III. DISEASES OF VEGETABLE AND FIELD CROPS

ASPARAGUS

RUST (Puccinia Asparagi) was found on garden escapes near irrigation flumes on the Station, Summerland, B.C. (G.E. Woolliams). A slight general infection was noted in a large planting at Morden, Man., on Sept. 14. In a smaller, isolated planting, every stem was covered from top to bottom with lesions, which were not typical of rust. Microscopic examination revealed that the pustules were largely parasitized by Darluca filum. In some instances no urediniospores were present in the lesions, the Darluca apparently completely suppressing the rust. Some of the lesions on the stem were also inhabited by a Coniothyrium sp. (spores 5-7.5 x 2.5-3 microns) (W.L.G.).

FOOT ROT and YELLOWING affected odd plants at Morden, Man.; Fusarium oxysporum was isolated (W.L. Gordon).

BERRY DECAY. Spores of Fusarium Scirpi var. acuminatum were abundant on the shrunken berries at Morden, Man. (W.L. Gordon).

BEAN

GREY MOULD (Botrytis cinerea) was general as a rot on Masterpiece in a garden at the Farm, Agassiz, B.C. (W. Jones). It was fairly prevalent as a pod rot in the variety plots at Beaverlodge, Alta. (G.B. Sanford). Grey mould was present in a large number of plantings of beans in Queens Co., P.E.I. It was believed that the Botrytis was secondary following severe root and cotyledon rot, the cause of which was not determined (R.R. Hurst).

ANTHRACNOSE (Colletotrichum Lindemuthianum). Severe infections were reported in gardens at Edmonton and Vermilion, Alta. (A.W. Henry). Anthracnose was severe on Tendergreen and New Long Tendergreen and moderate on the pods of Round Pod Kidney Wax at Morden, Man.; a trace was recorded at Winnipeg (W.L.G.). The disease was observed in every planting seen in Lincoln Co., Ont., but damage to the pods was insignificant (J.K. Richardson). Anthracnose was prevalent at Guelph on susceptible varieties such as Kidney Bean (J.D. MacLachlan).

In general, anthracnose was less severe than usual in the region of Montreal, Que. Nevertheless a 60% infection was present in some fields among the 30 visited (E. Lavallee). Two fields, moderately infected, were found in 12 inspected in the Montreal district, Que. (R.O. Lachance). Anthracnose affected 75-100% of the pods of the susceptible varieties, Commodore, Stringless Refugee Wax, New Stringless Valentine, Unrivalled Wax, Full Measure, The Prince, Asgrow Stringless, Green Pod and Early Six Weeks at Fredericton, N.B. (S.F. Clarkson). Anthracnose frequently caused severe damage in P.E.I. on a large number of varieties (R.R. Hurst).

BACTERIAL BLIGHTS (Halo Blight, Pseudomonas medicaginis var. phaseolicola and Bacterial Blight, Xanthomonas phaseoli). Halo blight developed to a limited extent in plantings grown from diseased seed at Grand Forks, B.C., but there was no natural spread to healthy plants (G.E. Woolliams). The bacterial

blights were common throughout Alta. and they were reported to have caused severe damage in gardens at Brooks, Edmonton and Wabamun. They were severe on some varieties at Edmonton, Olds, and Lethbridge. "Calapproved" seed obtained from California in 1944 was apparently infected. In tests with this seed at Edmonton and Lacombe, severe infection developed in Black Valentine and Bountiful and there was a trace to slight infection in Dark Red Kidney and Tendergreen (M.W.C.).

Bacterial blight along with halo blight was common in gardens at Saskatoon and in the University plots; moderate damage was caused chiefly by halo blight in Sask. 1966, a field bean. These blights were reported from several other points (H.W.M., T.C.V.). The bacterial blights are the most destructive diseases of beans in Man.; infection was severe throughout Man. (W.L.G.). Halo blight was somewhat later in appearing in 1944 than in 1943, and although it was general, it apparently caused little loss in snap beans in Lincoln Co., Ont. (J.K. Richardson). Bacterial blight was epidemic and caused severe damage to string beans in the Leamington district, Ont. (L.W. Koch). Bacterial blight infection varied from 15 to 100% in the 30 fields examined in the Montreal district, Que. The severity of the disease was distinctly related to the source of seed. The disease causes heavy losses in gardens and in fields of canning beans (E. Lavallee). The situation was similar in plantings being grown for seed in the Montreal district (R.O. Lachance). A trace of halo blight was recorded in one planting and bacterial blight infection was a trace to 10% in others in Queens Co., P.E.I. (R.R. Hurst).

STEM ROT (Rhizoctonia Solani). Affected specimens were received from Vernon, B.C. (G.E. Woolliams).

SCLEROTINIA ROT (S. sclerotiorum) affected about 1% of the pole bean plants being grown for seed in a planting at Vernon, B.C. (G.E. Woolliams). It was severe on bush beans in low spots in a field at Vernon, B.C. (H.R. McLarty). The disease occurred as a pod rot in the variety tests at Beaverlodge, Alta. (G.B. Sanford).

MOSAIC (virus) was fairly general among market gardens in Lincoln Co., Ont. (J.K. Richardson). Mosaic affected about 1% of the plants of Canadian Wonder, Kidney Red and Commodore, while 50% of the Tapery bean (Phaseolus acutifolius var. latifolius) were diseased in the Botanical Garden, Montreal, Que. (J.E. Jacques). Mosaic was found in a few fields in the Montreal district, the highest infection being 5% in a field at Iberville (E. Lavallee). Infection was moderate in 2 plantings at the Station, Fredericton, N.B. (D.J. MacLeod); and a trace in a planting in Queens Co., P.E.I. (R.R. Hurst).

FROST, in June, caused severe damage, with the result that much of the crop required replanting in Queens Co., P.E.I. (R.R. Hurst).

BROAD BEAN

SEED ROT. Seed imported from California germinated poorly when sown at Winnipeg, Man. Interior was affected by soft rot bacteria and Penicillium grew abundantly on the outside (J.E. Machacek).

MOSAIC (virus). A trace was found in one garden in Fredericton, N.B. (D.J. MacLeod).

POD BLACKENING. A blackening of pods and leaves was very severe on broad beans in the test plots at Summerland and in the southern Okanagan Valley, B.C. It is thought to be caused by unfavourable weather conditions; the crop cannot be grown successfully here on account of this trouble (H.R. McLarty).

BEET

SCAB (Actinomyces scabies) affected up to 25% of the roots, many severely so, in gardens at Kentville, N.S. (J.F. Hockey). Traces of scab were present in one planting in Queens Co., P.E.I. (R.R. Hurst).

LEAF SPOT (Cercospora beticola) was reported as follows: general on the foliage of garden and seed crops in the coastal section of B.C. (W. Jones); infection slight to severe in the University plots, Edmonton, Alta. (M.W.C.); traces at Morden and Winnipeg, Man. (W.L. Gordon); moderate infection on Flat Egyptian, little or none on Detroit Dark Red in plots, Division of Horticulture, C.E.F., Ottawa, Ont. (D.B.O. Savile); general, but causing little damage in the Montreal district, Que. (E. Lavallee); severe infection on Crimson Globe in Queens Co., P.E.I. (R.R. Hurst).

BLACK LEG (Phoma Betae). A slight infection as a leaf spot was present at Grand Forks, B.C. (G.E. Woolliams). Black leg was severe in beets in storage at Portage la Prairie, Man.; some of the remaining beets rotted completely in the soil when planted (J.E. Machacek).

DOWNY MILDEW (Peronospora Schachtii) caused severe damage to 3 seed crops in the Fraser Valley, B.C. in May; systemic and secondary infections were prevalent. The disease was also prevalent on the foliage of stecklings for next year's crop in late summer and autumn in the same areas (W. Jones).

RUST (Uromyces Betae) was general in a few gardens in North Saanich Co., B.C.; the damage was slight (W. Jones).

MOSAIC (Beta virus 2). Two plants affected by mosaic were found in a plot at the Fredericton Station, N.B. (D.J. MacLeod).

CROWN ROT (boron deficiency) affected a root here and there in plantings in Queens Co., P.E.I. (R.R. Hurst).

BROCCOLI

BLACK LEAF SPOT (Alternaria oleracea). Infection was general on the leaves and to some extent on the pods of Foundation seed plants of Italian Green Sprouting broccoli at the Farm, Agassiz, B.C. (W. Jones).

DOWNY MILDEW (Peronospora Brassicae). Infection was general on the foliage in Jan. 1944 at the Station, Sidney, B.C. (W. Jones).

CABBAGE

BLACK LEAF SPOT (Alternaria oleracea) slightly infected the leaves of Foundation seed plants of Copenhagen Market at the Farm, Agassiz, B.C. (W. Jones). A moderate infection was found in a garden at Edmonton, Alta. (L.E. Tyner).

The pods of Penn. State were moderately to severely spotted by an Alternaria in a planting in Kamouraska Co., Que. (R.O. Lachance).

DOWNY MILDEW (Peronospora Brassicae) was sporulating abundantly in January on foliage of plants set out for seed production, at the Station, Sidney, B.C.; the plants became infected while they were still in flats in cold frames. Downy mildew was also severe on the foliage and general on the pods of Copenhagen Market at Brentwood. Air drainage was poor in the field (W. Jones).

BLACK LEG (Phoma lingam) caused severe damage in most greenhouses where seed was untreated in Essex Co., Ont. Some of the infected plants went unnoticed until after they had become established in the field (L.W. Koch).

CLUB ROOT (Plasmodiophora Brassicae). A slight infection was observed at Armstrong, B.C. (G.E. Woolliams). Club root is the most important disease of cabbage on the Islands of Montreal and Jesus, Que.; losses vary from a trace to 80% (E. Lavallee). A slight, general infection was observed in a planting of Late Flat Dutch in Queens Co., P.E.I. (R.R. Hurst).

BACTERIAL LEAF SPOT (Pseudomonas maculicola) was fairly heavy on a single leaf of red cabbage from the prisoner-of-war camp, Bowmanville, Ont.; the seed was of German origin (L.T. Richardson).

SCLEROTINIA ROT (S. sclerotiorum). An entire lot of Danish Ballhead in storage became affected and were rendered useless in Queens Co., P.E.I. (R.R. Hurst).

BLACK ROT (Xanthomonas campestris). Half of the plants in a plot of Foundation seed were affected in the Pike Lake district, Sask. (R.J. Ledingham, W.A.F. Hagborg). Black rot caused severe damage on cabbage in the Winnipeg area (Fort Garry, East St. Paul and St. Vital) and at Morden, Man. This is the first report of black rot on cabbage to the Survey from Man. (W.L. Gordon). A slight infection of black rot was found on Danish Ballhead plants growing in close proximity to infected turnips at the St. Catharines Laboratory, Ont. (J.K. Richardson).

BROWN HEART (boron deficiency). A trace was seen in one planting in Queens Co., P.E.I. (R.R. Hurst).

FROST. Plants were checked in one low-lying field at Brentwood, B.C. (W. Jones).

CARROT

LEAF BLIGHT (Alternaria Dauci) was general in one garden and caused moderate damage to the foliage at Agassiz, B.C. (W. Jones). The disease was present on a specimen received from Br. M.-Anselme, Mont Rolland, Que. (I.L.C.).

BLACK ROT (Alternaria radicina) was developing at Grand Forks, B.C., in January, among roots grown from untreated seed or from treated seed, but where the roots had been put in unsterilized storage houses; no rot was showing among roots grown from treated seed and stored in either new storage houses or ones that had been properly disinfected (G.E. Woolliams). Black rot was severe in storage at Portage la Prairie, Man. (J.E. Machacek).

ROT (Botrytis cinerea) was severe in a grocery store, Charlottetown, P.E.I., in carrots brought into the province (R.R. Hurst).

LEAF SPOT (Cercospora Carotae). Some fields were quite severely affected in the Armstrong district, B.C., by leaf spot, both the blades and the petioles being attacked. Only the central younger leaves were unaffected, while older leaves died prematurely. This is the first year the disease has been observed in the Interior of B.C. (G.E. Woolliams). Infection was moderate to quite severe on Chantenay stecklings in a plot of the Division of Horticulture, C.E.F., Ottawa, Ont. in that part near an overhead irrigation pipe; at a greater distance the infection was slight and scattered. No Cercospora was seen on stecklings of Amsterdam and Imperator in adjoining plots (R.G. Atkinson). Infection was moderate in a private garden at Ottawa and at Cyrville (D.B.O. Savile, L.T. Richardson); and fairly severe on material received from Br. M.-Anselme at Beauceville, Que. (I.L.C.).

SCLEROTIAL ROT (S. sclerotiorum). Two affected roots were received on Nov. 20 from the Division of Horticulture, C.E.F., Ottawa, Ont. (H.N. Racicot).

BACTERIAL BLIGHT (Xanthomonas carotae) was general in the seed crops of all varieties, especially at Grand Forks and at Kelowna, Vernon, Armstrong, and other points in the northern Okanagan Valley, B.C. Infection was mostly confined to the leaves in 1944, although there was also some blighting of the umbels. The disease also affected the leaves of the root crop; infection of the roots has not been observed (G.E. Woolliams). Bacterial blight was widespread on plantings of several varieties in East St. Paul, Winnipeg, Man.; infection was general but moderate at Morden and a trace at Brandon (W.L.G.). About 10% of the plants were noticed to be yellowing and wilting in a plot of Chantenay of the Division of Horticulture, C.E.F., Ottawa, Ont. The roots were easily pulled up and the secondary roots were mostly rotted away, while at their point of origin black sunken lesions occurred. The plants eventually succumbed. Only a trace of bacterial leaf blight was noticed (R.G. Atkinson). Bacterial blight as it appeared on these roots agreed well with the account given by P.A. Ark and M.W. Gardner (Phytopathology 34(4):416-420. 1944) of the bacterial blight organism on the carrot root in California. According to them the disease is carried by the seed from infected umbels and may be controlled by 10 min. in hot water at 52° C. or 10 min. in 1:1000 bichloride of mercury. In the Soledad area of California, soil infection rendered the hot water treatment of commercial seed ineffective (I.L.C.). Bacterial blight caused 20% defoliation in a small garden in Westboro, Ont. by the end of July (D.B.O. Savile).

YELLOWS (Callistephus virus 1). About 10% of the stecklings planted out in the Grand Forks area, B.C., showed infection in the spring; affected plants were rogued out early in the season and in July the disease could not be found in the seed crop. In September, yellows was found in the steckling crop, infection varying from 2 to 50% (G.E. Woolliams). A trace to 5% of the plants were affected by yellows in several gardens at Edmonton, Alta. In one garden, 70% of plants from seed of South American origin were affected, while plants in adjacent plots from other sources were healthy (G.B. Sanford). Yellows affected 7% of the carrots in a field southwest of Edmonton and although no counts were recorded, it appeared to be about equally prevalent in the Lethbridge district. Yellows has been observed on carrots for several years, but it appeared to be more prevalent this year than in the past. Yellows was also prevalent in China asters in most parts of Alta. this year and what appeared to be the same disease was noted on petunia, clarkia, marigold and cosmos (G.F. Manson).

