III. DISEASES OF VEGETABLE AND FIELD CROPS

ASPARAGUS

RUST (Puccinia Asparagi) was general and severe in a large commercial planting of asparagus supposed to be Mary Washington at Grand Forks, B.C. This is the first time the disease was found in this field, which is several years old (H.R. McLarty). It was also quite general and severe on wild plants at Summerland; severe on a few plants at Indian Head, Sask., and very light at Saskatoon.

BEAN

ANTHRACNOSE (Colletotrichum Lindemuthianum) was general and caused moderate damage in the University plots, Vancouver, B.C. (W. Jones). Infection varied from a trace to severe on the different varieties at Winnipeg, Man.

The disease was less severe than usual in 1941 in the Montreal district and Western Quebec, probably because of the dry season. In 24 fields of Brittle Wax beans grown for seed, 7 were clean, 7 with a trace, 6 with less than 15% of the plants affected and 4 with 15-60% (E. Lavallee). It was also observed in Kamouraska Co. (D. Leblond)

Pencil Pod, the popular variety, was heavily infected in many gardens in P.E.I. In 6 gardens, to my knowledge, the crop was ruined. (R.R. Hurst)

ROOT ROT (Fusarium spp.) Scattered plants were stunted in a plot in the University garden, Winnipeg, Man.; isolations from the basal parts yielded F. Solani and F. oxysporum (W.L. Gordon). Root rot was very severe in beans sown in garden plots at Kentville, N.S.; it was also present in commercial fields, particularly in low or wet soils. (J.F. Hockey)

FOOT ROT. Fusarium oxysporum and Rhizoctonia Solani were readily isolated from a foot rot, which was attacking a single pole bean plant (Phaseolus multiflorus) at Morden, Man. (W.L. Gordon)

HALO BLIGHT (Phytomonas medicaginis var. phaseolicola was general on Black Pencil Pod in the University plots, Vancouver, B.C.; it caused considerable damage (W. Jones). Halo blight was found in several fields of beans being grown for seed located at Lavington, Kelowna, Kamloops and Vernon. Up to 50% of the plants were affected and in one field pod infection was present. (G.E. Woolliams)

BACTERIAL BLIGHTS (Phytomonas medicaginis var. phaseolicola and P. phaseoli) caused moderate to severe damage in several fields at Lethbridge, Alta., and in gardens at Calgary and Edmonton; infection in the varietal plots ranged from a trace to severe at Lethbridge, slight to moderate at Beaverlodge, and a trace at Lacombe. Bacterial blight was general throughout Man. Infections varied from slight to severe, depending upon location, variety, weather conditions, etc. This is the most destructive disease of beans in Man. (W.L. Gordon)

BACTERIAL BLIGHT (Phytomonas phaseoli). A slight infection was observed at Marguerite, B.C. (G.E. Woolliams). Bacterial blight was moderate to severe on Princess of Artois at Indian Head, Sask. All varieties were very free from the disease at the Station, Scott; beans were also very clean about Saskatoon. A trace of infection was present on some varieties of pole beans at Morden, Man. A slight infection only was present in localized areas in 2 five-acre fields of Robust in Ont. A thorough examination of variety plots in Lincoln Co. revealed a definite variation in the amount of disease present, but in no case was damage more than slight. (J.K. Richardson)

Bacterial blight like anthracnose (q.v.) was less prevalent than usual this year in Western Que., although it is the commonest bean disease. In 24 fields of Brittle Wax beans grown for seed, 5 were found free from disease, 6 had traces, 11 less than 10%, and 3 had over 50% of the plants infected (E. Lavallee). In 6 fields of Kidney Wax inspected, infection was 54% in one field, 2% in a second and absent in the other 4 fields; the first field was sown with registered seed, the rest with certified. Of the 20 fields of Michelite inspected, 9 were free; 3 showed trace; 3, 2-11% infection; and 5, 22-38%. In field beans at Ste. Anne de la Pocatiere, blight infection was a trace in Hunter, slight in Michelite and Burbank, moderate in Gohris and severe in Navy. Also, the only disease in the green bean plots was bacterial blight; infection ranged from a trace to 100% (Pencil Pod Black Wax) (R.O. Lachance). A trace to slight infection was found at Cape Bald, Shemogue and Port Elgin, N.B.; plants in this area suffer wind damage. In protected areas both wind damage and disease are less (S.F. Clarkson). Bacterial blight was destructive in one planting in Queens Co., P.E.I.

DAMPING-OFF (Rhizoctonia Solani chiefly) was present on varieties of string beans in gardens at Charlottetown, P.E.I. It was very destructive in one garden at Freetown. (R.R. Hurst)

RUST (Uromyces appendiculatus). A very heavy infection was observed in a commercial planting of Michelite near Chatham, Ont., but rust had developed so late that it had not seriously affected production. The pods were remarkably free from infection of any sort (A.A. Hildebrand). A few specimens of Navy bean with conspicuous pustules on the pods were received from the Farm, Nappan, N.S. (J.F. Hockey). A trace was seen on Pencil Pod in one garden in Queens Co., P.E.I.

