of the plant. Later these leaves turned a rusty yellow and the plants died prematurely. When scions from these plants were grafted to tomato the latter became severely stunted and distorted. Many axillary shoots with small chlorotic leaves developed. It may be noted that a virus obtained from the common milkweed, Asclepias syriaca showing a severe yellows produced the same symptoms in tomato (D.J. MacLeod).

FROST INJURY. A 5-10% loss occurred in crops dug late in District 2, Ont.; most of the affected tubers had already suffered from sunburn (W.L.S. Kemp). A heavy frost on 28 Sept. caused considerable damage in most districts in Que. The frost penetrated 1-1½ inches and many tubers near the surface were injured; up to 5-10% of the tubers were left in some fields. Field frost caused considerable damage in N.S. The loss in certified seed was at least 10%, and in some fields 25% of the crop was lost (R.C. Layton).

GIANT HILL was reported in 161 (17%) of the fields inspected in B.C. (H.S. MacLeod). Giant Hill was more prevalent in Alta. in Netted Gem than in 1947; it was found in 17 (10%) of the fields inspected (J.W. Marritt). Affected hills were seen in a few fields of Green Mountain in Que. (B. Baribeau). Giant Hill was reported in 4 fields of Green Mountain and 2 of Irish Cobbler, all planted in tuber units, in N.S. The tops were larger, coarser, and longer blooming than in normal plants, but the tubers were indistinguishable (R.C. Layton).

HOLLOW HEART (non-parasitic) was widespread in Man. in 1947 especially in Irish Cobbler, some crops containing 40-60% of affected tubers; in 1948 a trace to 10% of the tubers of Irish Cobbler were affected (D.J. Petty).

LIGHTNING INJURY was observed in one field in Que.; a patch 30 feet in diameter was burned in the middle of the field and at digging time no potatoes were found in the patch (B. Baribeau).

MAGNESIUM DEFICIENCY was observed in a field of Irish Cobbler on 22 June at Medford, N.S.; the plants reacted immediately to an application of magnesium sulphate (K.A. Harrison). Magnesium deficiency was not severe in P.E.I. in 1948. The increased use of dolomitic limestone and fertilizers containing magnesium is proving a corrective in many soils low in the element. The check plot in the 1948 magnesium fertilizer tests showed slight to moderate deficiency symptoms (G.W. Ayers).

NET NECROSIS was more prevalent and severe in crops of the B.C. interior than those at the coast. What was believed to be heat necrosis was noted in the Grand Forks and Bridesville districts. Net necrosis of all types caused the rejection of 24 fields in B.C. (H.S. MacLeod). Very little net necrosis was observed in Que. (B. Baribeau) and N.B. (C.H. Godwin).

NITROGEN DEFICIENCY caused considerable damage in a very sandy field in Queens Co., P.E.I. Shoots occurred singly, were small and upright, and the leaves were a very pale green (R.R. Hurst).

POTASH DEFICIENCY was general throughout a small field in Kings Co., P.E.I. (R.R. Hurst).

SUNSCALD. Some crops showed 1% of the tubers affected in Man. following extremely warm weather in September and early October with maximum temperatures of 75°-80°F. (D.J. Petty).

STEM-END BROWNING. Only a few cases of stem-end browning have been observed so far in N.B.; the long growing season permitted the crop to mature fully (C.H. Godwin). Stem-end browning was severe in the Scotts Bay area, N.S., in 1947; very few lots passed registration and in some lots 40% of the tubers were affected. Most growers used tubers from their own crop for seed in 1948 and again in some lots 40% of the tubers were affected. No pathogenic organism has been found by either K.A. Harrison or H.N. Racicot. Soil temperature and moisture were unfavourable (R.C. Layton).

RADISH

SCAB (Streptomyces scabies (Thaxt.) Waksman & Henrici). Radishes were affected by scab to such an extent in certain areas in a field of several acres in Wentworth Co., Ont., that considerable culling was required before the crop could be marketed (J.K. Richardson).

RHUBARB

LEAF SPOT (Ascochyta Rhei) affected every leaf on Early Sunrise at Kentville, N.S. (K.A. Harrison).