Yellows was common and moderate to severe throughout Sask. (H.W.M.). Carrot yellows was first seen on July 15. About 25 plantings were seen during the summer, mostly at Saskatoon, but also at Regina, Moose Jaw and Indian Head. Officers of the Entomological Laboratory also reported yellows at Emma Lake, Craven and Battleford. The average infection was placed at 30%. According to Dr. A.P. Arnason, leaf hoppers were unusually abundant this year (R.J. Ledingham). The disease was widespread in Man. and in many instances severe; up to 100% of the plants being affected (W.L.G.). Over 90% of the carrots were affected by yellows in a half-acre planting in the Holland Marsh, Bradford; the planting was near a crop of potatoes (J.K. Richardson, H.N. Racicot). Yellows was affecting a trace (about 1 in 800) of the stecklings in the plots of the Division of Horticulture, Ottawa, on Aug. 30. Infection apparently occurred late in the season; the yellowed plants were best recognized by the marked development of fine secondary roots along the main root (R.G. Atkinson). A trace was also found in 2 out of 3 fields inspected in the Ottawa area (L.T. Richardson). Yellows is widespread in the Montreal district, Que. At Rosemont, 50% of the carrots were affected in one planting (E. Lavallee, H.N. Racicot). At the Substation, Ste. Clothilde, Chateauguay Co., a trace of yellows was present on July 13 in a seed crop of about ¼ acre; however, about 1% were rogued out in the spring. No yellows was found in other plants, although a thorough search was made. By Aug. 18, 1-2% of the carrots being grown as stecklings for next year's crop had become affected by yellows, and had been rogued out (H.N. Racicot). The low incidence of the disease is believed to be due according to F.S. Browne, Division of Horticulture, to a good kill of the early leaf hoppers. The seed crop was sprayed when the plants were about 6 inches high and as the first leaf hoppers began to be noticed. Under his direction, nicotine sulphate with a casein spreader was applied to the foliage at the rate of 1 qt. of nicotine sulphate to 100 gal. of water. About 12 oz. of the casein spreader were emulsified in a small amount of water and added to each 100 gallons. The spray was applied under about 40 lb. pressure with a boom covering several rows at one time fitted with fine nozzles. The spraying was done in the evening when there was no wind. The spray issued from the nozzles in a very finely dispersed condition. As the sprayer moved through the field the hoppers were disturbed and were soon wet flying through the mist surrounding the sprayer. The same materials were added to the Bordeaux and poison applied to potatoes and celery (I.L. Conners).

Yellows was general in fields in York, Sunbury, Queens, Kings, Westmorland, Albert and Carleton Co., N.B.; infection varied from 2 to 27% (D.J. MacLeod). Carrot yellows was more prevalent in N.S. in the dry year of 1944 than in the wet season of 1943. A survey of 20 commercial plantings revealed yellows affecting 1.5-41% of the plants, most fields averaging 15-20%. In the variety trials at Kentville, 4 months after seeding the infection was: Amsterdam Ottawa C 28%, Touchon 23.5%, Imperator 19.6%, Imperator E 265, 15.5%, Stokes Supreme Danvers 15%, Tendersweet 10.6% and Chantenay Ottawa E 10.3%. Yellows was most prevalent in the wild hosts, Leontodon, Plantago, Chrysanthemum, Matricaria, Daucus and Taraxacum, but it was also found in Spergula, buckwheat and lettuce (J.F. Hockey). Almost 100% of the carrots in a planting of Chantenay and Danvers Half Long in P.E.I. were affected by yellows and virtually worthless; yellows was also noticed in several gardens at Charlottetown (R.R. Hurst).

CAULIFLOWER

GREY MOULD (Botrytis cinerea) was prevalent in several seed crops in the Victoria district, B.C., and caused moderate damage as a die back of some of the seed-bearing stalks (W. Jones).

SOFT ROT (Erwinia carotovora). Two plants affected by soft rot were brought to the Charlottetown Laboratory, P.E.I. for diagnosis (R.R. Hurst).

CLUB ROOT (Plasmodiophora Brassicae) is the most important disease of cauliflower in the Montreal district, Que.; losses vary from slight to severe (E. Lavallee). A slight general infection occurred in Snowball in a garden at Charlottetown, P.E.I. (R.R. Hurst).

WIRE STEM (Rhizoctonia Solani) was common on and caused moderate damage to young plants in flats at Victoria, B.C., which were later to be set out for stecklings (W. Jones). About 5% of 3,000 cauliflower plants were severely lesioned at the base at Winnipeg, Man. on May 17 (W.A.F. Hagborg). Wire stem is often found in hot beds in the Montreal district, Que. Damage is usually severe where the soil has not been disinfected with formalin (E. Lavallee).

BLACK ROT (Xanthomonas campestris) caused severe damage in St. Vital, Winnipeg, Man.; about 40% of the plants were unsaleable, while the others were lightly infected (J.E. Machacek). Some leaf infection was noted on cauliflowers growing near infected turnips in Lincoln Co., Ont. (J.K. Richardson).

MOSAIC (virus). About 5% of the plants in a seed crop of Veitch's Autumn Giant were affected in the Victoria district, B.C. (W. Jones).

BROWN HEART (boron deficiency). In one planting of Snow Queen in Queens Co., P.E.I., 65% of the plants were severely affected by brown heart; the trouble was also seen on cauliflowers for sale on the market and in stores at Charlottetown (R.R. Hurst).

CURD ROT (complex, followed by Erwinia carotovora) was severe in 1 seed crop of Snowball and slight in several other seed crops in the Victoria district, B.C. (W. Jones).

CELERY

EARLY BLIGHT (Cercospora Apii). A moderate infection of early blight developed late in the season in the Laboratory plots, St. Catharines, Ont., but late blight was not observed (J.K. Richardson). A 50% infection caused moderate damage in a planting in York Co., N.B. (J.L. Howatt).

ROOT ROT (Rhizoctonia Solani, etc.) caused slight damage in a planting in York Co., N.B. (J.L. Howatt).

LATE BLIGHT (Septoria Apii-graveolentis) caused considerable damage in a few truck gardens about Victoria, B.C. (W. Jones). The disease was present this year in the Armstrong district, B.C., but was easily controlled where the plants were adequately sprayed (G.E. Woolliams). Late blight was somewhat less prevalent in 1944 than in the previous year in Lincoln Co., Ont., probably on account of the low precipitation early in the summer (J.K. Richardson). Late blight was widespread in the Montreal district, Que.; infection became severe particularly towards the end of the season (E. Lavallee). Late blight was heavy on two leaves received from Br. M.-Anselme from Beauceville, Que. (D.B.O.S.). A trace was recorded in a planting in York Co., N.B. (J.L. Howatt).

YELLOWS (Callistephus virus 1). Several plants were moderately affected in the plots at Lethbridge, Alta. (M.W.C.). Yellows was found affecting celery plants brought to the Laboratory by Mr. Kerr, Superintendent, Forest Nursery Station, Sutherland, Sask. on Aug. 5. Some 6 plants were so affected in a planting of 50-75, and the disease appeared to be spreading, particularly to adjacent plants (R.J. Ledingham).

BLACK HEART (non-parasitic) caused moderate damage to several varieties at the Forest Nursery Station, Sutherland, Sask. (H.W.M.). Black heart affected 75% of Paris Golden in a planting in Grey Co., Ont.; it caused severe loss in early planted celery, the weather being very warm and dry during July and August (G.C. Chamberlain). Masterpiece and Paris Golden were severely affected at the end of July and were a total loss at the Botanical Garden, Montreal, Que. (J.E. Jacques). One lot of celery was a complete loss in storage in January in Queens Co., P.E.I. (R.R. Hurst).

BORON DEFICIENCY was general throughout one seed crop in Queens Co., P.E.I., but was worse in patches. Affected plants showed a die-back (R.R. Hurst).

CELTUCE

LEAF SPOT (Alternaria sp. inedit) was found intermixed with spots due to Septoria Lactucae (see below) at Morden, Man. by W.L. Gordon. From a specimen kindly supplied by Dr. Gordon, spores were removed by J.W. Groves to inoculate successfully seedlings of celtuce and lettuce. Parallel inoculations from a culture of an Alternaria originally isolated from lettuce seed by Dr. Irene Mounce of the Saanichton Laboratory, B.C., proved that the two isolations were identical. The spores were those of an Alternaria of the large-spored

type, which Dr. Groves believes is probably an undescribed species. While Dr. Gordon recognized its close resemblance to A. Solani, it would seem better for the sake of uniform usage to refer to it as a species of the Brassicae type as done by Groves and Skolko for their new A. linicola (see p.27) and others (I.L. Conners).

LEAF SPOT (Septoria Lactucae). A moderate infection was found on some seed plants at Morden, Man. (W.L. Gordon). The host, is new to the Survey; the spores measured 19-31 x 1.4-1.6 microns (D.B.O. Savile).

CUCUMBER

SCAB (Cladosporium cucumerinum) was found causing slight damage to Perry's Special in greenhouses in Essex Co., Ont. in April and May; the later formed fruits were more frequently attacked than the early ones (L.W. Koch). Scab infection was severe and the damage considerable in several plantings in the Maugerville and Jemseg districts, N.B. (S.F. Clarkson).

ANTHRACNOSE (Colletotrichum lagenarium) severely affected a few plantations of cucmbers and muskmelons in Essex Co., Ont., and it appeared only late in the season. The disease was much milder than usual (L.W. Koch).

BACTERIAL WILT (Erwinia tracheiphila). A scattered infection was reported throughout a 5-acre field at Agincourt, Ont. (L.T. Richardson). Severe outbreaks were found in a few fields in the Montreal district, Que. (E. Lavallee). A slight infection occurred at the Station, L'Assomption, Que. (R.O. Lachance).

POWDERY MILDEW (Erysiphe Cichoracearum) caused moderate damage to Perry's Special in a greenhouse in Essex Co., Ont., in May (L.W. Koch).

WILT (Fusarium spp.) affected less than 1% of the plants in a planting at Summerland, B.C., but the affected plants died; the disease was much less severe than last year (H.R. McLarty). Wilt caused about 1% damage in the plots at Edmonton, Alta. (G.B. Sanford). The disease affected about 5% of a 1/8-acre planting in Lincoln Co., Ont. (J.K. Richardson).

ROOT KNOT (Heterodera marioni) was severe in one greenhouse at Haney, B.C. (R.J. Hastings).

ANGULAR LEAF SPOT (Pseudomonas lachrymans) was severe on a specimen sent from Brandon, Man., by Dr. Bird (W.A.F. Hagborg, W.L. Gordon). A moderate infection occurred in localized areas in plantings with an overhead watering system in Essex Co., Ont. (L.W. Koch).

MOSAIC (virus). All plantations of cucumbers and muskmelons in Essex Co., Ont., showed some infection, the highest being 7% (L.W. Koch). A trace of mosaic (Cucumis virus 1) was present in 1 field in Sunbury Co., N.B. (D.J. MacLeod). A trace was seen in one planting in Queens Co., P.E.I. (R.R. Hurst).

FRUIT CHLOROSIS (cause unknown). In a small isolated planting at the Laboratory, St. Catharines, Ont., many of the fruits were a pale greyish yellow,

which was visible shortly after the fruit had set. The chlorotic fruits appeared to develop normally, but turned a greyish white instead of yellow when they ripened. Both normal and chlorotic fruits were present on some vines, while almost all the fruits were affected on others (J.K. Richardson).

FROST caused severe damage to cucumbers in Queens Co., P.E.I., in June, with the result that much of the crop had to be replanted (R.R. Hurst).

EGG PLANT

LEAF SPOT (*Alternaria Solani*). Infection was severe and general on Kissin and Hampshire 101-7-7 in the plots at Morden, Man. The disease was noted on the plants while they were still in the seed bed (W.L. Gordon).

FOOT ROT (*Rhizoctonia Solani*). A severe infection was reported in St. Vital, Winnipeg, Man. The pathogen was isolated (J.E. Machacek).

WILT (*Verticillium Dahliae*) affected about two thirds of the plants of Black Beauty in a plot at the Station, Summerland, B.C. (G.E. Woolliams, J.W. Groves).

HOPS

DOWNY MILDEW (*Pseudoperonospora Humuli*). A moderate infection was observed on hops at Brandon and Morden, Man. The disease was previously found in Man. in 1928 (W.L. Gordon). The early infection was as severe as in previous years in the Cazaville district, Que., but the disease was kept under much better control than formerly due apparently to the use of Bordeaux spray instead of a copper-lime dust (L.J.S. Laporte).

POWDERY MILDEW (*Sphaerotheca Humuli*) caused slight damage in well dusted fields in the Cazaville district, Que.; severe damage was seen in only one field, where almost no sulphur was applied (L.J.S. Laporte).

HORSE-RADISH

WHITE RUST (*Cystopus candidus*) was severe on horse-radish at the Botanical Garden, Montreal, Que.; the leaves were spotted, malformed and distorted (J.E. Jacques).

LEAF SPOT (*Ramularia Armoraciae*). A moderate infection occurred on plants in a garden where sprinklers were used, in the Summerland district, B.C. (H.R. McLarty).

LEEK

SOFT ROT (*Erwinia carotovora*). In a seed plot of the Division of Horticulture, C.E.F., Ottawa, Ont., 25 out of 144 seed stalks were affected by soft rot, the seed heads were poorly developed (R.G. Atkinson).

LETTUCE

LEAF SPOT (Alternaria sp. inedit). See discussion under Celtuce (p. 44).

DOWNY MILDEW (Bremia Lactucae) was general on New York 12 and caused moderate damage at Agassiz, B.C. On the other hand it caused only slight damage on the same variety at Sidney. The greater damage caused at Agassiz is attributed to the higher humidity prevailing at this point (W. Jones). Downy mildew was prevalent on the basal leaves of New York 515 at Armstrong. The disease was doubtlessly checked by the hot dry weather in July after a period of cool, showery weather during the spring months (G.E. Woolliams).

BOTTOM ROT (Rhizoctonia Solani) caused severe damage in some plantings in the Sarnia district, Ont. (L.W. Koch).

DROP (Sclerotinia sclerotiorum) caused moderate to severe damage in several gardens at Edmonton, Alta. Infection varied from a trace to severe in the varietal plots at Lacombe (M.W.C.). The disease caused slight damage in a garden at Saskatoon, Sask. (R.J. Ledingham).

LEAF SPOT (Septoria Lactucae Pk.). The discovery of this leaf spot on celtuce (q.v.) has lead to a study of the pathogen. Its correct name is Septoria Lactucae Peck, which was published in June 1879 whereas S. Lactucae Passer. used in P.D.S. 21:36, appeared in Oct. 1879. There is little doubt that these organisms as well as S. consimilis, S. lactucicola, S. Ludoviciana and S. unicolor are identical, having spores variously described as 1 to 2.5 microns wide. S. Mulgedii, with spores 4 microns wide, is evidently distinct (D.B.O. Savile).

YELLOWS (Callistephus virus 1) affected 1% of the plants of New York 12 in a seed plot at the Station, Summerland, B.C. (G.E. Woolliams). Yellows infected 7% of the plants in a late planting on a farm in Sunbury Co., N.B. Yellows was common on Leontodon autumnalis and Plantago major near this field of lettuce. Four severely affected plants were also noted in a plot at Fredericton, N.B. (D.J. MacLeod). An estimated 44% of the plants were affected in a planting at North Kingston, N.S., on Sept. 8. The planting was too old to be of any value (J.F. Hockey).