MOSAIC (virus) was absent in most fields examined during seed inspection in B.C., and caused little damage; in one field 30% of the plants were infected (G.E. Woolliams). About 10 plants were infected in a home garden in Chambly Co., Que.; the disease was successfully transmitted (E. Lavallee). Mosaic was common in York, Sunbury, Westmorland and Kent Counties, N.B., the damage was slight (D.J. MacLeod). Traces were present in some gardens in Queens Co., P.E.I., but in one all the plants were affected. (R.R. Hurst)

BEET

SCAB (Actinomyces scabies) was common in Rimouski and about Quebec City, Que. (D. Leblond). It affected 10% of the beets in a garden in Queens Co., P.E.I.

LEAF SPOT (Cercospora beticola). Infection was general, but the damage was slight on the lower mainland and on Vancouver Island, B.C. (W. Jones). Infection was very severe on the leaves of seed beets at Rossendale, Man.; elsewhere infection was a trace to slight. In a plot at Vineland Station, Ont., infection was general, but not severe (J.K. Richardson). Leaf spot was very common in virtually every garden in P.E.I. (R.R. Hurst)

DOWNY MILDEW (Peronospora Schachtii) was found on a few plants in 2 seed crops at Milner and Agassiz, B.C. These plants were apparently infected the previous year in the steckling stage. No current season infection was noted on the neighbouring plants. (W. Jones)

LEAF SPOT (Phoma Betae) was fairly general on the lower mainland and Vancouver Island, B.C., but infection was confined to a few of the lower leaves (W. Jones). Infection was general, but not severe on lower leaves of seed plants in the northern Okanagan; a trace on the plots at Lacombe, Alta.; a trace to slight in 6 fields examined in Man.

RUST (Uromyces Betae) was found on 2 crops grown for seed and in gardens in the Sidney area, B.C. (W. Jones)

BROWN HEART (boron deficiency) was found affecting 12% of the beets in a field in Kings Co., P.E.I.; it may be more general than this one record would indicate (R.R. Hurst)

INTERNAL BLACK SPECK (boron deficiency?). A disease corresponding to the description of internal black speck given by J.C. Walker (Phytopathology 29:120-128. 1939) slightly affected garden beets at St. Roch des Aulnaies, Que. Attempts to isolate an organism were unsuccessful. Microscopic examination failed to reveal the presence of mycelium. Anatomical changes were present in the tissues which resemble those observed commonly in boron-deficient plants. (R.O. Lachance)

ROOT ROT (cause unknown) was very severe in 3 seed crops on the lower mainland, B.C., and slight in one on Vancouver Island. (W. Jones)

BROAD BEAN

POD BLIGHT (Alternaria sp.). A trace to a slight infection occurred in Windsor beans at Ile aux Coudres, Que. A species of Alternaria was constantly isolated from the blighted pods. Infection apparently takes place shortly after petal fall, while the pod is still small. (R.O. Lachance)

FOOT ROT. A single plant was affected at Brandon, Man.; isolations yielded Fusarium oxysporum, F. Solani, and F. Scirpi var. acuminatum. (W.L. Gordon)

MOSAIC (virus). A slight infection was observed in a seed crop at Keating and another at Sidney, B.C. (W. Jones). Mosaic was found in nearly all fields being grown for seed in northern Okanagan and Kamloops. Infection ranged from 2 to 40% of the plants; the yield of affected plants was reduced 50%. (G.E. Woolliams)

BROCCOLI

BLACK LEAF SPOT (Alternaria circinans) was general in a row of broccoli being grown for seed at Agassiz, B.C.; the damage was moderate. (W. Jones)

CABBAGE

BLACK LEAF SPOT (Alternaria circinans) occurred mostly on the lower leaves of plants being grown for seed in 5 fields on Vancouver Island, B.C.; the damage was slight. Pod infection has been found occasionally. A stem rot of seedlings caused by A. circinans was present in many flats belonging to Chinese growers about Vancouver. (W. Jones). It was also found on leaves of seed plants at Armstrong, B.C. (G.E. Woolliams)

HEAD ROT (Botrytis cinerea). About 1% of the heads were partially rotted by B. cinerea in one test plot in the University garden, Winnipeg, Man. This is the first record of its occurrence on cabbage in Man. (J.E. Machacek)

SOFT ROT (?Erwinia carotovora) affected the main stem of mother plants of Penn State at Marguerite, B.C., and destroyed 80% of the plants. (G.E. Woolliams)

RING SPOT (Mycosphaerella Brassicae (Fr.) Lindau) caused considerable damage to the foliage of one seed crop at Dewdney, B.C. Plenty of inoculum was present to infect the pods, which had not yet formed. Although the disease has not been previously reported to the survey, it has been noticed on cabbage at the Station, Sidney, B.C., but the fungus was immature. For an account of the disease see J.L. Weimer (J. Agr. Res. 32:97-132. 1926). (W. Jones)

BLACK ROT (Phytomonas campestris) was recorded as causing severe loss to cabbage and cauliflower in many parts of Ont. this year. It was observed also to some extent on turnips (J.E. Howitt). The disease was present to some extent in all plantings of early cabbage and cauliflower observed in Essex Co. (L.W. Koch). Black rot was a conspicuous disease in western Quebec in early September (F.S. Thatcher). The disease affected all 4 cabbages in storage in a home at Charlottetown, P.E.I.