GREY MOULD (Botytris cinerea) attacked 15-20% of the petioles in one acre field at Essondale, B.C. affecting the petioles only where they were split following a period of heavy rain (I.C. MacSwan).

SOFT ROT (Erwinia carotovora) caused severe damage to plants in a garden at Ste. Anne de la Pocatiere, Que.; infection appeared to begin at the base of the petiole, causing the fall of the leaf (A. Payette).

SPINACH

LEAF SPOT (Stemphylium botryosum). Infection was general in a seed crop of Dark Green Bloomsdale at the Station, Saanichton, B.C., causing the foliage to wither prematurely (W. Jones).

SQUASH

MOSAIC (virus). The plants in 3 small plantings at Leamington, Ont., were so badly affected by mosaic that the crop was a total loss. In other fields in Essex Co. where the disease developed later in the season the damage was slight (C.D. McKeen).

SWISS CHARD

BLACK LEG (Phoma Betae). A light infection was observed on the main stem of a seed crop of Lucullus at the University, Point Grey, B.C. (H.N.W. Toms).

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). The presence of blue mould of tobacco in Ont. was confirmed at least one day earlier during the past season in the new tobacco belt, in Norfolk Co., than any previous year. In the old tobacco belt in Essex Co. the disease developed a few days later, which nearly equalled the record early occurrence of last year. Earliest occurrences were carefully investigated. Temperatures during this period ranged from 46° to 77°F. Various circumstances, including location of initial attacks in seedbeds, presence of weeds, and developmental stages of the host strongly indicated overwintering of the causal organism in most instances. Not only did they occur in widely-separated areas (200 miles) but also in areas where seedbed steaming is consistently practised, as well as areas where the seedbed muck is merely replaced annually. The usual source of overwintering material appears to be dead parts of the tobacco plant remaining in the permanent seedbeds.

A few seedbeds in Essex Co. where control measures were not initiated until blue mould became severe were destroyed by the disease. In other cases where infection was moderate to severe in both the old and new tobacco belts seedlings were retarded and transplanting was delayed, but the overall damage to tobacco seedlings in Ont. due to blue mould was less in 1948 than in 1947. During the latter part of the transplanting season the disease was prevalent throughout all Ont. tobacco-growing districts, except east of Toronto although the average damage was slight. Its mildness was apparently due to the fact that about 95% of the growers sprayed or dusted their beds with Fermate or Karbam; some growers in the old tobacco belt used PDB crystals and a few the new aerosol bomb containing benzyl salicylate. Weather conditions throughout the critical period were not unfavourable for disease development.

YELLOW PATCH (excessive nutrients) caused moderate damage during the past season in both the old and new tobacco belts. One severe case was traced to the application of commercial vegetable fertilizer containing 7% nitrogen.

DAMPING-OFF (Pythium sp., Rhizoctonia sp., etc.) caused the loss of some seedbeds in the northern part of Essex Co. and in Kent Co. soon after germination and necessitated their re-seeding. In nearly all cases these losses occurred in outside, cotton-covered seedbeds. It is felt that the practice in Kent Co. will need to be changed to prevent this recurring loss.

MUSHROOMS proved to be troublesome in Kent Co. and were responsible for loss of seedlings in portions of certain seedbeds.

2,4-D (Dichlorophenoxyacetic acid) INJURY. Several cases of 2,4-D injury, reported for the first time last year in Ont. tobacco, occurred again in Kent Co. Spraying outfits imperfectly cleaned were responsible in at least a few cases.

Diseases in the Field

BLUE MOULD (Peronospora tabacina). Damage to plants in the field during June and early July was widespread and greater than ever before in the new tobacco belt. Similar damage was observed in the old tobacco belt although it was less severe, indicating the greater abundance of inoculum and host material in the flue-cured tobacco districts. In some fields even top leaves were affected and damage was regularly more severe where air drainage was poor. The disease has not yet reached Que. where occur the oldest tobacco-growing areas in Canada.

BROWN ROOT ROT (cause undetermined) caused moderate damage in the old tobacco belt of Ont. The varieties Halley's Special and Harrow Velvet suffered most damage.