TIP BURN (non-parasitic) was observed at Grand Forks, Kelowna, and other points in the Interior of B.C.; the amount of injury varied from field to field, but in none did it exceed 20%. In a seed plot of New York 12 at Summerland, 95% of the plants were affected (G.E. Woolliams).

MELON

BACTERIAL WILT (Erwinia tracheiphila) was observed in Essex Co., Ont.; the damage was negligible (J.J. Miller).

ANTHRACNOSE (Colletotrichum lagenarium) severely infected and damaged

WILT (Fusarium spp.) affected up to 10% of the plants in fields of muskmelons in Essex Co., Ont. Watermelons growing in fields adjacent to those containing wilting muskmelons invariably showed no evidence of Fusarium wilt. Isolations of the pathogen were obtained (J.J. Miller). Although wilt was much less severe in the Aldershot area, Ont., than in 1943, losses were rather severe in some fields due to the death of vines just prior to cropping (J.K. Richardson).

DAMPING OFF (Pythium sp.) caused the loss of 10% of the potted plants in the late seedling stage in the greenhouse at the Station, Sidney, B.C.; the soil had not been sterilized and growing conditions were warm and moist (W. Jones).

FROST caused severe damage in June to melons in Queens Co., P.E.I. (R.R. Hurst).

ONION

PURPLE BLOTCH (Alternaria Porri) was very destructive to seed plants at Morden, Man. (W.L. Gordon). A specimen collected at Mont Rolland, Que., was received from Br. M.-Anselme (I.L.C.).

NECK ROT (Botrytis Allii) caused slight damage to White Portugal at the Station, Sidney, B.C. in October (W. Jones). The disease was quite general in Yellow Globe Danvers, Mountain Danvers and White Portugal onions in common storage in April in the Okanagan Valley and at Grand Forks, B.C.; losses ranged from 5 to 25%. Little loss from neck rot occurred in onions in cold storage. The new growth from bulbs set out for seed was attacked at the ground line in May, in several localities including Grand Forks, Tappen and Vernon. A cool backward spring apparently provided favourable conditions. Almost 1% of the scapes became lesioned late in the season just below the seed head in a field of Yellow Globe Danvers at Lavington, causing many of them to fall over (G.E. Woolliams). Neck rot caused moderate damage during curing and storage of several lots of onions at Edmonton, Alta. (M.W.C.).

SMUDGE (Colletotrichum circinans). Affected specimens of a white skinned variety were received from Welland Co., Ont. (G.C. Chamberlain).

BULB ROT (Fusarium oxysporum f. Cepae) was severe in 2 fields at Duncan, B.C. (W. Jones). Bulb rot, which is general in the Kelowna district, affected 3% of the bulbs of Yellow Globe Danvers and White Portugal in a field examined (G.E. Woolliams).

DOWNY MILDEW (Peronospora destructor) caused slight damage at Agassiz, B.C. In 1943 the disease was severe in the seed crop at the Sidney Station. Young bulbs were also affected. These young bulbs were planted for seed in 1944, but mildew was not found on the plants; the weather was dry throughout the growing season (W. Jones). Downy mildew was present again in the Grand Forks district and also occurred in the Okanagan Valley from Kelowna northward. Infection on the seed crops varied from slight to severe and in a few cases the disease caused a severe reduction in yield. Later in the season

mildew developed on the bulb crop in some fields but caused little reduction in bulb size (G.E. Woolliams). Downy mildew was severe in one garden at Edmonton, Alta. (G.B. Sanford). A trace was present in July in a seed crop at the Substation, Ste. Clothilde de Chateauguay, Que.; diseased plants are rogued out as they appear (H.N. Racicot); in August the infection was moderate and the damage slight at the same place (R.O. Lachance).

LEAF SPOT (Pleospora herbarum (Stemphylium botryosum) was general on seed stalks following downy mildew infection at Agassiz, B.C. (W. Jones).

SMUT (Urocystis Cepulae). Diseased specimens were received from Rosemont, Que. (L.T. Richardson). Smut affected 50% of the plants causing severe damage in a field at St. Laurent; the disease is apparently spreading for it was previously known only at St. Michel and Rosemont (E. Lavallee).

YELLOWS (Callistephus virus 1). What appeared to be aster yellows was found on onions in 1943 in some of the fields, where the crop was being grown for seed, in the Grand Forks area, B.C. The disease was definitely distinct from the loosely developed heads, considered to be a genetic weakness, that have been observed occasionally for several years in all sections of the Interior. Moreover, the new disease on onions was confined to the Grand Forks area, where yellows was present on carrots, parsnips and lettuce. In fact carrot yellows was quite prevalent in the district and was present in nearby fields of carrots. There can be little doubt that it was aster yellows for the symptoms appear to be identical with the disease described and illustrated by Russell Larson and J.C. Walker (Wis. Agr. Exp. Sta. Bull. 463, May, 1944). Affected heads are sterile. The disease was not seen in 1944, but observations were more limited this past season (G.E. Woolliams).

Aster yellows was first observed in Man. on Aug. 2, 1944, when it was found in a field of Yellow Globe Danvers in East St. Paul. Later the disease was seen repeatedly in both onions grown for seed as well as for sets in the Winnipeg area. The disease apparently attacks onions in all stages of growth. In young plants the leaves are upright and virescent, while the necks are thickened and the bulbs fusiform. In seed-bearing plants, one or more stalks may be virescent and the flower head may be completely, or only in part, affected. The disease appears to be the same as that described for aster yellows on onions in U.S.D.A. Farmers' Bull. 1060 (revised June, 1944) (J.E. Machacek). Specimens from both B.C. and Man. were received; they agree well with the description and illustration in Bull. 1060. The disease has now been observed in Wisconsin, Idaho (Bull. 1060) and in Maine and Massachusetts (Pl. Dis. Reporter 28(28):882. 1944) (I.L. Conners).

PARSNIP

SCAB (Actinomyces scabies). A few scab lesions were present on Hollow Crown parsnips grown in the Laboratory disease garden, Charlottetown, P.E.I. (R.R. Hurst).

LEAF SPOT (Ramularia Pastinacae) was general in seed crops in the coastal section of B.C.; the damage was slight (W. Jones). A slight infection was reported in stecklings at Armstrong, B.C. by Geo. Perry, Dom. Seed Inspector

(G.E. Woolliams). A slight infection was present in a garden at Winnipeg. Both spore states were obtained from the same spot (W.L. Gordon). A trace was observed at North Kingston, N.S. (J.F. Hockey).

SCLEROTINIA ROT (S. sclerotiorum). A slight outbreak occurred in some parsnips in storage in Queens Co., P.E.I. (R.R. Hurst).

MOSAIC and WITCHES' BROOM (virus) each affected a few plants in a private garden, Saskatoon, Sask. (T.C. Vanterpool).

YELLOWS (Callistephus virus 1) affected a small number of plants in seed crops in the Grand Forks area, B.C. (G.E. Woolliams). Yellows was severe on Hollow Crown at Morden, Man.; it also affected the odd plant at Brandon (W.L. Gordon). A trace was present in a plot at the Station, Fredericton, N.B., and in a field in Queens Co. (D.J. MacLeod). Yellows infected 4.5% of the parsnips in a 1½ acre field of Hollow Crown within 25 yards of a carrot field with 41% of the plants affected by yellows at North Kingston, N.S. (J.F. Hockey).

PEA

LEAF and POD SPOT (Ascochyta Pisi). A trace was found in Alta. in 7 fields and a slight infection in 5 out of 25 fields of peas, which were grown for export to the United Kingdom. Infection was slight to moderate in several gardens at Edmonton and in the plots at Lacombe, Lethbridge and Olds (M.W.C.). A survey of the Nipawin pea area revealed the disease present in very small amounts; a slight infection was also recorded in a garden and in the University plots, Saskatoon, Sask. (H.W.M.). A trace was recorded at Canard, N.S. (J.F. Hockey) and in Queens Co., P.E.I., where the disease was unimportant in 1944 (R.R. Hurst).

LEAF SPOT (Cladosporium pisicola). A trace was observed in Queens Co., P.E.I. (R.R. Hurst).

POWDERY MILDEW (Erysiphe Polygoni) was present on most garden varieties at Summerland, B.C., but it did not seriously affect production this year; it was not serious in field plantings in the Armstrong district (H.R. McLarty). Infection was a trace in 3 fields, slight in 2 and moderate in 1 out of 25 examined (see above) in Alta. The disease was severe in several gardens at Edmonton and slight at Beaverlodge (M.W.C.). Powdery mildew was moderate in 2 fields in Man.; a slight infection occurred on some plants of Australian winter peas in a plot at Morden (W.L.G.). A trace was recorded in one planting in Queens Co., P.E.I. (R.R. Hurst).

WILT (Fusarium spp.) caused severe damage in one field on Lulu Island, B.C. (W. Jones). A very heavy root rot infection was present in foundation stock in the plots, Division of Horticulture, C.E.F., Ottawa, Ont., probably on account of the high temperatures prevailing. In eleven varieties from 30 to 100% of the plants were affected. In the other 7 in the block, infection was very slight in Smallton, a trace in Laxal and confined to a few plants in Entel, Linblue, Robany, Tiny and Tomall (R.G. Atkinson).

MYCOSPHAERELLA BLIGHT (M. pinodes (Ascochyta pinodes). A trace was present on the leaves of Australian winter peas at Morden, Man. (W.L. Gordon).

DOWNY MILDEW (Peronospora Pisi) occurred to a limited extent only in the north Okanagan Valley, B.C. (G.E. Woolliams).

BACTERIAL BLIGHT (Pseudomonas pisi) was found on peas growing in the north Okanagan Valley, B.C., and sent to the Laboratory by H.E. Waby, District Agriculturist. The seed originated outside the province. This is the first record of its occurrence in the B.C. Interior, although it is probable that disease has occurred before on imported seed (G.E. Woolliams). Infection was trace in 5 fields, slight to moderate in 2 and severe in 2, located at Rainier, Alta., on Gradus and Little Marvel. Infection was also a trace to moderate in the garden plots at Edmonton and a trace in Early Blue field peas at Lacombe (M.W.C.). Bacterial blight was moderate in 2 and severe in 3 fields in Man.; a general moderate infection occurred on Australian winter peas at Morden (W.L.G.).

ROOT ROT (Rhizoctonia Solani) caused moderate damage in 2 fields at Rainier, Alta. (M.W.C.). A moderate infection was observed in a planting at Portage la Prairie, Man.; patches of the plants were unthrifty and some were wilted. Brown cankers were present at the base of the stems. A slight infection occurred at Winnipeg (J.E. Machacek).

LEAF BLOTCH (Septoria Pisi). Infection was a trace to slight at Lacombe, Alta. and a trace at Beaverlodge and Bon Accord (M.W.C.). A slight infection was present at Saskatoon, Sask. (H.W.M.) and on garden peas at Morden, Man. (W.L.G.).

RUST (Uromyces Fabae). A slight infection was found in one garden in North Saanich, B.C. (W. Jones). A heavy infection occurred on American Wonder in a garden in Queens Co., P.E.I. (R.R. Hurst).

MOSAIC (Pisum virus 2). A trace was present in 3 private gardens in Fredericton, N.B. (D.J. MacLeod). Mosaic affected 2 plants in a 50 ft. row in Queens Co., P.E.I. (R.R. Hurst).

ROOT ROT (complex cause) caused considerable damage in a few fields on Lulu Island, B.C.; Rhizoctonia was prevalent on the affected root tissue (W. Jones).

MARSH SPOT (manganese deficiency). Severely affected peas grown in the Montreal district, Que., were brought in for diagnosis. Soil analysis revealed a highly alkaline reaction (pH 8.2), which would seem sufficient to immobilize the manganese in the soil (J.E. Jacques).

PEPPER

LEAK (Pythium ultimum) affected less than 1% of the plants of California Wonder in a plot at the Station, Summerland, B.C. (G.E. Woolliams).

STEM GIRDLING (Rhizoctonia Solani). Several flats of plants in a greenhouse at St. Vital, Winnipeg, Man., showed severe stem girdling accompanied by retarded growth and wilting. The organism was isolated by J.E. Machacek (W.A.F. Hagborg).

INFECTIOUS CALOROSIS (virus). A trace was present on California Wonder at the Station, Summerland, B.C. (G.E. Woolliams).

MOSAIC (virus) in comparatively small amounts was observed in several localities in Lincoln Co. and at Ancaster, Ont. (J.K. Richardson). Seven plants showing mosaic (Solanum virus 2) were found in a field in Sunbury Co., N.B. (D.J. MacLeod). Mosaic affected 5% of the sweet pepper plants in a planting at Lower Canard, N.S. (J.F. Hockey).

LEAF ROLL (non-infectious) affected 7% of the plants in a field in Sunbury Co., N.B. The affected plants showed an upward rolling and increased firmness of the leaves with a dwarfing of the plant. Scions of these plants were grafted to the President potato, Bonny Best tomato and Capsicum annum. After 60 days, no evidence of a virus appeared in the grafted plants (D.J. MacLeod).

SUN SCALD (non-parasitic) caused a severe browning on the exposed side and blossom end of 2% of the fruits in a planting at Lower Canard, N.S. (J.F. Hockey).

POTATO

The Plant Protection Division, Science Service, have supplied the compilations on the extent of the seed potato industry, the acreages of the leading varieties passing inspection, the number of fields which failed to pass inspection, and the average percentage of the diseases - black leg, leaf roll, and mosaic - found in the fields. All fields entered for certification are planted with foundation or foundation A seed.

As shown in Table 4, there has been a remarkable increase in the percentage of the crop passing inspection with the adoption of the regulation that a field to be entered for certification must be planted with foundation or foundation A seed. In order to qualify for certification in these classes the tolerance for all diseases, particularly for the virus diseases, have been greatly reduced. To meet the requirements for foundation seed, the field must be planted in tuber units; for foundation A the regulation is not compulsory, but it is probably advantageous to the grower to do so in most instances.

This remarkable improvement in the percentage of crop passing inspection may not be due entirely to the improved quality of the seed being used. In 1943 aphids were relatively scarce in the principal seed production areas in eastern Canada, and in consequence the spread of virus diseases may have been below the normal expectation.

There has been no appreciable change in the bacterial ring rot situation in certified seed; Quebec still has the largest number of rejections.

Table 4: Seed Potato Certification: Number of Fields and Acres Inspected, 1944.