CLUB ROOT (Plasmodiophora Brassicae) was general in truck gardens of Chinese growers in Vancouver and New Westminster districts, B.C. and caused severe damage in some. It is the most serious disease of cabbage in the coastal areas of B.C. (W. Jones). About a dozen fields were found heavily infected in Laval Co., Que., and many more were doubtlessly affected. It is the most serious disease of cabbage in the Montreal district (E. Lavallee). Malformation of the roots was apparently much less than usual, possibly due to the low seasonal moisture (F.S. Thatcher). It was also reported from Montmorency, Quebec and Sherbrooke Counties (D. Leblond). Club root severely affected 2% of the cabbage in a garden at Charlottetown, P.E.I.

DAMPING-OFF and WIRE STEM (Rhizoctonia sp.) was found causing moderate damage at Edmonton, Alta. (A.W. Henry)

MOSAIC (virus). Several plants showing typical mosaic were found in varietal plots in Lincoln Co., Ont. (J.K. Richardson).

BORON DEFICIENCY was common in a market garden at Hulton, Man. This is the first record on cabbage in Man.

CARROT

LEAF SPOT (Cercospora Apii Fres. var. Carotae Pass.). Two fields were heavily infected at Cote St. Michel, Montreal Island, Que. The carrots from one field were harvested, but all rotted in about 10 days. Those from the other were sold in bunches as harvested and no loss was suffered (E. Lavallee and F.S. Thatcher). This disease has not been previously reported in Canada, but a specimen collected Aug. 12, 1935 by Bro. Marie-Anselme at Beauceville, Que. is in the herbarium. (I.L. Conners)

ROOT ROT (Erwinia carotovora) affected 10% of the roots in one seed crop on Vancouver Island, B.C. (W. Jones). It caused losses of roots in nearly every field planted with stecklings for seed in the dry interior. Infection ranged from 10 to over 50%, but usually it was 15-20%. (G.E. Woolliams)

LEAF BLIGHT (Macrosporium Carotae) was general in one seed crop on Vancouver Island, B.C., and in some gardens on the lower mainland. (W. Jones)

BACTERIAL BLIGHT (Phytomonas carotae) was present in 83% of the fields grown for seed in the Okanagan Valley, and in the Grand Forks district, B.C. Infection on the leaves and floral parts affected 10-40% of the plants (G.E. Woolliams). Infection was generally slight, but widespread throughout Man. The causal organism was isolated and its pathogenicity proved. (W.A.F. Hagborg)

ROT (Sclerotinia sclerotiorum) caused a trace of damage in the plots at Lacombe, Alta.

YELLOWS (virus) was widely distributed in Man.; infection was generally slight, but in a plot of seed carrots at least 10% of the plants were severely affected. It affected 5% of the plants in a seed plot at Ste. Clothilde, Que. (F.S. Thatcher). Yellows was widespread in carrots in N.B. Infection ranged from 2 to 25% in 17 fields examined. Tho virus was transmitted using virus-free leafhoppers to healthy China aster and carrots, but it failed to affect Zinnia elegans. It was, therefore, identified as the type strain of Callistephus Virus 1. Carrot is probably not as recent a host in N.B. as might be supposed. Mr. W.W. Hubbard, one time Superintendent of the Station at Fredericton, as well as others, claims to have seen the disease 25 years ago (D.J. MacLeod). A survey in Annapolis and Kings Counties, N.S., showed that yellows affected 3-22% of the plants. The average infection in commercial plantings was less than 5%. It began to show up first in late July. Plantain and fall dandelion were conspicuous hosts during the season (J.F. Hockey). Infection ranged from a trace to 4% in plantings examined in P.E.I. (R.R. Hurst)

CAULIFLOWER

BLACK LEAF SPOT (Alternaria circinans) was found on the curd and leaves of 4 seed crops on the lower mainland and Vancouver Island, B.C. Inoculum was abundant for the infection of the inflorescence. Some 20% of the seedlings were infected in cold frames of one grower in October (W. Jones). Black leaf spot was severe on the flower heads of 30% of the Early Snowball plants in the University gardens, Winnipeg, Man.; a trace occurred on some other varieties. (J.E. Machacek)

SOFT ROT (Erwinia carotovora) was present in 15 seed crops on Vancouver Island and on the lower mainland, B.C.; damage was severe in some. It is the most serious disease occurring in crops grown for seed (W. Jones). A slight infection, evidently following insect injury occurred at Lilooet, B.C. (G.E. Woolliams)

DOWNY MILDEW (Peronospora Brassicae) was general on seedlings in a cold frame at Keatings, B.C., and caused much damage. (W.R. Foster and W. Newton)

BLACK ROT (Phytomonas campestris). A moderate infection was general in a garden at Parkdale, Man., and another at Hulton. This is the first record of its occurrence on cauliflower in Man. (W.L. Gordon). Two fields were found heavily infected in Laval Co., Que. (E. Lavallee)

CLUB ROOT (Plasmodiophora Brassicae) severely affected 1% of the plants in a garden in Queens Co., P.E.I.