BLACK ROOT ROT (Thielaviopsis basicola) caused moderate damage in the dark tobacco area of Kent Co. Less than the usual amount of damage occurred in flue tobacco in Ont.

MOSAIC (virus) was widespread on burley tobacco in both Essex and Kent Counties. Damage became severe in certain fields near harvesting time and appeared to be associated in many cases with high populations of the tobacco aphid. While more than one virus strain was present, cucumber mosaic appeared to be the most prevalent.

RING SPOT (virus) occurred in mild form in some fields of burley tobacco in Essex Co. and about ½ acre of a field near Blenheim was severely affected.

FRENCHING (cause undetermined) was more widespread than usual in the old tobacco belt. Severe cases were nearly all limited to poorly-drained fields both north and south of Leamington.

SORE SHIN (Rhizoctonia Solani) was observed in moderate form on flue tobacco approaching maturity in Essex Co. This disease was extremely widespread and caused considerable damage in large areas of the Que. tobacco-growing district east of Montreal. More damage was observed on flue tobacco than on other types and appeared to be associated with large amounts of undecomposed plant residues in the soil.

LEAF SPOT (physiological) caused slight to moderate damage in certain crops during the latter part of the season in Essex Co.

POTASH DEFICIENCY was widespread during the latter part of the season in numerous burley tobacco crops, particularly near Leamington.

Other Observations

MOSAIC (virus). A 1% infection was observed in a field at Sumas, B.C.; it appeared that the disease was spread in two rows at topping (H.N.W. Toms). Infection was a trace to 7% in flue-cured varieties in the Joliette district, Que. The season was favourable for the spread of mosaic by implements, insects, etc. (F. Godbout).

TOMATO

EARLY BLIGHT (Alternaria Solani) caused moderate damage at North Saanich, B.C. (W. Jones). Scattered infections were seen on the leaves in the plots at Agassiz (H.N.W. Toms). It was found in May on young plants still growing in the cold frames at Vernon (G.E. Woolliams). Infection tr.-sl. in the plots at Lethbridge and Taber, Alta., and mod. in a field at Barnwell (M.W. Cormack). Early blight was very common in tomato-growing areas in central and southwestern Ont., but caused no significant loss (J.D. MacLachlan). Infection was moderate on the leaves of early varieties with a few fruits also affected in a 2-acre field at Harrow, Ont., and a trace to light in the Leamington area (C.D. McKeen). Infection was general on the lower leaves of 40 plants in a garden in Westboro, Ont. On 7 Aug. about 6 leaves per plant were dead and several more heavily spotted. The plants were staked but few suckers had been removed; plants were sprinkled up to late July. Plants were dusted on 1 Aug. and again 7 Aug. when all severely blighted leaves were removed. Some further spread took place, but a fair crop was harvested. Several other severe outbreaks occurred in the district (D.B.O. Savile). In one such outbreak damage was 10% (L.T. Richardson).

A 10% infection was present 27 May on plants in hot beds at Aylmer East, Que. (L.T. Richardson). Early blight was only observed late in the season in N.B. and it caused no reduction in the yield of green fruit (S.F. Clarkson). Young plants in flats were lightly affected in a greenhouse at Hantsport, N.S., but there was little further spread in the field (K.A. Harrison). Early blight was severe on the foliage in a field at Mill Village (D. Creelman).

GREY MOULD (Botrytis cinerea). Slight infection on green fruit in a greenhouse, Sidney, B.C.; humidity high at the time (W. Jones).

LEAF MOULD (Cladosporium fulvum). Infection was general on the foliage on commercial crops of V121 in 3 greenhouses about Victoria, B.C. (W. Jones). Present on greenhouse plants at Summerland (G.E. Woolliams). Infection severe in a greenhouse at Edmonton, Alta. (A.W. Henry). Leaf mould was found on many occasions attacking the foliage of early tomatoes in fields in the Leamington district, Ont., and in 2 fields considerable defoliation occurred. Humidity was high about the leaves due to frequent rains. In the fall greenhouse crop, V121 and other susceptible varieties were heavily infected and crops were severely damaged. V473 and Improved Bay State showed high resistance in all houses (C.D. McKeen). A light infection seen in a greenhouse in Queens Co., P.E.I. (R.R. Hurst).