Province	Number of Fields		Fields Passed	Number of Acres		Acres Passed
	Entered	Passed	%	Entered	Passed	%
P.E.I.	3,785	3,609	95.3	14,507	13,885	95.6
N.S.	286	268	93.7	630	594	94.2
N.B.	1,858	1,745	93.9	10,966	10,315	94.0
Que.	938	586	62.5	1,856	959	51.6
Ont.	729	644	88.3	1,753	1,527	87.1
Man.	123	82	66.6	267	207	77.5
Sask.	79	70	88.6	91	62	68.1
Alta.	176	146	82.9	320	251	78.4
B.C.	526	417	79.3	1,243	701	64.4
TOTAL:	8,500	7,567	89.0	31,633	28,601	90.4
Previous Yearly Totals						
1943	9,562	5,520	57.7	34,947	19,148	54.8
1942	7,947	5,023	62.2	29,981	18,875	62.9
1941	9,813	6,404	65.3	37,668	24,405	64.8
1940	12,388	8,676	70.0	48,111	34,094	70.1

Acres Entered		Acres Passed	
1943	34,947	1943	19,148
1944	31,633	1944	28,601
Decrease of 3,314 or 9.5%		Increase of 9,453 or 49.4%	

COMMON SCAB (Actinomyces scabies) was more prevalent in B.C. in 1944 than in the previous year and in a few fields it was fairly severe; the increase was attributed to more favourable soil conditions due to the dry weather during the growing season (H.S. MacLeod). Smooth skinned varieties were more free from scab in Alta. than they have been in the last few years (J.W. Marritt). Scab appeared to be in general more prevalent in Sask. than in 1943; in several fields scab was so severe that grading for seed is impracticable. In one crop of Early Six Weeks grown north of Regina almost every tuber was affected by a skin scurf resembling light scab which gave a very unattractive appearance to the crop (A. Charlebois). Slight scab was encountered in most lots of tubers inspected in Man. (W.A. Cumming). Scab was about the same as usual in Ont., but many lots of Katahdin showed sufficient superficial scab to make grading unprofitable (J.W. Scannell). Scab was of minor importance in Que. and caused slight damage. A 20-80% infection occurred in a few fields along the lower St. Lawrence and all tubers were scabby in a few lots in the Montreal district (B.

Baribeau). Scab was prevalent on potatoes in limed soil or on old potato ground in N.B. (C.H. Godwin). Common scab was present in a third of the tuber lots inspected in N.S.; an average of 2% of the tubers were affected. Samples were received from several tablestock fields where the tubers were moderately checked and russetted. Actinomyces was isolated (J.F. Hockey, W.K. McCulloch). Scab was more or less prevalent in all parts of P.E.I.; in some fields it was quite severe (S.G. Peppin). In one lot of Green Mountain, where the land had received 4000 lb. of waste stone lime in 1943, the tubers were so severely scabbed that the crop was worthless (R.R. Hurst).

EARLY BLIGHT (Alternaria Solani) was present in varying amounts especially at the coast and in the southern part of the B.C. Interior, but the damage was slight (H.S. MacLeod). Infection was severe in several plantings of early varieties at Edmonton, Alta. and moderate in the plots at Olds (M.W.C.). The disease appears to have been more prevalent in the northern districts of Sask. than in previous years. It apparently caused the premature death of the vines of early varieties north of Battleford and Prince Albert (A. Charlebois). A slight infection was present on Bliss Triumph in an irrigated plot at the Scott Station (H.W. Mead). A slight infection was recorded in Man. and Northern Ont. (W.A. Cumming). Early blight caused only slight damage in Que. except in the Eastern Townships, where the yield was reduced 10% on account of the premature death of the vines (B. Baribeau). The disease was rather prevalent in late-planted fields in N.B. (C.H. Godwin). Early blight was common everywhere in N.S. The weather was generally dry and favourable for the disease, but scattered showers kept even susceptible varieties, such as Irish Cobbler, growing with the result that heavy crops were harvested. Only a few tubers affected by Alternaria rot were reported (W.K. McCulloch). A few fields showed a light to moderate infection late in the season in P.E.I. (S.G. Peppin). A scattered infection was seen in Irish Cobbler in the Laboratory bins in January 1944 (R.R. Hurst).

Table 5. Seed Potato Certification: Acreages Passed by Varieties, 1944.

Variety	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.-Alta.	B.C.	Total
Green Mountain	4,073	48	3,394	858	69	5	46	8,493
Irish Cobbler	7,155	180	602	87	141	131	3	8,299
Katahdin	1,625	196	4,860	15	1,052	7	13	7,768
Bliss Triumph		37	1,420			17		1,474
Sebago	990	70	1		55			1,116
Netted Gem					3	255	496	754
Chippewa	4		10	13	169		12	208
Warba		16	1		14	37	59	127
White Rose							83	83
Houma	32		7		4	3	1	47
Sequoia	3	40					1	44
Early Epicure						11	31	42
Other Varieties	3	5	22	2	20	53	56	161
TOTAL	13,885	592	10,317	975	1,527	519	801	28,616

Table 6. Seed Potato Certification: Fields Rejected on Field Inspection, 1944.

Province	Leaf Roll	Mosaic	Ring Rot in field	Ring Rot on farm	Adjacent Diseased Fields	Black Leg	Foreign Varieties	Misc.	Total
P.E.I.	37	43			29	6	27	34	176
N. S.	3				3		8	4	18
N. B.	20	5	31	25	14		11	7	113
Que.	27	35	148	49	36	33		20	348
Ont.	3	5	5	11	8	6	11	36	85
Man.	2		9	14	3	2		11	41
Sask.					3			6	9
Alta.	2			11	4	2	5	6	30
B. C.	38	13			23	7	3	25	109
TOTAL:	132	101	193	110	123	56	65	149	929
Rejections as a percentage of fields:									
Entered	1.5	1.2	2.3	1.3	1.4	0.7	0.8	1.8	11%
Rejected	14.2	10.8	20.8	11.8	13.2	6.0	7.0	16.2	100%

Table 7. Seed Potato Certification: Average Percentage of Disease found in Fields, 1944.

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	.04	.007	.03	.18	.09	.12	-	.13	.09
Leaf Roll	.32	.19	.40	.22	.06	-	.02	.11	.35
Mosaic	.17	.05	.10	.24	1.6	3.17	.15	.02	.29
Fields passed: (final inspection)									
Black Leg	.01	.006	.01	.03	.01	.14	-	.02	.04
Leaf Roll	.09	.08	.13	.13	.02	-	.016	.07	.20
Mosaic	.04	.02	.07	.13	.02	.04	-	.01	.15

GREY MOULD (Botrytis cinerea) caused the premature death of the leaves of plants in the Laboratory greenhouses, Fredericton, N.B., in June. The infection centred on areas in the leaf where portions of the flower adhered (J.L. Howatt).

BLACK DOT (Colletotrichum atramentarium) was found causing the death of 5% of the plants on several varieties in a planting on the lower St. Lawrence, Que.; no rot was observed at digging time (B. Baribeau).

RING ROT (Corynebacterium sepedonicum) was not found in any crop grown in B.C. in 1944. Only 6 cases have been found in B.C., the first being in 1942, and it is believed that each one has been eradicated (H.S. MacLeod).

The survey for bacterial ring rot conducted in Alta. in 1944 has shown that definite progress has been made toward control of this disease. Ring rot is still mainly confined to the irrigated areas centering on Lethbridge and Brooks, and to the market gardens of Calgary, Drumheller and Medicine Hat. These sections are now all constituted pest areas under the Agricultural Pests Act and a virtual quarantine exists in these districts. A special precautions area was established this year in the last large commercial potato growing area in Alta. centering on Edmonton. Two farms were found infected in this district.

The 1944 survey was the most satisfactory ever carried out and covered a greater area than any previous survey. In all, 1,010 farms were visited and ring rot was found on 241, affecting 1,616 acres. This was an increase of only 6 farms over the previous year although 75 more farms were visited. Thus there was a significant reduction in the rate of spread.

Marked progress has been made in reducing the intensity of ring rot infections. In 1939, when the first survey was undertaken, fields showing 25 to 35% of the plants diseased were very common. For the first 3 years there was little change in intensity, but in 1943 a considerable decrease occurred in the number of diseased plants per acre, while in 1944 the average intensity in all diseased fields was 4%, with only 45 acres showing more than a 10% infection in the field.

The reduction in the spread and intensity of bacterial ring rot in 1944 is attributed to the supplying of large quantities of disease-free seed potatoes to growers in the pest areas and to the extension and more vigorous enforcement of the quarantine regulations (J.L. Eaglesham). Bacterial ring rot was not found in any fields entered for certification in Alta. However, it was present on 2 farms on which seed potatoes were being grown (J.W. Marritt).

In late August, 15 farms were visited in the Pike Lake area, Sask., to survey for ring rot. Most of these farms had been visited in 1943 and some in 1942. Bacterial ring rot was found on 8 farms and infection varied from a trace to 5-10%, a decrease in comparison with 1943. In an area embracing Moose Jaw and Regina, the disease was found for the first time in 4 fields out of 9 inspected. Other new points were Dodsland and Carmel. The Dodsland grower had planted table stock potatoes said to have been secured in Edmonton, and at

entered for certification. Besides the Pike Lake area, casual observation in the Estevan district seemed to indicate that the disease was spreading in that district (A. Charlebois). Nine fields out of 124 entered for certification in Man. were rejected on account of ring rot and 14 others were disqualified because ring rot was present in other fields of the same farm. Bacterial ring rot was not found in northwestern Ont. in 1944 (W.A. Cumming).

In 1944, bacterial ring rot was detected by the Gram stain test in 14 out of 26 samples of potatoes from fields entered for certification in Man. Of the 14 samples, 9 were collected during field or bin inspection and 5 after these inspections were made. Of these 5, 1 was found in tubers of the 1943 crop submitted for indexing, 2 in tubers of the 1943 crop when they were cut for sets in 1944, and 2 in tubers of the 1944 crop submitted for indexing. It would seem that bacterial ring rot may escape careful field and bin inspections and not be detected until later. In 1944 a heavy attack of late blight increased the difficulty of detection during field inspection (W.A.F. Hagborg).

During a field survey of commercial plantings of table stock potatoes, at digging time in Man., bacterial ring rot was found in 13 fields out of 45 visited. The percentage of tubers visibly affected by the disease ranged from a trace to 8%. It is probable the bacterial ring rot was more abundant, but the presence of tubers rotted by Phytophthora infestans, Pythium sp. or soft rot bacteria made detection difficult. Potatoes being offered for sale in the retail trade have also been surveyed for ring rot. At the begining of each month, in November and December 1944 and January 1945, a 10-lb. lot of table-stock potatoes was purchased from each of 10 different retail grocers in Winnipeg. These tubers were examined for various defects and an attempt was made to estimate the loss from rotting. Ring rot was detected in 2 lots in November, 3 in December and 4 in January. The infection ratings for these samples were: November 1/53, 1/30; December 3/29, 4/26, 5/36; January 2/35, 2/29, 3/43, 7/31. (J.E. Machacek).

Bacterial ring rot was found in 5 fields entered for certification and the disease was present in 11 cases in other fields on the same farm. A further check on the 5 fields found infected in 1944 has revealed that they were planted with certified seed that had been inspected early in 1943. One field that came under suspicion during the summer of 1944, was visited twice after the regular inspections before ring rot was found. It would appear that a definite period must elapse between the date of planting and the appearance of symptoms (J.W. Scannell).

Inspectors of the Crops, Seeds and Weeds Branch, Ont. Dept. of Agriculture, found bacterial ring rot on 465 farms, comprising 2800 acres of table-stock potatoes according to R.E. Goodin. In every case, samples were submitted to the St. Catharines or Ottawa Laboratories for examination. At first glance, there would appear to have been an alarming increase in 1944 over the previous year, when bacterial ring rot was found on 160 farms in 1400 acres of table-stock. However, the great increase in the number of cases recorded was due to the survey in 1944 being much more extensive than in 1943. The encouraging feature was that in 1944 ring rot was found on only 16 farms of the 160 where the disease was reported in the previous survey. Thus the value of the eradication campaign in this province has been clearly demonstrated in its first year. (L.T. Richardson).

There was very little change in the bacterial ring rot situation in Que. The weather conditions in the early part of the season were favourable for symptom expression, particularly in the lower St. Lawrence district. In 1944, the average intensity of infection in infected commercial fields of table stock was more than 10%, while in infected fields entered for certification it was below 0.6%. The disease was found in 148 fields entered for certification and in 49 other cases it was present on the same farm. Bacterial ring rot was found in 4.7% of the fields planted by hand in tuber units as against 15.7% in fields where a planter was used. The latter seed, however, is hardly as good quality (B. Baribeau). Fields of table stock were encountered in Kamouraska Co., where intensity of infection was 10 to 30% and in one field 40% of the plants were affected (A. Payette).

Bacterial ring rot was found in N.B. in 31 fields entered for certification and on 25 farms where fields likewise entered were located. The improvement over the previous year was attributed to the extra precautions growers took to insure that the seed they planted was sound, an interest inspired by the unusually favourable price anticipated for seed potatoes. In the spring of 1944, the price was $5.50 per barrel (C.H. Godwin).

Bacterial ring rot was not found this year in potatoes grown in N.S. It was found, however, in imported table stock in Halifax. Warnings were sent out against the use of table stock for seed purposes (W.K. McCulloch).

Bacterial ring rot was found by table stock and seed inspectors in 70 lots of table stock and 3 in certified seed in P.E.I.; most of the cases were located in the Freetown area, Prince Co., with a slight outbreak near Charlottetown. In certified seed, one was in a 1943 crop of Irish Cobbler, the other 2 were found in tubers of Katahdin. Samples were checked by the Gram stain method. (R.R. Hurst). A useful mimeographed account of the symposium on bacterial ring rot of potatoes held at the annual meeting of the Canadian Phytopathological Society in Toronto, June 26-28, 1944, has been issued by the Society.

BLACK LEG (Erwinia phytophthora) was more prevalent in B.C. in 1944 than in the previous year. Although it was found in 69 fields out of 526 inspected only one field was rejected (H.S. MacLeod). Black leg infected 60% of the plants in a planting of Warba on chocolate loam soil near the sea at Sidney, and caused severe damage; Burbank on the same soil and Warba on clay soil in the same field were not affected (W. Jones). Black leg was present in most fields inspected in the Brooks and Duchess districts, Alta., the highest infection being 11%. In the central and northern districts rainfall was excessive in June and low areas in potato fields were flooded; black leg tended to develop on the margins of such areas (J.W. Marritt). Infection was general around Edmonton, damage ranging from a trace to 20% (G.B. Sanford).

Black leg caused the least damage in years in Sask. The disease was present in less than 4% of the fields entered for certification and caused no rejections. Table stock was much less severely infected in areas where it is usually common (A. Charlebois).

Black leg was found in 11 out of 124 fields and caused the rejection of one in Man. The corresponding figures in northwestern Ont. were 18 out of 67 and one rejection (1.25% was present on 2nd inspection). A striking example of the spread of black leg was observed at Winkler, Man. One half of a 4½ acre field was planted with freshly-cut seed; a heavy rain prevented the immediate planting of the other half and the seed which had been cut already was stored in bags in an open shed for one week and then planted. On July 7, 5% of the plants were affected by black leg in the half of the field in which planting was delayed and 0.2% in the part which was planted immediately. The field was heavily rogued, yet on Aug. 11, the infection was now 10% in the late-planted section and 0.4% in the other. It may be noted: firstly, black leg spread rapidly in seed cut and left in the open for a week, and secondly, the spread was along the rows rather than sidewise into the adjacent relatively clean half, probably due to water lying between the rows following heavy rains (W.A. Cumming). Infection was moderate in a field at St. Adolphe and slight in St. James, Winnipeg (J.E. Machacek).

Black leg was not at all common in Ont. (J.E. Scannell). The disease was again prevalent in the Chicoutimi and Lake St. John districts, Que. Of the 33 fields rejected for black leg in Que., 30 were in those districts. In other districts of the province the disease was barely noticeable (B. Baribeau). Black leg was not found in many fields in N.B. (C.H. Godwin). The disease was little in evidence in N.S. in 1944; it was found in 7 fields entered for certification (W.K. McCulloch). Black leg was less prevalent than usual in P.E.I.; 6 fields were rejected (S.G. Peppin). The average infection in 25 fields of Green Mountain table stock was 0.5% and in 15 of Irish Cobbler it was a trace (R.R. Hurst).