WIRE STEM (Rhizoctonia Solani) is a serious disease in hotbeds in Laval Co., Que. Soil disinfection (1 qt. of formalin to 3 gal. water per each 6' x 12' bed) has proved effective where it has been tried in the past two years. (E. Lavallee)

WILT (Sclerotinia sclerotiorum) affected a few plants grown for seed on Lulu Island, B.C. (W. Jones)

BORON DEFICIENCY severely affected all the plants in one garden in Queens Co., P.E.I.; traces and 10% were recorded at two other locations. (R.R. Hurst)

WHIP TAIL (non-parasitic) was reported as causing severe damage on one farm at Todmorden, Ont. (J.E. Howitt)

CELERY

ROOT ROT (Botrytis cinerea) was found on Jan. 14, 1942, affecting half the plants in a case of celery grown in the Holland Marsh, Bradford, Ont. B. cinerea was isolated in every instance. (H.N. Racicot)

EARLY BLIGHT (Cercospora Apii). Slight to severe infections were recorded in the University garden, Winnipeg, Man. The disease was quite general in the Niagara Peninsula, Ont., but it was less destructive than usual. (J.K. Richardson)

SOFT ROT (Erwinia carotovora). Injury from tarnished plant bug was ocmmon in the Montreal district, Que.; soft rot bacteria had added to the loss.

ROOT ROT (Pythium spp.). Many flats of seedlings and transplants were stunted and chlorotic due to a severe necrosis of the roots in a greenhouse in Lincoln Co., Ont. All soil had been thoroughly steamed, but it was proved that infection came through the water supply.

LATE BLIGHT (Septoria Apii-graveolentis) was general on the foliage of celery on the market in Victoria and Vancouver, B.C. (W. Jones). A patchy development of late blight was observed on Utah and less often on Giant Pascal; some plants were severely affected. While the disease was only noted at Kelowna in 1940 (P.D.S. 20:33) and at Armstrong and Penticton in 1941, its general prevalence in 1941 was probably the result of the unusually prolonged rains from late August onward. (G.E. Woolliams). Infection was moderate in a garden at Edmonton, Alta., and in the plots at Beaverlodge. Late blight was reported as severe in 2 gardens in the Winnipeg area, Man. The disease was general but very severe only in unsprayed fields in Laval Co., Que. (E. Lavallee). Late blight rendered several fields unfit for storage. (F.S. Thatcher)

BORON DEFICIENCY. The fields visited in the Montreal district, Que. were largely free from symptoms. Growers seem to be rapidly becoming familiar with the use of boron.

HEART ROT (non-parasitic) was very destructive about Trois Pistoles, Que. (D. Leblond)

CUCUMBER

LEAF SPOT (Alternaria cucumerina) caused moderate damage to the foliage in a field grown for seed at Duncan, B.C. The organism was determined by J.W. Groves (W. Jones)

SCAB (Cladosporium cucumerinum) was reported from Sherbrooke and Montreal, Que.

ANTHRACNOSE (Colletotrichum lagenarium) caused slight damage to several crops under glass in the Olinda area, Ont., in May. (L.W. Koch)

BACTERIAL WILT (Erwinia tracheiphila) was noted twice in Laval Co., Que., but it was not severe (E. Lavallee). Wilt occurred at L'Assomption, Joliette, Soulanges and St. Hyacinthe.

WILT. About 50% of the cucumber plants wilted in a test plot in the University gardens, Winnipeg, Man.; isolations yielded Fusarium oxysporum, F. Solani, F. Scirpi var. acuminatum and F. Equiseti. Wilt was also recorded at Parkdale, but the cause was undetermined. (W.L. Gordon)

ROT KNOT (Heterodera marioni) caused moderate damage in some greenhouses in Essex Co., Ont. Damage occurred only where the soil had not been steamed for one year or more. It resulted in a shortening of the picking period. (L.W. Koch)

MYCOSPHAERELLA WILT (M. citrullina). Several plants were severely affected in a garden at Calgary, Alta. (M.W. Cormack)

STEM and FRUIT ROT (Sclerotinia sclerotiorum) caused severe damage in a greenhouse at Medicine Hat, Alta.