ANTHRACNOSE (Colletotrichum phomoides). A few fruits were affected after a week in storage in Carleton Co., Ont. (L.T. Richardson). Anthracnose caused a 10% loss in a small garden at Beaumont, Que. (R.O. Lachance).

BACTERIAL CANKER (Corynebacterium michiganense). Infection was slight in some fields and severe in others in the Vernon district, B.C. (G.E. Woolliams). The disease was severe in the plots, University, Winnipeg, Man., and was also observed in a few home gardens. Diseased plants were received from Niverville (W.A.F. Hagborg).

FUSARIUM WILT (F. Lycopersici). In an 8-acre field of late tomatoes near Wheatley, Ont., 85% of the plants were affected. Harvesting had just begun and more than half of the plants were wilted or dead. A trace of wilt was found in a few greenhouse crops (C.D. McKeen).

LATE BLIGHT (Phytophthora infestans). Infection was general in Vancouver Island, B.C. At the Station, Saanichton, Stokesdale proved very susceptible and damage to the fruit was severe. Weather conditions were very favourable for the development of the disease. Late blight has not previously been observed in North Saanich (W. Jones). Infection was general about Vancouver; losses were 50-75% of the crop (H.N.W. Toms, H.N. Racicot). A slight infection was observed on tomato leaves at Gilbert Plains and Brandon, Man. (J.E. Machacek). Late blight appeared about 15 July almost simultaneously in widely scattered potato and tomato areas in Ont. and spread rapidly in the next two weeks. As outlined under late blight of potato, heavy losses were threatened but hot dry weather held the disease in check and losses were relatively small. Doubtless the chief source of inoculum is the fungus overwintering in the potato tuber, but some late blight may start in tomato fields from diseased plants brought in from the southern States and there is a possibility that spores are blown northward from the United States (J.D. MacLachlan). Late blight was first observed on both early and late tomatoes in the Harrow area on 16 Aug. One week later the disease was found in 15 late tomato fields. Severe fruit and leaf infection was apparent in all fields attacked. The disease then become quiescent during a hot dry spell, 23-30 Aug. On 16 Sept. late blight was again active in these and many other fields in Essex Co. However the harvest was nearly completed; losses were light in the fields where the disease appeared late in September but they amounted 20-75% of the crop where it first appeared in August (C.D. McKeen). Losses were comparatively light in the Niagara Peninsula except in a few fields (J.K. Richardson). A large part of the crop was reported lost on several farms in Russell Co. (H.N. Racicot). Late pickings were almost a complete loss at Ste. Anne de la Pocatiere, Que. (R.O. Lachance). Although the disease was kept well under control by spraying and dusting in N.B. a large amount of rot developed when the fruit was stored for a short period (J.L. Howatt). Late blight was general in all tomato plantings examined in P.E.I.; infection was slight to moderate (D.B. Robinson).

STEM ROT (Phytophthora parasitica). A damping off and stem rot was destructive to young plants growing in flats at Edmonton, Alta. (A.W. Henry). Stem rot caused the loss of upwards 20% of the seedlings in flats in 2 greenhouses at Leamington, Ont. The disease developed about 5 days after the seedlings were transplanted for the first time (C.D. McKeen).

BACTERIAL SPECK (Pseudomonas tomato) caused slight damage about Winnipeg, Man. (W.A.F. Hagborg). Only a few tomatoes in two small fields in the Leamington area, Ont. were affected (C.D. McKeen).

DAMPING OFF (Rhizoctonia Solani). Post emergence damping off caused considerable stunting of growth of tomato and pepper seedlings in Lincoln Co., Ont. from lesions near the soil line (G.C. Chamberlain).

STEM ROT (Sclerotinia sclerotiorum). A trace was found in several early tomato fields in the Leamington area, Ont. (C.D. McKeen).