WILT (Fusarium oxysporum) was found in 101 fields entered for certification in B.C. and caused the rejection of 4, an increase in prevalence and severity over 1943. The soil of the affected fields was quite dry, and temperatures were high during a considerable part of the growing season (H.S. MacLeod). Wilt was present in 20 fields of 124 inspected in Man. and one was rejected; in northwestern Ont., a slight amount of wilt was present in 2 out of 67 fields (W.A. Cumming). A severe infection was observed at Reston, Man. (J.E. Machacek). Wilt was not common in Ont. (J.W. Scannell). A few samples of tubers received in connection with the bacterial ring rot survey were found affected with wilt. Also a number of plants said to be affected by purple top from the Hillsburgh area yielded pure cultures of Fusarium spp. (J.K. Richardson). Wilt was observed in 4 fields of Green Mountain on the lower St. Lawrence, Que. Infection was slight, but many affected plants produced tubers affected with soft rot (B. Baribeau). Typical wilt symptoms were present in plants in an ill-drained spot in a field of Green Mountain at Ste. Anne de la Pocatiere; 2 species of Fusarium were isolated (A. Payette). A few fields were affected by wilt in Victoria, Co., N.B. (C.H. Godwin). About 5% of the plants were severely wilted in a field of Green Mountain in P.E.I. and many other plants were definitely affected but not wilted on Aug. 1 (R.R. Hurst).

WILT (Fusarium and Verticillium) was present in only 3 fields entered for certification in Alta. It was also much less in evidence in fields of table stock, particularly in southern Alta. than in 1942 and 1943 (J.W. Marritt). Wilt was present in 20% of the fields inspected and caused the rejection of 2 in Sask. Many garden plots were severely affected in southern and central Sask. (A. Charlebois), including the Saskatoon area (R.J. Ledingham).

STEM-END ROT (Fusarium Solani var. eumartii). A few scattered specimens were found in Que. (B. Baribeau).

SET ROT (Fusarium spp.) was reported in 2 fields in Temiscouata Co., Que. (B. Baribeau).

TUBER ROT (Fusarium spp.) a soft, very watery rot, which rapidly involved the whole tuber, was found slightly affecting tubers both in the field and in storage at Ste. Anne de la Pocatiere, Que. (A. Payette). Tuber rot was quite prevalent in shippers' warehouses in N.B. in the spring of 1944 (C.H. Godwin). Affected tubers were received from many parts of P.E.I. The disease caused severe losses in the winter of 1943-44, infection on Jan. 1, varying from a trace to half the crop.

PIMPLES (Oospora pustulans). A single affected tuber of Irish Cobbler was seen on the market, Charlottetown, P.E.I. (R.R. Hurst).

PSYLLID YELLOWS (Paratrioza cockerelli) was observed in a limited area in the Drumheller district, Alta. (G.F. Manson).

RHIZOCTONIA (Pellicularia filamentosa (Rhizoctonia Solani). Infection was slight to moderate on plants in 1944 in B.C., but it was less severe than usual; tubers were also less affected, but some lots will have to be heavily culled before certification (H.S. MacLeod). Moisture was optimum and killing frost were late in Alta. Accordingly most of the crop was immature when dug and tubers were unusually free from sclerotia (J.W. Marritt). Injury by rhizoctonia was severe in 9% of the fields inspected and moderate in 14% and slight in most of the others in Sask. (A. Charlebois). Rhizoctonia caused very little damage to the plants in Man. and northwestern Ont.; however, many lots in Man. showed a slight development of sclerotia on the tubers (W.A. Cumming). An affected plant was received from Berwick, Ont. (L.T. Richardson).

Only slightly affected plants were seen during field inspection in Que.; on bin inspection the percentage of affected tubers was negligible except for a few badly affected lots on the table stock markets in Quebec and Three Rivers (B. Baribeau). Rhizoctonia caused some misses in fields of Irish Cobbler and Bliss Triumph in N.B.; tuber infection was slight in the bins inspected up to Oct. 25 (C.H. Godwin). Rhizoctonia was common in every potato field in N.S., but the infection for the most part was slight. In fields planted in tuber units, there were many striking instances of finding all the plants in a unit missing and when the sets were uncovered, they bore the blackened remains of the sprouts; in most cases sclerotia could still be seen on the sets. The average infection on the tubers was about 3.5% (W.K. McCulloch). Scarcely any rhizoctonia was noted in the field in P.E.I., but a light to moderate development of sclerotia was found on some tubers at bin inspection (S.G. Peppin). In 3 fields, one each of Irish Cobbler, Green Mountain and Katahdin in July, 19% of the plants were injured or missing due to rhizoctonia. In August, the Pellicularia stage was observed occasionally on the same varieties (R.R. Hurst).

LATE BLIGHT (Phytophthora infestans) was not as prevalent nor as severe as in many previous years in B.C., although it was present in a considerable number of fields, especially at or near the coast. Weather conditions were unfavourable for its development and spread and it caused no serious damage. Good control was obtained by growers who sprayed sufficiently early and frequently. Most fields were harvested while the weather was fine and warm; loss from late blight rot was very slight (H.S. MacLeod). A slight infection was found again in fields in the Edmonton district, Alta., when they received their second inspection (J.W. Marritt). Late blight was found in several plantings at Edmonton in late August, but the disease made little progress during the dry period which followed. It was not found south of Edmonton, but an affected specimen was sent in from Star, northeast of Vegreville. No tuber rot was found at harvest time (M.W.C.).

The epidemic of late blight in 1944 was the heaviest ever recorded in Man. The present year is also the fourth one in succession that the disease has been epidemic. The weather during the latter part of the season was ideal for its spread. The losses in the Red River Valley, where most of the commercial crop is grown, were heavy; many growers left more than half of their crop on the ground at digging time. Warba, on account of its earliness, showed little tuber damage. Losses were also severe along the Assiniboine Valley both at Portage la Prairie and Brandon. Damage from excess water, along with late blight, caused severe losses in the Carman district. Nearly all areas in the province suffered some damage from late blight. In general, growers have not as yet realized the importance of spraying for this disease. Late blight was also quite prevalent in the 3 districts of northwestern Ont. (W.A. Cumming).

In Man. late blight was found first on July 15 on potatoes in two widely separated Victory gardens in Winnipeg. The disease was discovered shortly afterwards in commercial fields near Winnipeg, and before the end of August the fungus had apparently spread throughout the province.

The latter part of August was relatively dry and cool and there were abundant dews. The fungus apparently remained active although the potato foliage was not severely injured. Later when rains came in unusual abundance, in almost every locality, potato vines were severely attacked and at the same time sporangia from diseased foliage were washed down to the tubers. Rot in the tubers was abundant particularly where cracks in the soil above developing tubers had been an avenue whereby infection from the foliage easily spread to the tubers. In some areas of Man. the loss from tuber rot was 100% while in other areas it was less severe. No field visited by the middle of September was free from the disease. From the evidence at hand, it appears that probably 50% or more of all potatoes grown in Man. will have rotted before next spring. A severe infection was seen in several plantings at Kenora, Ont., on Aug. 31 (J.E. Machacek).

As the summer of 1944 was very dry in Ont., late blight did not appear to any extent until early September. Some growers sprayed or dusted until about Sept. 1, and then stopped with the result that their crops became infected. Growers who continued to spray or dust had fairly good control but the potatoes were very slow in maturing. Growers who did very little spraying or dusting during the season obtained crops that ripened up before September, with little or no blight present, although the yields were low (J.W. Scannell). About Swastika,

"quite a large number of people have taken to raising their own potatoes, but both last year and this, this disease has taken from 35 to 50% of the crop" according to Wm. E. Armstrong, Public School Principal (H.N.R.). For the first time in the past 25 years late blight caused unusually severe damage in the lower St. Lawrence district, Que. The disease was first observed in L'Islet Co. (60 miles east of Quebec City) on Aug. 9, but it made little or no visible progress during the rest of the month. On the other hand, from Sept. 9 to 16 the disease spread very rapidly destroying all the foliage of fields for 400 miles. Then followed a week of rain, which washed the spores down to the tubers; in many fields up to 30% of the tubers were affected, and the average was 15-20%. In the Gaspe Peninsula late blight appeared Aug. 22 and was quite severe on the foliage and tubers. Sebago was badly affected when it was grown in close proximity to Dakota Red, Early Rose, McIntyre Blue and Western Red in Gaspe Co. Upon digging, the tubers of Sebago were more severely affected than those of the other coloured varieties. Infection was also observed on the foliage and tubers of President. In other districts of Que. late blight was present but tuber infection was very slight (B. Baribeau).

Late blight became quite serious in N.B. during September after a dry summer. In unsprayed fields tuber rot was severe; in some cases 22% of the tubers were affected (C.H. Godwin).

Storage losses as high as 50% were reported in the fall of 1944 in many potato stocks in N.B. While many factors were responsible for this heavy loss undoubtedly the most important was late blight rot. That late blight should be so destructive this year was puzzling to many growers and dealers in view of the fact that the season appeared to be unfavourable for blight development. However, there is no mystery in the situation when all factors are properly considered.

To begin with, last season's potato crop suffered severely from late blight rot and in consequence, more blight-infected sets were planted this spring than usual. Given favourable weather conditions, a severe blight epidemic was inevitable. Rainy weather during the last week in July was conducive to infection and in a few coastal localities blight began to assume alarming proportions as early as July 23. The hot, dry weather in August drastically suppressed the spread of the disease but the blight was maintained during this period to a slight extent over wide areas on the stems of infected plants.

In consequence of the hot dry summer, spraying was curtailed or improperly timed. Early varieties such as Irish Cobbler and Bliss Triumph matured rapidly and by the middle of September, a considerable acreage of these varieties was ready for harvest, or had been harvested. At this time little blight was visible on the foliage, hence early harvested crops showed but slight infection at digging time or later in storage.

With the advent of cooler weather in September and an abundant rainfall of nearly 5 inches, moisture conditions became more favourable for blight development, although temperature conditions were not optimal. At this time large acreages of potato vines were still alive although growth had ceased. Two light frosts occurred in late September but injury was confined to the

upper part of most vines. After these frost sporulation of the blight fungus became abundant on the lower leaves of the potato plants. This infection on the whole was overlooked by the grower who thought that the dying foliage was suffering from frosts exposure.

The abundant rainfall in October and favourable temperature conditions during the early part of the month enhanced sporulation on those leaves of the plants uninjured by frost. By this time most of the fields were water-soaked and environmental conditions were most favourable for the survival of blight spores. On the whole, in few fields were the vines killed artificially, and digging began on an extensive scale when viable spores were still abundant on the foliage, or on, or in the soil. As a consequence many potatoes were infected before or inoculated at digging time. Many rotten or freshly inoculated tubers were admitted to storage. Owing to the wet condition of the land, tubers were commonly stored with a great amount of adhering soil. The soil impeded drying and air circulation with the result that breakdown was extensive and rapid in storage (J.L. Howatt).

Late blight was not general in N.S. and was first reported on September 8. Yields were reduced but slightly and the average tuber rot was 0.5%. Well sprayed crops gave heavy yields of sound tubers (W.K. McCulloch). Late blight was very prevalent on Green Mountain in the western part of P.E.I., lighter in the central part, but more or less prevalent on Katahdin in the eastern section. Rot was severe in many cases (S.G. Peppin). In 10 fields of Green Mountain table stock in Queens Co., 10% of the seed pieces were decayed due to late blight rot in the sets. Late blight was heavy in several cull piles examined in late June or July. Late blight caused slight to severe damage to the vines in September, affecting the leading varieties including Sebago. A heavy outbreak of tuber rot occurred in storage in November due mainly to digging the crop while viable spores are still present. There was almost no rot where the vines were killed off (R.R. Hurst).

LEAK (Pythium ultimum). Some affected tubers were graded out at Vancouver during early fall from shipments from the lower mainland, B.C. (W. Jones). A few tubers of Netted Gem and Katadhin grown at the Summerland Station were affected (G.E. Woolliams). A tuber rot (Pythium sp.) developed in field and storage at Ste. Anne de la Pocatiere, Que., causing considerable loss in certain lots of tubers from the experimental plots. The rot was favoured by excessive humidity and possibly high temperature (C. Perrault).

SCLEROTINIA ROT (S. sclerotiorum) affected a few plants in 2 fields at Cloverdale, B.C. (W. Jones).

SILVER SCURF (Spondylocladium atrovirens) was present on a tuber received from Lethbridge, Alta. (H.N. Racicot). At bin inspection silver scurf was present in Que. but no severe cases were observed (B. Baribeau). Silver scurf was noted in N.B. on tubers from fields planted to potatoes 2 years in succession (C.H. Godwin). Silver scurf was observed on the 1943 crop in storage in N.S. Infection was slight on Earlaine, Irish Cobbler and Katahdin, but it was heavier on Warba, amounting to 30% in one bin (W.K. McCulloch). A light to moderate infection was already present in some sections in P.E.I. in the early part of the shipping season; usually it is not seen until later (S.G. Peppin).

POWDERY SCAB (Spongospora tuberosa) was found on tubers from several fields in the Fraser Valley, B.C., particularly in the Cloverdale district (H.S. MacLeod). Infection exceeded 50% in a few cases in Temiscouata Co., Que., and it was also occasionally severe in Kamouraska and L'Islet Co. and the Montreal district. The disease has not been reported from other districts (B. Baribeau). Powdery scab was not reported during the regular inspections in N.B. (C.H. Godwin), nor in N.S., and so far only 3 infected tubers have been seen (W.K. McCulloch). The disease was found in one lot of Green Mountain on the market, Charlottetown, P.E.I. (R.R. Hurst).

WILT (Verticillium albo-atrum). Infection was observed in several fields in Alta. and was apparently general (G.B. Sanford). One lot was rejected in P.E.I. on account of the field containing 10% of wilted plants; small amounts were also recorded in several other fields (S.G. Peppin). About 65% of the plants were infected in one field of Irish Cobbler table stock; it was also noted in 20 other fields (R.R. Hurst).

CALICO (virus). Several plants from a field of Green Mountain in P.E.I. were affected by a virus disease identified as calico by D.J. MacLeod (R.R. Hurst).

LEAF ROLL (virus) was found in 250 fields inspected and was the cause of rejection of 38 in B.C. Several of the larger fields were rejected due to current season infection; the fields were located in the Fraser Valley where the aphid population was much larger than in any previous year (H.S. MacLeod). Leaf roll was the cause of rejection of 15% of the fields inspected in Alta. The percentage of affected plants was high in garden plots, victory gardens and markets about Edmonton, Calgary, Medicine Hat and Red Deer; elsewhere little leaf roll occurred (J.W. Marritt). Leaf roll was fairly common in city gardens in Sask., with a high percentage of affected plants in some plantings (R.J. Ledingham). About 10% of the fields inspected were rejected for leaf roll (A. Charlebois). Only 2 fields were rejected for leaf roll in Man. A small percentage of leaf roll plants, mostly in Chippewa, was noted in northwestern Ont. (W.A. Cumming). Leaf roll was not prevalent in Ont. (J.W. Scannell). In comparison with previous years only 2.8% of the fields inspected in Que. were rejected on account of leaf roll. The fact that little marginal seed from outside the province was planted may have been a factor (B. Baribeau).