MOSAIC (virus) affected up to 20% of the plants in some plantings at Summerland, B.C.; a slight infection also occurred at Kelowna (G.E. Woolliams). Mosaic caused considerable loss to greenhouse cucumbers at Aldershot, Ont. (J.E. Howitt). It affected about 40% of the plants causing severe dwarfing in a small patch planted also to cucumbers in 1940 in Lincoln Co. (J.K. Richardson). Mosaic was observed in nearly all plantations in the Leamington area. Usually only scattered plants were affected and little of the fruit was distorted. In the spring greenhouse crop, an outbreak occurred in the same area after greenhouse vents were kept open. The damage was severe, as in many houses the picking period was shortened (L.W. Koch). A few diseased plants were seen in a home garden at Longueuil, Que. (E. Lavallee). Two plants were found in a field in Sunbury Co., N.B. The virus was identified as Cucumus Virus 1. (D.J. MacLeod)

EGG PLANT

Wilt (Verticillium Dahliae) was present as usual in Lincoln Co., Ont.; every planting was diseased to some extent and the majority suffered severely. The disease has become so general and losses so severe, that the growth of this crop has been reduced to small isolated plantings. (J.K. Richardson)

HOPS

DOWNY MILDEW (Pseudoperonospora Humuli) was very prevalent on susceptible varieties in early spring in the Fraser Valley, B.C. It was checked somewhat during the dry summer, but infection became fairly general on the cones during the harvesting period as the weather was rainy. In one yard at Sumas, the loss was heavy. The disease was heavy on the recently introduced varieties, Early Primrose, Gold Mine and Non-Such, the latter being fairly resistant. Some infection was also noticed on the resistant Fuggles variety. Spraying with copper fungicides is practised by all growers (W. Jones). On May 19, many basal spikes were found infected in the hop fields at Cazaville and St. Polycarpe, Que. As all the hills were kept scrupulously clean of shoots and runners throughout the season and a copper-lime dust was applied once or twice, the disease caused little damage. The dry season may have also helped in keeping the disease in check. (E. Lavallee)

POWDERY MILDEW (Sphaerotheca Humuli) was likewise prevalent in all the hop fields at Cazaville and St. Polycarpe, Que. from the middle of June onwards. The disease was completely checked where a thorough sulphuring programme of one treatment each week with a power duster was followed. (E. Lavallee)

CHLOROSIS (virus). A slight infection was noted in the Golding and Fuggles varieties in the Fraser Valley, B.C. (W. Jones)

HORSE RADISH

LEAF SPOT (Ramularia Armoraciae) was observed at Rimouski, Que. (D. Leblond)

LETTUCE

DOWNY MILDEW (Bremia Lactucae) was general on plants being grown for seed in the north and central parts of the Okanagan Valley, B.C.; the damage was little more than the destruction of some of the lower leaves (G.E. Woolliams). Downy mildew severely damaged 15% of plants in a greenhouse at Leamington, Ont. (L.W. Koch)

WET ROT (?Erwinia carotovora) affected up to 20% of the plants in the North and Central Okanagan, B.C., especially at Armstrong. Affected plants rot and die before sending out flower shoots. (G.E. Woolliams)

ANTHRACNOSE (Marssonina Panattoniana) was general but caused slight damage in the University garden, Winnipeg, Man. (J. E. Machacek)

DROP (Sclerotinia sclerotiorum) affected 2% of the plants in 3 Chinese truck gardens at North Westminster, B.C. (W. Jones). A number of varieties were moderately affected in the University gardens, Winnipeg, Man. (J.E. Machacek). A trace to slight infection was present at the Station, Ste. Anne de la Pocatiere, Que. (R.O. Lachance)

LEAF SPOT (Septoria Lactucae Pass.) was noted in one field at St. Michel, Island of Montreal. The crop had already been harvested (E. Lavallee and F.S. Thatcher). This disease has not been previously reported to the Survey.

YELLOWS (virus). About 10-15% of the plants were infected in the University garden, Winnipeg, Man. This is the first record on lettuce in Man. (J.E. Machacek). About 4% of the crop was affected at L'Assomption, Que. (F.S. Thatcher)

MELON

LEAF SPOT (Cladosporium cucumerinum) caused moderate damage in the Leamington district, Ont., but less than for several years past, due to its appearance rather late in the season. Soon after harvesting began, however, the disease was present in every plantation. (L.W. Koch)

BACTERIAL WILT (Erwinia tracheiphila). There was considerable wilt throughout Lincoln Co., Ont., particularly in plots which were infected with beetles (J.K. Richardson). Wilt caused slight damage in some plantations in the Leamington area. (L.W. Koch)

WILT (Fusarium sp.). A 3-acre field at Fonthill, Ont., was found severely infected on July 19; it was estimated that the crop will be reduced a third. (J.K. Richardson)

WET ROT (Pythium ?ultimum) was general on Zucca melon in the southern

Okanagan Valley, B.C. and caused a rapid, soft rot of the fruit in all stages of development. (G.E. Woolliams)

CURLY TOP (virus) affected 10% of the plants of Zucca melon growing at the Experimental Station, Summerland, B.C. It caused little injury to the plants. (G.E. Woolliams)