LEAF SPOT (Septoria Lycopersici), as in previous years, in Essex Co., Ont., appeared early, and heavy infections were observed on many early tomato plants in April and May before they were transplanted to the field. Much defoliation occurred in many fields before harvesting had begun. Leaf spot was also found in many fields of canning tomatoes but in general appeared late in the season and was not destructive. It seems probable that the source of inoculum for the early crop is the unsterilized flats and soil that is used for the second transplanting (C.D. McKeen). A slight infection reported in a large planting near Ottawa, Ont.; a specimen was brought in for identification (D.B.O. Savile).

VERTICILLIUM WILT (V. albo-atrum) was found on both greenhouse and field tomatoes in the B.C. Interior (G.E. Woolliams).

BACTERIAL BLIGHT (Xanthomonas vesicatoria). Diseased plants, ready for transplanting to the field, were brought to the laboratory by 3 large growers of early tomatoes in Essex Co., Ont. Leaf and stem lesions were abundant. Source of infection was probably contaminated seed (C.D. McKeen). Traces were seen in a garden in Queens Co., P.E.I. (R.R. Hurst).

MOSAIC (virus). Fairly general in 5 greenhouses in Victoria, B.C. (W. Jones); a few plants affected in a greenhouse at Summerland (G.E. Woolliams). Infection was trace to severe in variety plots at Taber and moderate in a field at Barnwell, Alta. (M.W. Cormack). Leaves from diseased plants from Brandon, Man., received from the Division of Horticulture; 5 plants were inoculated and each showed typical symptoms of Nicotiana virus 1 (H.N. Racicot). Mosaic was of common occurrence in Ont. In some fields, especially in Prince Edward Co., severe stunting of the plants occurred before the first blossoms set fruit (J.D. MacLachlan). Up to 50% of the plants were affected in fields in south-western Ont. Aphids were abundant early in the season and may account for the high incidence of the disease (C.D. McKeen). Some 25% of the John Baer plants were affected in a planting in Prince Edward Co., whereas no disease was present in nearby plantings of Nystate, Clark's Early, Rutgers and Camdown. John Baer is a relatively susceptible variety (G.C. Chamberlain).

Mosaic (Cucumis virus 1) was widespread on tomatoes in Montreal, Que., and the vicinity. Specimens showed symtoms typical of this virus as described by Smith and by Doolitte (U.S.D.A. Farmers' Bull. 1934, pp. 39-41. 1948). Inoculations were made on healthy tomatoes in the greenhouse; symptoms typical of the virus developed (H.N. Racicot, J.E. Jacques). About 20% of the plants were affected in a field of early Bounty in Queens Co., N.B. (S.F. Clarkson).

PURPLE TOP (virus) was found in 7 plants at the Station, Fredericton and in 3 plants in a field in York Co., N.B. The disease is similar to that described in P.D.S. 23:77. (D.J. MacLeod).

STREAK (virus). A field of staked tomatoes in the Burlington area, Ont., showed rather severe symptoms of streak just prior to the time of the first picking (J.D. MacLachlan). A scattered infection was reported by a grower in Prince Edward Co.; report was accompanied by specimens (G.C. Chamberlain).

YELLOWS (Beta virus 1) was found only rarely in the B.C. Interior in 1948 (G.E. Woolliams).

BLOSSOM-END ROT (non-parasitic) was very prevalent in Ont. in 1948 (J.D. MacLachlan). The trouble was prevalent in Essex Co. in the earliest maturing fruit of the canning crop. It also affected 1-2% of fruit in most fall greenhouse crops (C.D. McKeen). Considerable loss was reported in the Niagara Peninsula in the early field crop (J.K. Richardson). It also caused heavy loss (up to 50%) of the early fruit in several plantings of staked tomatoes (G.C. Chamberlain). Heavy losses were reported by a grower at St. Pierre les Becquets, Que.; several cases were also reported from the Montreal district (J.E. Jacques). Blossom-end rot was very destructive in one garden and was present in trace to moderate amounts in others in Queens Co., P.E.I. (R.R. Hurst).

SKIN CRACK (non-parasitic) affected several varieties of the fall greenhouse crop in Essex Co., Ont. Up to 20% of the fruit were affected, the percentage varying according to the cultural conditions under which the crop was grown. All affected fruits are unsaleable (C.D. McKeen).