Only 40 fields were rejected for leaf roll in N.B. in 1944; the average infection in 858 inspected was 0.4% (C.H. Godwin). Leaf roll was common in table stock fields of Green Mountain and Irish Cobbler in York, Sunbury, Queens, Westmorland and Carleton Co.; infection ranged from 3 to 17% in the fields examined. Only a trace was present in the seedlings at the Alma Substation. Two of these seedlings, when tested, showed the type strain of Solanum virus 14. Net necrosis was observed unusually early this year in N.B. Certain Green Mountain potatoes exposed to leaf roll infected stock showed severe net necrosis one week after they were harvested. The symptoms ranged from a slight necrosis of the phloem at the stem end to almost complete involvement of the vascular system of the tuber. Katahdin, Chippewa and Houma grown at the same location showed no net necrosis (D.J. MacLeod). Only 3 fields, the lowest percentage since 1937, were rejected for leaf roll

in N.S. Two reasons may be given: the unfavourable conditions for aphids in 1943 and the general use of better seed. More table stock growers than usual bought certified seed last spring. Consequently leaf roll was not very noticeable anywhere (W.K. McCulloch). Leaf roll was present in all varieties in P.E.I., but the percentage of affected plants was much less than in the previous 4 years. Only 37 fields were rejected in 1944 compared with 1,174 in 1943 (S.G. Peppin). Although leaf roll was less prevalent in fields entered for certification, average percentage of leaf roll was 19% in 25 fields of Green Mountain table stock and 12% in 12 fields of Irish Cobbler. Net necrosis was observed in several samples brought in for diagnosis. All samples yielded plants affected by leaf roll in greenhouse trials (R.R. Hurst).

MILD MOSAIC (Solanum virus 3) was common in table stock fields of Green Mountain in York, Sunbury, Queens, Westmorland and Carleton Co., N.B. During a hot dry period (temperature 90-96° F.) in August, mild mosaic symptoms were largely masked. In early August a mild type of mosaic appeared in Katahdin and Green Mountain, which could be detected for 2 weeks, after which it gradually disappeared. This mosaic was due to Solanum virus 1 (L and N strains) D.J. MacLeod).

MOSAIC (virus) was found in 179 fields inspected and was the cause of rejection of 13 in B.C. (H.S. MacLeod). The disease was present in only 9% of the fields entered for certification in Alta. Its occurrence in table stock was similar to that of leaf roll (q.v.) J.W. Marritt). Mosaic was seen in 28% of the fields entered for certification in Sask. It is the most common disease in Sask. (A. Charlebois). Mosaic was common in city gardens in Sask. (R.J. Ledingham). Three small plots were rejected in Man. because they were adjacent to a field of Bliss Triumph, in which all plants were affected by mosaic. In Northwestern Ont., 2 fields of Green Mountain from the same seed showed 100% infection (W.A. Cumming). Little mosaic was present in fields entered for certification in Ont. (J.W. Scannell).

Only 3.7% of the fields entered for certification were rejected for mosaic in 1944 in comparison with 13.9% in 1943 (B. Baribeau). In discussing the low incidence of virus diseases in fields entered for certification Mr. Baribeau drew attention to the population studies made from the potato aphid survey in Que. by Mr. R.P. Gorham, Dominion Entomological Laboratory, Fredericton, N.B. I am not at liberty to quote these figures, but it would appear that fluctuations in percentage of fields rejected for mosaic is directly correlated with the population of Macrosiphum solanifolii in the previous year; similarly the percentage of fields rejected for leaf roll is directly correlated with the population of Myzus persicae. The remarkable falling off in the percentage of rejections for mosaic and leaf roll in 1944 is undoubtedly in part the result of the greater degree of freedom from virus disease required in the production of foundation and foundation A seed, which must be used for a field to be eligible for certification. However, the low percentage of rejections realized in 1944 was greatly favoured by the low population of aphids and it is most unlikely that the percentage of rejections will continue at this low level. While no immediate increase in leaf roll is anticipated, it would appear that rejections for mosaic will be on the order of 5-10% in 1945 (I.L.C.). Mosaic caused the rejection of 5 fields in N.B.; this is the lowest number of rejections on record (C.H. Godwin). The percentage of mosaic was the lowest on record in the fields

inspected in N.S. and none were rejected. The principal factors responsible have been discussed under leaf roll. Moreover, nearly all the larger growers plant their foundation seed plots with greenhouse indexed tubers (W.K. McCulloch). Only 43 fields were rejected in P.E.I. in 1944 compared with 378 in 1943. Very little mosaic was found mostly in Green Mountain, although a well-defined mosaic occurred more frequently in Katahdin than previously (S.G. Peppin). In Green Mountain table stock average percentage of affected plants was 41%, with one field showing 72%; the average infection in 15 fields of Irish Cobbler was 16%. Mosaic was found in some fields of eye-indexed and tuber-unit material in Kings Co., infection varying from a trace to 100%; it was plain that the virus was carried without symptoms during certain periods and yet was clearly evident at others. The damage was nil (R.R. Hurst).

PURPLE TOP (virus). Symptoms were more prevalent in tuber units of Katahdin than in those of Chippewa or Vick's Extra Early at Olds, Alta. (G.B. Sanford). The disease was widely distributed in both table stock and potatoes being grown for seed in Alta. Symptoms began to develop in early August and the percentage of affected plants increased during the month, but not during September. Soft tubers were found under most of the affected plants late in the season. Purple top was recorded in 31% of the fields inspected (J.W. Marritt). Purple top was observed in 26% of the fields examined in Sask. In a field of Warba, 26% of the plants were affected. In other affected fields particularly of the early varieties, up to 2% of the plants showed symptoms (A. Charlebois). Purple top was first seen in a field of foundation stock on July 29 at Saskatoon and according to the grower had been present for a week. About 5% of the plants were affected. Dr. A.P. Arnason, Dom. Entomological Laboratory, Saskatoon, reported an unusually heavy population of leaf hoppers. Purple top was present in the Pike Lake area, near Saskatoon, and affected plants were also seen in the Moose Jaw and Regina districts (R.J. Ledingham).

Purple top was much more prevalent in Man. in 1944 than in any previous year, being observed in 82 fields out of 124 inspected; usually not over 1-2% of the plants were affected, but in one at Findlay, over 50% of the plants showed symptoms. This field was at least a mile from any other potatoes, but with hay on all sides. It is thought that the leaf hoppers moved to the potatoes when the meadow was cut for hay. In northwestern Ont., 13 fields showed over 15% purple top and were rejected. In a small plot of Sebago at Oxdrift, Ont., all plants were affected (W.A. Cumming). Purple top was more prevalent in Ont. in 1944 than in the previous year when it was first observed (P.D.S. 23:67). There were few fields in which an occasional affected plant could not be found and in some fields infection exceeded 1%. Sebago appears to be most susceptible, followed by Katahdin and Chippewa and then by the older varieties, Dooley, Green Mountain and Irish Cobbler. In all cases, one or more spongy tubers were present in the affected hill (J.W. Scannell). Purple top was observed in a field of President table stock in Kamouraska Co., Que., and in Sebago in Gaspe Co. The disease seemed worse on low land or damp parts of the field, infections varying from a trace to 1% (B. Baribeau).

In a field of Katahdin in Carleton Co., N.B., 3% of the plants showed symptoms of bunch top (purple top). A trace showed wilt symptoms.

Bunch top was common in seedlings at the Alma Substation. In most cases the plants showed a rolling and dwarfing together with a purpling and yellowing of the foliage. A few plants showed severe rolling and distortion without loss of normal colour of their foliage. Tubers from seedlings that showed severe bunch top symptoms in 1943 at Alma produced plants with the typical symptoms of the disease. The virus from four of these seedlings and from a Katahdin source was transmitted to Lycopersicum esculentum, Datura Stramonium and Nicotiana rustica, in which it produced a vein clearing and a severe distortion of the foliage. The virus obtained from these sources does not correspond to the type strain of Collistephus virus 1 (D.J. MacLeod). Purple top is believed to be responsible for some of the misses in fields of Katahdin. The sets, in some instances, produced bunches of small tubers at the eyes. Purpling of the top observed in Irish Cobbler and Bliss Triumph fields was probably due, however, to extreme heat (C.H. Godwin). Purple top was more in evidence than usual in N.S. It was common in Katahdin, Sebago and Sequoia, from 0.1 to 3% being rogued from some fields (W.K. McCulloch). Purple top appeared to be widespread in P.E.I. in late July, but no serious damage was recorded (R.R. Hurst).

SPINDLE TUBER (virus) was present in very small amounts in both seed or table stock in Alta., although it appeared to be increasing in table stock fields in southern Alta. (J.W. Marritt). A few affected plants were noted in 3% of all fields examined in Sask., and suspected tubers were occasionally seen during bin or shipping inspections (A. Charlebois). Spindle tuber was recorded several times (R.J. Ledingham). One field was rejected in Man. on account of spindle tuber (W.A. Cumming). Spindle tuber was observed in many fields in Que., but the number of diseased plants was low. A high percentage of affected tubers was found in Nicolet Co. on bin inspection or at digging from fields planted on dry soil (B. Baribeau). Spindle tuber was not reported in the field in N.S. and very few off-shape tubers were seen during grading (W.K. McCulloch). The disease was seen in P.E.I. in some 25 fields, mostly of Katahdin and Sebago (S.G. Peppin). Average percentage of affected tubers was 1% in 25 fields of Green Mountain table stock and 0.5% in 15 of Irish Cobbler (R.R. Hurst).

WITCHES' BROOM (virus) was found in 65 fields inspected in B.C. in 1944, but the percentage of affected plants was very small (H.S. MacLeod). A small amount of the disease was present in one field inspected in the Lacombe district, Alta. (J.W. Marritt). Two affected plants were observed in one table stock field in Nicolet Co., Que. (B. Baribeau). One plant affected by witches' broom was present in imported seed from Nebraska in the tuber-index greenhouse, at the Fredericton Station, N.B. (C.H. Godwin). The virus was transmitted to Green Mountain, Lycopersicum esculentum and Nicotiana Tabacum (Samsun). Typical symptoms were produced on these hosts. A plant from Ont. sent by H.N. Racicot also showed the disease. In both cases the virus was identified as Solanum virus 15. (D.J. MacLeod).

YELLOW DWARF (virus). A single affected plant was seen in a ½ acre garden at Alliston, Ont. (H.N. Racicot). Yellow dwarf was found affecting tubers in 2 different lots of Green Mountain grown in the Division plots, Ottawa (L.T. Richardson).

BLACK HEART (non-parasitic) was affecting a few tubers in a shipment of Green Mountain at Charlottetown, P.E.I. in March, 1944. (R.R. Hurst).

ENLARGED LENTICILS (improper storage) affected about 15% of the tubers in a lot of Green Mountain in storage in Oct. 1944. (R.R. Hurst).

FROST. A patchy but widespread frost occurred on Aug. 23 in Sask.; the damage varied (A. Charlebois). Frost caused little damage in Que. in 1944 compared with the previous year; a loss of 10% of the crop was unusual (B. Baribeau). Frost caused considerable loss in N.B. to the 1943 crop. Extreme cooling of the tubers at harvest and in storage resulted in a condition similar to black heart (C.H. Godwin). About 10% of the tubers were severely injured in a lot of Green Mountain due to the tubers having been previously in contact with lumps of frozen earth (R.R. Hurst).

GIANT HILL was not as prevalent nor as severe in B.C. in 1944 as in some previous years; no field was rejected (H.S. MacLeod). Giant hill was observed in table stock in many potato-growing districts in Que. In tuber-unit plots many units showing giant hill were rogued and the tubers destroyed. The number of giant hills observed seemed to be increasing, especially in Green Mountain (B. Baribeau). Giant hill was very conspicuous in Green Mountain in N.S. at the time of 2nd inspection, particularly in fields planted in tuber units. One field with 4% giant hill was rejected (W.K. McCulloch). An occasional affected hill was seen in Green Mountain table stock in P.E.I. (R.R. Hurst).

HEAT INJURY. During a hot dry spell in August, when the temperature reached 96° F., a number of seedlings, and the varieties Green Mountain, Katahdin, Irish Cobbler and Bliss Triumph, showed at the Station, Fredericton, N.B., a severe rolling and wilting, from which they slowly recovered in the next two weeks. Houma and 2 seedlings originating in Maine grown near these potatoes, showed no evidence of heat injury. The injury was also prevalent in Green Mountain, Irish Cobbler and Katahdin in York, Carleton and Sunbury Co. Aug. 11-18 (D.J. MacLeod).

HOLLOW HEART (non-parasitic) affected 2% of the tubers in a lot of Irish Cobbler table stock in Kings Co., P.E.I. (R.R. Hurst). Hollow heart was present in some lots in which large-size tubers were produced in N.B.; they were present where a large amount of fertilizer had been applied or growing conditions were exceptionally good (C.H. Godwin).

INTERNAL DISCOLORATION. The most prevalent discoloration in potato stocks in Alta. occurred as a yellow ring mostly confined to the stem end. It may be associated with purple top (q.v.) (J.W. Marritt).

LIGHTNING INJURY was observed in 2 fields, one in Brant Co. and the other in Simcoe Co., Ont. The affected area did not exceed 2 rods square in each field (J.W. Scannell). Lightning destroyed most of the plants in an oval area of about 100 sq. ft. in a field of foundation Green Mountain in N.B. Some plants were completely destroyed while others appeared burned on one side only. Many tubers bore irregular, surface depressions and a severe necrosis of parts of the interior. Soft rot rapidly completed their destruction. In several cases injury was more severe at the eye end of the tuber. Some tubers showed no injury, but these usually produced weak plants when grown later (D.J. MacLeod). Lightning injury was severe in a small area in a field of Irish Cobbler in P.E.I. (R.R. Hurst).

LOW TEMPERATURE INJURY. Tubers all internally discoloured light to dark grey due to low temperature injury but not from actual freezing, were received April 2, 1945, from South River, Ont. (H.N. Racicot). Two cases of low temperature injury in N.B. were brought to the attention of the laboratory. The tubers showed typical frost necrosis and often the eyes were dead. Injured tubers were planted in the greenhouse and field. The plants were generally weak and matured late. 90% of the Green Mountain plants showed the "maple leaf" effect, a condition where the leaflets are fused giving the leaf a maple leaf shape. Some plants outgrew the trouble. This distortion of the leaf is caused apparently by some injury to the eye, which prevents the leaflets from developing normally. Some leaves were severely ruffled. Only a trace of maple leaf appeared in the plants from frosted Katahdin tubers (D.J. MacLeod).

Temperatures of 28° and 25° F. on Oct. 30 and 31 respectively, caused considerable low temperature injury to undug potatoes near the surface of the ground in P.E.I. Severe injury occurred in the few instances where the crop was dug and left on the ground overnight, Varying amounts of injury were observed in transit shipments of leading varieties causing damage to a trace to 20% of the tubers in January, 1944. In one lot of Green Mountain in storage in February, 1944, the tubers had turned sweet and were only valuable as seed. This was due to cold seeping through the ceiling of the storage bin (R.R. Hurst).