ONION

NECK ROT (Botrytis Allii) was general in the bulb crop in the Okanagan and at Grand Forks, B.C., and caused a heavy loss due to the continuous rain this fall. Some bulbs rotted while still in the field. It was also found to a small extent in mother bulbs being grown for seed (G.E. Woolliams). About 2% of the onions were found affected in a 5-acre planting in Essex Co., Ont., at harvest time (L.W. Koch). Neck rot caused heavy loss in storage in 1940-41 in onions of the Spanish type in Ont. One grower's loss was 80% of his crop from 4 acres or $1300.; bacterial soft rot may also have been a factor in some lots (G.H. Berkeley). There was only a slight infection in the crop in the Niagara Peninsula at harvest time; ideal curing weather prevailed during late September and October (J.K. Richardson). Onions markedly injured by this disease were received this year from Brantford, Markdale and Thedford. (J.E. Howitt)

FUSARIUM BULB ROT (F. oxysporum) was general in the Okanagan Valley, B.C.; it has also recently appeared at Grand Forks. The disease caused losses up to 20% and an average of 2.5%. It is most destructive to the bulb crop, but it also affects the seed mother bulbs (G.E. Woolliams). A patch of infected plants was observed in an acre field at St. Michel, Que. (E. Lavallee)

DOWNY MILDEW (Peronospora Schleideniana) was general and caused slight damage about Sidney, B.C. (W. Jones). Some infection was observed in all plantations of Sweet Spanish in Essex Co., Ont.; the disease appeared a few weeks before harvest, being later than usual, and caused slight damage (L.W. Koch). Downy mildew was severe in a ¼-acre field grown for seed in St. John Co., Que.; at least half the crop was destroyed. (E. Lavallee)

SMUT (Urocystis Cepulae) was found in the Winnipeg area, Man., in onions grown for sets, but not in other types. It appeared to be chiefly confined to the East Kildonan district, where onions have been grown on the same land for some time. Greatest infection observed was 1% of the sets. (W.L. Gordon)

OKRA

WILT (Verticillium sp.). In one plantation of okra, a new crop in Norfolk Co., Ont., 75% of the plants were affected by wilt. Plants affected by the same trouble were received from Chatham. (G.H. Berkeley and J.K Richardson)

PARSNIP

LEAF SPOT (Cercosporella Pastinacae) was found in 3 seed crops located at Langley and Duncan, B.C.; it caused moderate damage to the foliage. (W. Jones)

LEAF SPOT (Ramularia Pastinacae) was general in 12 seed crops on the lower mainland and Vancouver Island, B.C. It caused slight to moderate damage affecting both leaves, stems and to some extent the inflorescence. (W. Jones)

ROOT ROT (Sclerotinia sclerotiorum). Damage was severe in a seed crop at Dewdney, B.C., and slight in a second at Langley; some of the roots had apparently been infected in storage (W. Jones). The disease affected 2 or 3 plants of a seed crop at Vernon. (G.E. Woolliams)

PEAS

LEAF and POD SPOT (Ascochyta Pisi). Infection was a trace to slight on most varieties in the plots at Beaverlodge and Lacombe, Alta., and Ste. Anne de la Pocatiere, Que. a little of the disease was present on leaves collected by J.P. Perron from the plots at Cap d'Espoir, in the Gaspe (G.A. Scott). Small amount of this leaf spot was seen in Western Que. (F.S. Thatcher). Infection was heavy on the pods in a planting of Ryders Universal in Queens Co., P.E.I. (R.R. Hurst)

GREY MOULD (Botrytis cinerea) has affected up to 15% of the pods in some fields in Kings Co., N.S. Infection appears to be through the sepals and has penetrated affecting the green seeds. (J.F. Hockey)

POWDERY MILDEW (Erysiphe Polygoni). A severe infection was found at Edmonton, Alta. (A.W. Henry). Infection was general and severe in a field of Tall Telephone in Missisquoi Co., Que. (E. Lavallee). Powdery mildew was fairly heavy in the untreated plots at Cap d'Espoir, while it was somewhat less in the plots sprayed with Bordeaux (J.P. Perron). Diseased specimens were received from Ragueneau (D. Leblond). Infection was generally heavy in Queens Co., P.E.I. and damage severe. In one garden at Cornwall, the entire planting was destroyed. (R.R. Hurst)

ROOT ROT and WILT (Fusarium sp.) was found for the first time in the north Okanagan Valley. At present, it is restricted to a few fields and the damage is slight. The species of Fusarium has not been determined (G.E. Woolliams). A trace was present in the plots at Lacombe, Alta. Root rot was prevalent in field peas in the Nipawin area, Sask.; damage was less than 1% in any field. Scattered plants were affected by a foot rot in a plot in the University gardens, Winnipeg, Man. Isolations from the diseased basal parts yielded F. Solani and F. oxysporum (W.L. Gordon). Root rot affected numerous plantations of a canning company in Essex Co.; localized areas suffered severely in fields not too well drained (L.W. Koch). A slight amount of root rot was observed in Western Que. (F.S. Thatcher). Root rot was generally a trace to light, but occasionally moderate to severe in the plots at Ste. Anne de la Pocatiere. Root rot wiped out a planting of American Wonder in Queens Co., P.E.I. (R.R. Hurst)