SUN SCALD (non-parasitic) was quite prevalent during hot dry weather in Ont. in areas where the fruit was exposed by loss of foliage (J.D. MacLachlan).

TURNIP

DRY ROT (Phoma lingam). Infection was severe on two farms in the Gaspereaux Valley, N.S., in fields planted with the same lot of seed; a specimen was sent in for identification (K.A. Harrison).

CLUB ROOT (Plasmodiophora Brassicae). Three severe cases were found in crops near Charlottetown, P.E.I.; losses were about 5, 10, and 50 % of the crop (D.B. Robinson).

STORAGE ROT (Rhizoctonia Solani) caused considerable infection in the roots in a retail store at North Saanich, B.C. (W. Jones).

STERILITY (virus) was common in Swede turnip seed plots in York and Sunbury Counties, N.B. Infection was a trace to 8% (D.J. MacLeod).

WITCHES' BROOM (virus). A trace was found in 3 commercial seed plots of Swede turnip in York Co., N.B. (D.J. MacLeod).

PHOSPHORUS DEFICIENCY. Although this condition has not been previously reported it has been observed for many years in Swede turnip in P.E.I. The dull reddish to purplish tints of the leaf near or at the margin are strikingly like those of phosphorus deficiency (R.R. Hurst).

BROWN HEART or WATER CORE (boron deficiency) was severe in the table turnip areas of Ont. in 1948; a prolonged period of hot, dry weather occurred in mid to late summer. Satisfactory control was obtained by spraying or dusting the crop. In certain fields that were sprayed or dusted, some water core developed but it was usually found that the technique was poor or the application was not made until the crop was too advanced. In some fields the disease was controlled by applying granulated borax with a hand cyclone grass seeder applied at the rates of 30 lb. per acre. This application was made shortly after thinning. Where equipment is not available for either spraying or dusting it is believed that applications of borax after thinning are much more effective than soil applications prior to seeding (J.D. MacLachlan).

WATERMELON

ANTHRACNOSE (Colletotrichum lagenarium). Spores of the organism were present on a specimen of diseased watermelon plants received from Kleefeld, Man. Surface sterilized stem tissues yielded the organism in pure culture. Seedling watermelons inoculated in the greenhouse became lesioned and died, but seedling cucumbers similarly inoculated failed to become infected. Sporulation was abundant on the inoculated watermelon seedlings and from them the organism was re-isolated in pure culture. No setae have been found associated with the ascervuli on the lesions or found in the cultures on artificial media. G. Nicolas and B. Aggery (Comptes rendus Soc. de Biol. 112:125-126. 1933) state that Gloeosporium lagenarium and Colletotrichum oligochaetum Cav. are two stages of the same organism and that setae develop in old infections only (W.A.F. Hagborg). Anthracnose was found in all watermelon fields in Essex Co., Ont., examined and infection was heavy (up to 75% in some). Lesions were so plentiful on the ends of the vines in 2 fields that the tips were killed. Some fruit infection was observed (C.D. McKeen).

POWDERY MILDEW (Erysiphe Cichoracearum) was very common on pumpkins, squashes and watermelons about Guelph, Ont., in the later part of the season (J.D. MacLachlan).

WILT (Fusarium bulbigenum var. niveum) was severe in 3 watermelon fields in the Harrow area, Ont., and up to 70% of the vines were killed in 2 small fields. The organism was isolated and found to be non-pathogenic to muskmelons. Other experiments showed that watermelons are not attacked by the organism isolated from muskmelons in Essex Co. The sudden appearance of the disease in these fields suggested that the pathogen was seed-borne (C.D. McKeen).

STORAGE SOFT ROT of VEGETABLES. Losses from storage rots of vegetables were high in the fall of 1948 in home basements in Sask. This sudden flare-up was probably due to the exceptionally long mild fall when temperatures were high in storage bins. Sclerotinia Rot (S. sclerotiorum) was suspected but Rhizopus sp. developed rapidly all over carrots and cabbages in two cases where material was incubated (T.C. Vanterpool).