MAGNESIUM DEFICIENCY was common, although slight to moderate, in table stock fields in York, Sunbury, Queens and Westmorland Co., N.B. It was present chiefly in fields to which no fertilizer was applied or where magnesium was not included as an amendment to the fertilizer used (D.J. MacLeod). Magnesium deficiency is a serious disorder in P.E.I. Spraying with Bordeaux containing magnesium sulphate saved a large number of fields. Fertilizer fortified with magnesium gave perfect correction, but losses reached serious proportions in all parts of P.E.I. in many fields, to which magnesium had not been applied (R.R. Hurst).

NET NECROSIS was found in several crops inspected in 1944, but in most instances the affected tubers were only slightly affected and the number was small. A few crops have been rejected so far. Where the trouble varies considerably in different parts of the same crop, it is believed it is due to heat or drought rather than caused by a parasite (H.S. MacLeod). Net necrosis was not found in Alta. except in centres where there was a high percentage of leaf roll (J.W. Marritt). Very little net necrosis was observed in Que. in 1944, about 4% of the tubers showing necrosis or internal discoloration. In trials in the winter of 1943-44, 16,270 tubers were judged healthy and 3,497 were affected to different degrees with net necrosis. All these tubers were planted; in the first crop 4.9% of leaf roll plants were observed and in the second 30.8% (B. Baribeau). Net necrosis was less severe in N.B. than in the previous 5 years. A few isolated lots, however, were infected to a considerable extent (C.H. Godwin).

POTASH DEFICIENCY was observed in 2 fields in Queens Co., P.E.I. (R.R. Hurst).

PURPLE DWARF affected 9% of the fields entered for certification in Alta.; the average infection was less than 1%. A high percentage of plants were affected in 2 fields of table stock in central Alta. (J.W. Marritt). From 1 to 2% of the plants of Katahdin were affected in victory gardens at Lacombe and Innisfall (G.B. Sanford). Purple dwarf was found in 14% of the fields inspected in Sask.; infection seldom exceeded 0.5% (A. Charlebois).

SPINDLING SPROUT was observed in N.B. in a number of tubers from Katahdin and Sebago plants, which showed severe bunch top in 1943. Three tubers produced plants which developed bunch top symptoms; 17 produced normal plants. Spindling sprout has been observed in tubers from plants affected with leaf rolling, bunch top and witches' broom symptoms (D.J. MacLeod). A lot of tubers of Irish Cobbler brought in showing spindling sprout in P.E.I. produced leaf roll plants in the greenhouse (R.R. Hurst).

SPRAIN (cause undetermined) was found in a lot of Irish Cobbler table stock grown in Victoria Co., N.B.; 76 tubers so affected were grown in the greenhouse and all produced normal plants. Three of these plants were critically analyzed; only Solanum virus 1 (G strain) and Solanum virus 4 were found in the leaves, stems and tubers examined. A condition resembling sprain was produced in Irish Cobbler when scions from Green Mountain bearing Solanum virus 3 were grafted on the former. This latter virus could not be recovered from the affected Irish Cobbler (D.J. MacLeod). Every tuber of a lot of Irish Cobbler brought to the Laboratory in P.E.I. was affected by sprain; all the affected tubers produced healthy plants (R.R. Hurst).

STEM-END BROWNING appeared early in the spring in N.B. and a high percentage of tubers were affected in a few lots (C.H. Godwin). It was also recorded in one lot of Irish Cobbler in March 1944 in P.E.I. (R.R. Hurst).

SUN SCALD appeared to have affected several fields of Irish Cobbler and Warba intended for the early market in N.S. Most of the top leaflets, particularly of Warba, were killed. A heavy rain in the night was followed by a burst of hot sunshine next day. Shaded parts of the field were not affected (W.K. McCulloch).

PUMPKIN

CURLY TOP (Beta virus 1) affected 30% of the plants in a plot of Connecticut Field at the Station, Summerland, B.C. (G.E. Woolliams).

YELLOWS (virus). A condition resembling yellows was found in pumpkin and squash at the Station, Fredericton, N.B., and in a field of squash in Sunbury Co. Scions from diseased plants were grafted to healthy pumpkin, squash, cucumbers and melon (Cucumis Melo). The disease was repeatedly induced in the pumpkin and squash but no symptoms appeared in cucumber and melon in three attempts to induce the disease in the latter hosts. The first symptom in squash and pumpkin was a clearing of the veins of the youngest leaves. Then followed a chlorosis and downward cupping of these leaves as they came to occupy an intermediate position on the vine. Later, as they grew older, they became very pale with prominent veins. Finally they slowly wilted and fell off. Infected vines grew slowly. The new growth bore very dwarfed chlorotic leaves and gradually developed many pale spindling shoots growing at right angles to the main stem. The vine thus had a bushy appearance and the terminal growth a staring upright habit. The flowers were dwarfed and a paler yellow than normal. Fruit were formed sparingly or entirely suppressed. Infected plants matured early. The virus is believed to be a strain of Callistephus virus 1 (D.J. MacLeod).

FROST caused severe damage to Small Sugar and other varieties of pumpkin in Queens Co., P.E.I., in June (R.R. Hurst).

RADISH

Groves and Skolko (Can. J. Research C, 22: 227-231. 1944) have described Alternaria Raphani sp. nov., which they have isolated from radish seed originating in B.C., Ont. and Que., and from seed imported from the United States. They have also isolated the fungus from spots on the pods. The fungus is probably an important pathogen of radish (I.L. Conners).

WHITE RUST (Cystopus candidus) caused a slight infection on the leaves of some seed plants at Morden, Man. (W.L. Gordon).

DOWNY MILDEW (Peronospora Brassicae). Infection was moderate on the leaves and moderate to very severe on the stems and pods of 90% of the plants in a 1/10-acre seed plot of Saxa belonging to Division of Horticulture at Ottawa, Ont. Many pods were quite small with shrivelled tips. A slight infection of white rust was also present on the pods of a few plants near infected weeds. In seed plots of Scarlet Turnip White Tip, infection was a trace to slight on the leaves and on a few pods (R.G. Atkinson).

CLUB ROOT (Plasmodiophora Brassicae) severely affected 10% of White Icicle in a garden in Queens Co., P.E.I. (R.R. Hurst).

BROWN HEART (boron deficiency). A trace was observed in Early Scarlet Globe in a garden in Queens Co., P.E.I. (R.R. Hurst).

PROLIFERATION (cause unknown). Less than 1% of the Scarlet Globe plants were affected in a seed plot at the Station, Summerland, B.C. (G.E. Woolliams).

STERILITY (cause unknown). A trace was observed in one garden in Queens Co., P.E.I. (R.R. Hurst).

RHUBARB

LEAF SPOT (Ascochyta Rhei). A moderate to severe infection was widespread at Morden, Man. (W.L. Grodon). Part of this collection was deposited at Ottawa. Examination revealed pycnidia to be scarce and containing few spores. Spores of Ascochyta type were 15.0-17.5 x 3.0-4.2 microns and the Phyllosticta type 3.2-5.5 x 1.5-2.0 microns. Despite the many reports of rhubarb leaf spots due to Ascochyta and Phyllosticta received in past years, only one other is backed by a specimen in the herbarium. This collection was made by H.N. Racicot at Lennoxville, Que., Sept. 1930, and assigned to A. Rhei. Different pycnidia in this specimen yielded spores as follows: Ascochyta type - 5.0-6.0 x 3.0-3.5 microns, 10.0-14.2 x 2.0-4.3 microns, 13.5-19.3 x 2.5-4.7 microns; Phyllosticta type - 4.3-9.7 x 1.5-2.6 microns. As the Phyllosticta spores were also found extruded in cirri on the leaf, they are not merely immature Ascochyta spores. On the other hand the Ascochyta spores were septate in the pycnidium. In addition

to the black pycnidia in necroctic tissue, which may yield all spore types in the same spot there were often inconspicuous nearly hyaline Phyllosticta pycnidia in the surrounding green tissue. It seems reasonable to assume that Phyllosticta Rhei Ell. & Ev. 1889, P. Halstediana Allescher (P. Rhei Ell. & Ev. 1891) and Ascochyta Rhei Ell. & Ev. are all the same organism. It is likely that Phyllosticta straminelle auct. sensu Stevens is simply one more phase of a variable organism. Phyllosticta straminella Bres., described from Rumex in Saxony, probably does not occur in North America (D.B.O. Savile).

ANTHRACNOSE (Colletotrichum erumpens auct. sensu Stevens). A moderate infection was general on the petioles of rhubarb at Morden, Man. (W.L. Gordon). It is difficult to see why the rhubarb organism should have been assigned by F.L. Stevens (Ill. Agr. Exp. Sta. Bull. 213. 1919) to this species, which Saccardo described from dead stems of Ruscus (Liliaceae). Spores were 21-25.5 x 2.2-2.8 microns. Associated with the ascervuli, were pycnidia with spores 2.5-4.5 x 1.2-1.8 microns; possibly they represent a microconidial stage (D.B.O. Savile).

LEAF SPOT (Ramularia Rhei). A severe infection was found in one garden at Edmonton, Alta. (L.E. Tyner). A slight infection was present intermixed with that of Ascochyta Rhei at Morden, Man. (W.L. Gordon). Spores were 0-3 septate, 7.1-35 x 2.0-3.0 microns. Two severely spotted leaves were received from Fr. M. Anselme, Beauceville, Que.; the fungus was abundant on one leaf (D.B.O. Savile). Previously this leaf spot was known only from the Peace River district, Alta., and P.E.I.

CROWN ROT (cause unknown) has not been as conspicuous in the past few moister years in Sask. as it was in the drier thirties (T.C. Vanterpool).

SALSIFY

WHITE RUST (Cystopus cubicus). All plants were more or less infected in plantings in the Montreal district, Que., but the damage did not appear severe (E. Lavallee). All leaves of Sandwich Island were badly rusted at the Botanical Garden, Montreal (J.E. Jacques). Heavily infected leaves were received from Fr. M. Anselme, Beauceville (I.L. Conners).

SPINACH

DOWNY MILDEW (Peronospora Spinaciae). A trace was found in a seed crop of Bloomsdale at Lavington, B.C. (G.E. Woolliams). It was abundant on the lower leaves in a planting at Winnipeg, Man. (J.E. Machacek).

YELLOWS (Callistephus virus 1). Two plants showing yellows were found in a garden at Fredericton, N.B. (D.J. MacLeod).

SQUASH

POWDERY MILDEW (Erysiphe Cichoracearum) found on one plant of Golden Hubbard at the Station, Summerland, B.C. (G.E. Woolliams).

CURLY TOP (Beta virus 1) affected 50-100% of Golden Hubbard, 20-50% of Kitchenette, and 25% of Green Hubbard in plots at the Station, Summerland, B.C. (G.E. Woolliams).

FROST caused severe damage to Hubbard and Table Queen in a garden in Queens Co., P.E.I., in June (R.R. Hurst).

SWEET CORN

EAR ROT (Fusarium moniliforme) destroyed 27% of the ears in Golden Giant and Golden Bantam in a planting in Queens Co., P.E.I. (R.R. Hurst).

BACTERIAL STALK ROT (Phytomonas dissolvens). Infection was slight to moderate in gardens at Edmonton and Lethbridge, Alta. (M.W.C.).

SMUT (Ustilago Maydis) was reported as follows: trace at Medicine Hat, Alta. (L.E. Tyner); infection general in plants in the Niagara Peninsula, Ont., but less noticeable than in 1943 (J.K. Richardson); trace recorded with specimens from Lunenburg, and Kings Co., N.S. (J.F. Hockey).

NITROGEN DEFICIENCY. An apparent lack of nitrogen, the plants being a yellowish-green colour, was very striking in Earligold and Golden Bantam in a planting in Queens Co., P.E.I. The diagnosis was confirmed by the diphenylamine test (R.R. Hurst).

SWISS CHARD

LEAF SPOT (Cercospora beticola) was moderate late in the season in 2 plantings in the Ottawa district, Ont. (D.B.O. Savile).

TAMPALA

ROOT ROT (Fusarium sp.) was severe, killing the plants in patches in a planting of tampala (Amaranthus sp.) in the University Horticultural plots at Edmonton, Alta. An unidentified species of Fusarium was consistently isolated from the rotted roots and crowns. Root rot was not observed in one other planting (M.W. Cormack).

TOBACCO

The account given below by Dr. L.W. Koch was the result of surveys conducted in the old and new tobacco belts of Ont. and from information supplied by Mr. R. Bordeleau, Assoc. Superintendent, Experimental Station, L'Assomption, Que., concerning diseases of tobacco in Que.

Diseases in the Seedbed

YELLOW PATCH (excessive nutrients) was less severe than usual and fewer cases were reported both in the old and new tobacco belts. A few seedbeds were destroyed as a result of this trouble, but in many other instances the condition occurred in mild form and was followed by almost complete recovery of the seedlings. It is thought that the prevailing high seedbed soil temperature favoured normal "breakdown" processes of the fertilizers and allowed more normal and continuous growth of seedlings than usual.

DAMPING-OFF (Pythium sp., Rhizoctonia sp. etc.) caused the loss of seedlings (burley) in some cotton-covered beds in Essex Co. shortly after germination. A survey of seedbeds during the transplanting season indicated also that damping-off was the most serious disease of flue-cured tobacco seedlings in the new tobacco belt. Many growers feel that more satisfactory control measures, e.g., spray materials, should be available for this disease.

BLACK ROOT ROT (Thielaviopsis basicola) caused little damage in seedbeds of Essex Co. However, in the new tobacco belt a short survey indicated that this disease is much more prevalent and serious in permanent A-beds than is generally realized by the growers. Of six cases of infected seedlings, only one of these showed symptoms sufficiently striking to be visible to the grower; the other cases were all mild. Infection appeared to have originated from contaminated walls. It is planned to watch this disease carefully in the new tobacco belt in order that it may not increase.

FRENCHING in mild form was observed in several seedbeds.

BLACKLEG (Erwinea? aroideae) was recorded from the Cottam and Rodney areas on seedlings of burley tobacco. Damage was slight.

DOWNY MILDEW or BLUE MOULD (Peronospora tabacina) was neither reported nor observed this past year following its re-occurrence in 1943. Weather conditions may have proved limiting.

MUSHROOMS caused moderate damage to seedbeds of burley tobacco in certain areas of Kent Co. where the practice of using manure as a base for the seedbeds is continued. A limited number of species consistently appear to be the offenders in affected seedbeds.

Diseases in the Field

BROWN ROOT ROT (cause undetermined) was severe in fields of susceptible varieties of burley tobacco in Essex Co where corn was the preceding crop. In the burley varietal resistance plots at Harrow differences were much more pronounced than last year. The new variety, Haronova, appeared to have some measure of resistance to brown root rot in spite of the fact that all other varieties showing any resistance to black root rot are susceptible to brown root rot.

BLACK ROOT ROT (Thielaviopsis basicola) caused less damage throughout both tobacco belts of Ont. and also in Que. than for many years. In infested soils of Essex and Kent Co., Ont., even susceptible varieties appeared to suffer little damage from this disease. The reason for this was, of course, unusually high temperatures early in the season accompanied by moderate or low rainfall.

MOSAIC (virus) caused moderate damage on flue-cured tobacco in Ont., but only in fields where tobacco was grown the previous year. The same was true in Que. While mosaic, both common tobacco virus 1 and cucumber mosaic, could be found in almost every tobacco field, the loss sustained was light because most of the disease was the result of late infection.