DOWNY MILDEW (Peronospora Pisi) was present in all fields examined on the lower mainland and Vancouver Island, B.C. The damage was slight, being usually on the lower leaves, but occasionally on the pods (W. Jones). It was quite general and prevalent in the northern Okanagan district. The disease was

most prevalent on Tall Alderman and Dwarf Telephone (90% of the plants affected) with less on Blue Bantam and Lincoln (60%). (G.E. Woolliams)

LEAF BLOTCH (Septoria Pisi). Infection was severe in Fort Garry, Winnipeg, Man.; a trace to moderate on several varieties in the University garden, and a trace at Brandon. A trace to slight infection was noted in the plots at Ste. Anne de la Pocatiere, Que. Leaf blotch affected 10% of the lower leaves in a planting at Kentville, N.S.

RUST (Uromyces Fabae). A slight infection was present in the University plots, Vancouver, B.C. (W. Jones). It was also observed in Western Que. and Ste. Anne de la Pocatiere, and in Queens Co., P.E.I.

MOSAIC (virus). A small amount was found in some fields of peas grown for seed at Salmon Arm and Lavington, B.C. (G.E. Woolliams). A trace was seen in 2 fields near Nipawin, Sask. Mosaic was present in numerous plantations of a canning company in Essex Co., Ont.; affected plants developed very few mature peas (L.W. Koch). A slight infection was present on most varieties in test plots in Lincoln Co. (J.K. Richardson)

PEPPER

BLACK SPOT (Alternaria sp.). A sample of peppers showing black spots caused by an Alternaria were received from an Ontario point. (J.E. Howitt)

MOSAIC (virus). Infection was general in the Univeristy garden, Winnipeg, Man.; it was severe on some varieties. This is the first record from Man. (J.E. Machacek). In a planting of 1500 plants in Lincoln Co., Ont., one-third were infected with cucumber mosaic. The crop from the diseased plants was almost a total loss (J.K. Richardson). Five plants in a $\frac{1}{4}$-acre field in Sunbury Co., N.B. were affected by mosaic and streak. The virus was identified as Solanum Virus 1, strain L. on standard differentials. (D.J. MacLeod)

POTATO

The Plant Protection Division, Science Service, has supplied tabulations on the extent of the seed potato industry, the acreages of the leading varieties passing inspection, the extent that fields 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 certified seed.

Table 3 - Seed Potato Certification : Number of Fields and Acres Inspected, 1941.

Province	Number of Fields Entered	Number of Fields Passed	Fields Passed %	Number of Acres Entered	Number of Acres Passed	Acres Passed %
P.E.I.	3,812	2,532	66.4	16,912	11,185	66.1
N.S.	501	433	86.4	1,104	960	86.9
N.B.	2,535	1,561	61.6	13,366	8,697	65.1
Que.	1,400	721	51.5	2,787	1,201	43.1
Ont.	688	499	72.5	1,665	1,176	70.6
Man.	126	98	77.8	305	255	83.6
Sask.	115	89	77.4	212	132	62.3
Alta.	117	95	81.2	190	115	60.5
B.C.	519	376	72.4	1,127	684	60.7
TOTAL	9,813	6,404	65.3	37,668	24,405	64.8

Acres Entered		Acres Passed	
1940	48,111	1940	34,094
1941	37,668	1941	24,405
Decrease of 10,443 acres or 21.7%		Decrease of 9,689 acres or 28.4%	

There was a sharp contraction of the acreage of potatoes planted for certification in 1941; in addition, the percentage passing inspection was also reduced. Quite a considerable part of the acreage expansion in the previous four years was wiped out. Mosaic was, as usual, the chief cause of rejection, but leaf roll was a close second, and bacterial ring rot was also an important factor. This was largely due to the large number of rejections for leaf roll in N.B. and for bacterial ring rot in N.B. and Que.

Table 4 - Seed Potato Certification: Acreages Passed by Varieties, 1941.

Variety	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.-Alta.	B.C.	Total
Green Mountain	3,652	74	3,746	1,090	68	20	62	8,712
Irish Cobbler	6,720	195	281	84	201	182	7	7,670
Katahdin	581	336	3,357	15	538	11	47	4,885
Bliss Triumph	102	242	1,280			6	2	1,632
Netted Gem					2	139	435	576
Chippewa	43	6	8	6	274	9	8	354
Rural New Yorker					72			72
Up-to-Date	5	55					9	69
Houma	64					1		65
Warba		2			15	20	22	59
Early Ohio						55		55
Other Varieties	18	50	25	6	6	59	92	256
TOTAL	11,185	960	8,697	1,201	1,176	502	684	24,405

Table 5 - Seed Potato Certification: Fields Rejected, 1941.