STREAK (virus) caused considerable loss in burley tobacco fields of the Blenheim-Erieau district. Sweet clover has been reported as the host in which the disease is carried over winter, but it is probable that some other host or hosts may also be responsible. The following facts concerning this disease are apparent in Ont.: (1) It consistently causes damage in a certain locality near Blenheim each year. (2) In other districts infection is usually limited to scattered plants throughout a field. (3) Infection and resultant damage is consistently more severe at the borders of affected fields.

FRENCHING (cause undetermined) was more common than usual both in the old and new tobacco belts of Ont. Generally speaking, the more poorly-drained fields showed more frenching than others, though where the disease occurred in field of uneven topography its presence was not consistently limited to low areas. Tests failed to show any correlation between incidence of frenching and soil reaction.

SORE SHIN (Rhizoctonia Solani) caused important damage in many flue-cured tobacco fields of both the old and new belts of Ont. Incidence of infection ranged up to 6% and damage varied widely. Close examination of plants in fields where the disease was present showed diseased plants to be leaning in one direction or another with lesions of varying size at the ground level. In cases of severe infection nearly mature plants were so weakened that they often broke off completely at the point of infection in a wind.

This disease has, during the past few years, become much more serious than formerly. It would seem that either an unusually virulent strain of Rhizoctonia is operating in tobacco fields recently or another organism is involved.

ANGULAR LEAF SPOT (Pseudomonas angulata) was almost entirely absent from tobacco fields in Ont. during the past season. Mild damage was sustained in some fields in Que., especially those which were harvested late.

RING SPOT (virus) was observed on scattered plants in many fields throughout Ont. Damage was negligible.

TOMATO

EARLY BLIGHT (Alternaria Solani) was reported as follows: general on several varieties at the Farm, Agassiz, B.C.; Alacrity appeared to be the most susceptible (W. Jones); affected specimens received from Trail, B.C. (L.T. Richardson); slight infection in several gardens at Edmonton, Alta. (M.W.C.); slight infection at Scott, Sask. (H.W.M.); in general less severe in Lincoln Co., Ont., than in 1943 (J.K. Richardson); infected specimens received from Bobcaygeon, Ont. (L.T. Richardson); often observed in Montreal district, Que., but damage slight (E. Lavallee); heavy in many plantings in P.E.I. (R.R. Hurst).

STEM CANKER (Botrytis cinerea). Some 200-300 plants (0.1%) were affected by extensive stem cankers in a very large greenhouse planting in Louth Twp., Ont. The affected plants were a total loss. The disease appeared in spite of thorough soil sterilization and fumigation (G.C. Chamberlain).

LEAF MOULD (Cladosporium fulvum). Vetomold 121 is being grown in nearly all greenhouses in the Victoria district, B.C., and is proving resistant. The disease was severe in Alsa Craig and slight on Vetomold in one greenhouse at Haney, B.C. (W.R. Foster and J. Bosher). A severe infection occurred in a greenhouse at Lacombe, Alta., apparently as a result of poor ventilation (W.C. Broadfoot). Leaf mould was general and severe on Grand Rapids and Vetomold 121 in a fall crop at Simcoe, Ont. (G.C. Chamberlain). In the fall crop of greenhouse tomatoes in 1943 there appeared a hitherto unencountered strain of Cladosporium fulvum. This strain causes sporulating infections on Red Currant (Lycopersicum pimpinellifolium), which appears highly susceptible in young plants and decreasingly so as the plants approach maturity. V-121 is moderately to highly susceptible as are also Vetomold and Stirling Castle. L. hirsutum and L. hirsutum var. glabratum are highly resistant. In parallel inoculations with the older strains of C. fulvum V-121 retained its high degree of resistance to Form V and Vetomold its immunity to Forms I and III (D.L. Bailey). A moderate infection was present on a greenhouse crop of Earliana in Queens Co., P.E.I. in April (R.R. Hurst).

BACTERIAL CANKER (Corynebacterium michaganense). One seed crop of Kondine Red at Grand Forks, B.C., was almost a complete loss due to the widespread occurrence of bacterial canker throughout the planting. The disease was also present at Vernon (G.E. Woolliams). Slight to moderate damage occurred in the variety test at Lethbridge, Alta. Some of the affected plants appeared to recover later in the season (E. Anderson). Bacterial canker destroyed all plants in a garden, at Saskatoon, Sask. The plants were raised from the owner's seed in a commercial greenhouse, where the disease was severe in 1943 and again in 1944 causing a 25% reduction in yield. It was also found in a garden at Prince Albert (R.J. Ledingham). Most plantings were affected by bacterial canker to a varying degree in an area of one square mile south and west of Leamington, Ont. One grower stated that 20% of the fruit in his plantation was spotted (L.W. Koch).

FUSARIUM WILT (F. oxysporum f. Lycopersici) moderately affected 3% of the plants of Vetomold 121 in a greenhouse in May in Essex Co., Ont. (L.W. Koch).

LATE BLIGHT (Phytophthora infestans). A moderate infection of the fruit was recorded from Dauphin, and Grandview, Man., and Kenora, Ont. (J.E. Machacek). It was recorded "as quite common" at Toulon, Man., this year. Similarly "nearly all the tomato crop in the Rainy River district (Ont.) has been lost through this disease" (L.T. Richardson). Not a trace of late blight was found in the Montreal district, Que., although heavy losses occurred in 1942 and 1943 (E. Lavallee). For the second consecutive year late blight was general on tomatoes in eastern Que. (A. Payette). Late blight became general and destructive to tomatoes throughout N.B. after Sept. 15 (J.L. Howatt). Late blight was in general less destructive in P.E.I. than in recent years; 4 cases of severe damage were recorded (R.R. Hurst).

CANKER (Phytophthora parasitica) caused damage on Bounty in several greenhouses in Essex Co., Ont. It appeared always soon after on the later "transplantings". In certain trays the loss of plants was heavy, while in others in the same greenhouse the plants escaped entirely (L.W. Koch).

BACTERIAL SPECK (Pseudomonas tomato) severely infected 75% of the plants, in flats, of Earliana, Bison and John Baer at St. Adolphe, Man. Part of Bison seed was home grown and the pulp was removed without previous fermentation. The rest of the Bison seed and that of the other varieties were obtained from various seed houses. Infection was slight in East Kildonan, and slight but general at Morden (W.A.F. Hagborg).

DAMPING-OFF (Pythium etc.). Seedling beds of early tomatoes suffered severe damage in April and May in Essex Co., Ont.; it was severe in every greenhouse on "flat bed" (L.W. Koch).

LEAF SPOT (Septoria Lycopersici). Infection was moderate and general at East Kildonan and Manitou, Man.; and severe at Brandon and Morden (W.L.G.). During the early part of the picking season little or no leaf spot was evident in Essex Co., Ont.; by the end of the season, however, the disease was severe in some plantations (L.W. Koch). Leaf spot caused almost complete defoliation of one variety and the death of some of the lower leaves in a second at Alliston, Ont. (H.N. Racicot). Diseased specimens were received from Sioux Lookout, Ont., and Lacole, Que. (L.T. Richardson). Leaf spot was widespread and more or less severe in the Montreal district. Some fields suffered severe defoliation by the end of August (E. Lavallee).

WILT (? Verticillium albo-atrum) severely affected 4 plants in the Laboratory greenhouse, Charlottetown, P.E.I., in April (R.R. Hurst).

BACTERIAL SPOT (Xanthomonas vesicatoria). Rather severely affected fruits were received from the Army camp at Niagara, Ont. (J.K. Richardson).

FERN LEAF (virus). A few plants were severely affected in a greenhouse at Edmonton, Alta. (M.W.C.).

MOSAIC (virus) was reported as follows: prevalent chiefly in greenhouses of Chinese growers in the Victoria district, B.C. (W. Jones); odd plants infected at Brandon, Man. (W.L. Gordon). In a planting for seed purposes in Louth Twp., Ont., percentage of infected plants were: Stokesdale 80%, John Baer 4%, Suttons

Best of All 3%, and Bounty and Vetomold 1% (G.C. Chamberlain). Mosaic was present in several plantings in the Charlottetown area, P.E.I., but it was of little importance (R.R. Hurst).

PURPLE TOP (virus) affected 3 plants in a field in Sunbury Co., N.B. The virus corresponded to that described in P.D.S. 23: 77 (D.J. MacLeod). A trace was seen in Earliana in a planting in P.E.I. (R.R. Hurst).

SPOTTED WILT (virus) caused severe damage in a greenhouse at Edmonton, Alta. Specimens were sent to Dr. G.H. Berkeley; he identified the principal virus as that of spotted wilt, although cucumber mosaic and potato "X" viruses were also present (G.B. Sanford). The disease very severely affected Globonie, Labrador and Tangerine at the Botanical Garden, Montreal, Que.; the crop was a total loss (J.E. Jacques).

YELLOWS (Beta virus 1) was quite general throughout the Grand Forks and South Okanagan districts, B.C. From 1 to 3% of the plants were affected in seed crops at the Station, Summerland, B.C. (G.E. Woolliams). Up to 5% of the plants were affected in some fields in the Summerland district. The disease was more severe than usual probably because the vector overwintered abundantly as a result of a mild winter (H.R. McLarty).

BLOSSOM-END ROT (non-parasitic) was reported as follows: common in gardens on Vancouver Island, B.C. (W. Jones); damage moderate at Dauphin, Man., and severe to tomato hybrids in a greenhouse at Morden (J.E. Machacek); early crop severely damaged in Essex Co., Ont., some loss occurring in most plantations throughout the entire early tomato district with the early sets more severely affected than the later (L.W. Koch); recorded from several points in eastern Ont. (H.N. Racicot, L.T. Richardson); more severe than usual as a result of the dry season (E. Lavallee); occurred sparingly in P.E.I. (R.R. Hurst).

CHILLING. Tomato seedlings in cold frames of one grower suffered from exposure to sudden chilling winds in May in Lincoln Co., Ont. The seedlings showed as a result chlorosis of the leaf, purpling and stunting of the tips; the plants recovered later (G.C. Chamberlain).

MAGNESIUM DEFICIENCY caused moderate to severe damage in several plantings in Queens Co., P.E.I. (R.R. Hurst).

TURNIP

SCAB (*Actinomyces scabies*). Traces were seen on Swede turnips in Queens Co., P.E.I. (R.R. Hurst).

GREY LEAF SPOT (*Alternaria Brassicae*) caused moderate damage as a superficial canker on sides and crowns of roots in storage at the Station, Sidney, B.C. (W. Jones). Infection was a trace to severe on the varieties at Olds, Alta. (G.B. Sanford). It was observed in several fields in the Guelph district, Ont., in early Oct.; the damage was nil (J.D. MacLachlan).

STORAGE ROT (Botrytis cinerea) caused 10% damage to Ditmars at Deep Brook, N.S. (J.F. Hockey).

POWDERY MILDEW (Erysiphe Polygoni). A trace was observed in a field of Ditmars in P.E.I. (R.R. Hurst).

DOWNY MILDEW (Peronospora Brassicae) was general on the foliage of Laurentian stecklings from a 10-acre field which had been overwintered in the field at Ladner, B.C. It was also general on 2 seed crops at Ryder Lake (W. Jones). A slight infection was seen at East St. Paul, Winnipeg, Man. Tips of the inflorescence were swollen and abundant oospores were found in some parts (J.E. Machacek). Downy mildew was quite prevalent in various districts in Ont. in July, but it disappeared during the extended dry period later in the season (J.D. MacLachlan).

BLACK LEG (Phoma lingam). Plants were affected in one large patch in an acre field of Laurentian at Ste. Anne de la Pocatiere, Que. (R.O. Lachance). The disease affected from a trace to 27% of the Swede turnip roots in fields examined in Prince and Queens Co., P.E.I. (R.R. Hurst).

CLUB ROOT (Plasmodiophora Brassicae) was widespread in P.E.I. both in gardens and farm fields on Laurentian and other varieties. In many fields the destruction of young plants caused severe loss. One plant of Barbarea vulgaris showing club root infection from Queens Co. was brought in for identification (R.R. Hurst).

STORAGE ROT (Rhizoctonia Solani) caused considerable damage in one storage clamp at Milner, B.C. See Lauritzan, J.I., J. Agr. Research 38(2):93-108. 1929 (W. Jones).

SCLEROTINIA ROT (S. sclerotiorum) affected the roots of a few Laurentian seed plants in a field at Ladner, B.C. (W. Jones).

BLACK ROT (Xanthomonas campestris). Marginal leaf infections were general in a planting of Swede turnips at Morden, Man. (W.L. Gordon). The causal organism was isolated and found to be pathogenic on Swede turnip and cabbage. The typical symptoms of the disease were also produced on the same hosts with a cabbage isolate. This is the first record of its occurrence on Swede turnip in Man. (W.A.F. Hagborg). Approximately 95% of the seed planted in western Ont. in 1944 was disinfected. Clean crops were obtained from seed treated with mercuric chloride or semesan. The disease was not of economic importance except where the seed was untreated or where arasan had been used (J.K. Richardson). Black rot was observed in several fields including some in which treated seed was sown. In most fields, the foliage and subsequent root infection occurred late in the season (J.D. MacLachlan). Some seed crops of Swede turnips were clean, others showed a trace to 8% of the plants infected when the fields were inspected in N.S. in August. A trace was found in stecklings in October (J.F. Hockey). Traces were found in some seed stocks of Swede turnips and in some fields grown for the roots in P.E.I., but the disease caused very slight damage (R.R. Hurst).

MOSAIC (virus) affected 25% of the plants of Canadian Gem in date-of-seeding rows at the Station, Sidney, B.C. (W. Jones).

STERILTY (virus) was common in seed plots in N.B. in 1944; infection ranged from 1 to 27% (D.J. MacLeod). An occasional affected plant was observed in a field of Laurentian in Prince Co., P.E.I. (R.R. Hurst).

BOLTING (cause unknown). An occasional plant was seen affected in one field of Ditmars in P.E.I. (R.R. Hurst).

BROWN HEART or WATER CORE (boron deficiency) was very severe in many turnip districts of Western Ont. Presumably a factor was the long dry period during the growing season. More than 500 acres were sprayed. Records from a large portion of this acreage show that almost complete control was obtained where a thorough coverage of the leaves was secured. In many instances, however, control was unsatisfactory where a low pressure sprayer with only one nozzle per row was used. Plot tests indicate that a borax dust mixture will give good control even under severe water-core conditions (J.D. MacLachlan). Brown heart caused slight to severe damage to Swede turnips in P.E.I. In one planting all the roots were affected and in a second 43%. There were many complaints of the presence of brown heart in roots on the local market or being sold from house to house, but very few reports of its occurrence in turnips inspected for export were received (R.R. Hurst).

MAGNESIUM DEFICIENCY. A case of magnesium deficiency in Laurentian was observed in P.E.I.; the condition was corrected by an application of magnesium sulphate (R.R. Hurst).

VEGETABLE MARROW

GREY MOULD (*Botrytis cinerea*) caused the decay of a few seed on some plants at Duncan, B.C. Sclerotia were present on the surface of the seed (W. Jones).

WILT (*Erwinia tracheiphila*) affected a few plants at Starrs Point, N.S.; striped cucumber beetles were relatively abundant (J.F. Hockey).