Province	Mosaic	Leaf Roll	Bacterial Ring Rot	Adjacent Diseased Fields	Black Leg	Foreign Varieties	Misc.	Total
P.E.I.	652	263	1	110	107	28	119	1,280
N.S.	22	20		13	2	4	7	68
N.B.	120	469	205	77	7	89	9	974
Que.	123	35	272	121	70	8	50	679
Ont.	11	36	26	31	9	35	41	189
Man.	3	1	3	6	3	4	8	28
Sask.	5		2	3	2		14	26
Alta.	2	9		1	3		7	22
B.C.	31	32		32	1	4	43	143
TOTAL	969	863	509	394	204	172	298	3,409
Rejections as a percentage of fields:								
Entered	9.9	8.8	5.2	4.0	2.1	1.7	3.0	34.7%
Rejected	28.4	25.3	14.9	11.6	6.0	5.1	8.7	100.0%

Table 6 - Seed Potato Certification: Average Percentage of Disease Found in Fields, 1941.

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	.23	.04	.08	.23	.06	.27	.16	.18	.08
Leaf Roll	.84	.62	1.87	.25	.33	.04	.02	.49	.58
Mosaic	1.09	.69	.63	.50	.09	.12	.26	.14	.64
Fields passed (final inspection)									
Black Leg	.07	.01	.05	.06	.03	.09	.01	.01	.01
Leaf Roll	.32	.21	.36	.33	.11	.02	.02	.05	.14
Mosaic	.11	.11	.16	.29	.03	.02	.03	.01	.13

COMMON SCAB (Actinomyces scabies). High percentages of scab were present on smooth-skinned varieties in Alta. on bin inspection. Scab was also prevalent in Sask.; 5 lots could not be graded for certified seed and scab infection average 10% in the other lots inspected so far (J.W. Marritt*). One field near Winnipeg, Man. yielded a crop ungradable for certified seed (J.W. Scannell*). Common scab caused the rejection of 10,000 bushels at bin inspection in southern Ont. (O.W. Lachaine*). In general, scab infection was slight in Que. Deep scab was quite noticeable in Kamouraska Co., where fresh manure was used. The hot dry growing season probably favoured this severe infection. The average tuber infection was 2.5% in 448 bins inspected (B. Baribeau*). In trials at Montreal, Katahdin showed 1-2% scab, Irish Cobbler 10-15%, and Green Mountain all tubers severely attacked (J.E. Jacques). A slight infection was general in N.B. The severity of infection is greater on old ground. In one bin in Carleton Co., a 16% infection was found (C.H. Godwin*). In N.S., 80% of the crops were virtually free from scab; the average tuber infection was 0.5% (W.K. McCulloch*). Common scab was unimportant in in P.E.I., and was far less prevalent than in 1940 (S.G. Peppin*). It was abundant only in a few badly infested areas. (R.R. Hurst).

EARLY BLIGHT (Alternaria Solani) was fairly general and caused some damage in the coastal region of B.C. (W. Jones). It was quite general in the Armstrong district (G.E. Woolliams). A slight infection of early blight was observed in the Quebec district and a moderate infection was reported in the Chicoutimi and Lower St. Lawrence districts on account of the dry season. Early blight was present in the Saint John Valley, N.B. Weather conditions favoured its development. It increased as the season advanced, and hastened the early ripening of late varieties. Early blight was reported in Colchester Co. on July 29 and in Kings Co., N.S., on July 31. Perhaps on account of frequent rains and a cooler growing season, it did not spread rapidly. Irish Cobbler, whose yield is usually reduced by early blight, produced heavy crops. Only 2 cases of Alternaria rot were seen; it averaged 1.5% in 3,000 bushels of Irish Cobbler (W.K. McCulloch). A slight infection was noted on July 19 at Kentville. Except in certain districts such as Scott's Bay, the yield was not affected in Kings Co. (G.W. Hope). A late outbreak caused moderate injury to the plots at Charlottetown, P.E.I. Alternaria rot severely affected 10% of the tubers of Irish Cobbler on Nov. 27, 1940 in a lot in Prince Co. It was later observed in tubers from Queens and Kings Counties, and the first case this year was brought in on Nov. 23. (R.R. Hurst)

ARMILLARIA ROT (A. mellea). A few affected tubers were found in a bin of Green Mountain at Milner, B.C. by H.S. MacLeod*. (W. Jones)

GREY MOULD (Botrytis cinerea). A slight infection was observed on Irish Cobbler in Prince Co., P.E.I. (R.R. Hurst)

RHIZOCTONIA (Corticium Solani (Rhizoctonia Solani). This common disease was widely distributed as usual in Alta.; it evidently caused much loss in yield, both directly and indirectly (G.B. Sanford). Slight injury was observed in the field in Alta., and only traces of the sclerotia were found at tuber inspection, as the crops were dug before they were completely mature. In general, injury was slight in the growing crop in Sask.; but two fields were severely affected. A moderate development of sclerotia was found on bin inspection.

*District Potato Inspectors in their respective provinces.

One lot was too severely affected to be graded for certification. Sclerotial development was very heavy in Man.; wet weather delayed digging 3-4 weeks. Rhizoctonia was less prevalent than usual in Que.; it caused slight damage in the field and average tuber infection was 2.4% in 448 bins inspected. Rhizoctonia was present to some extent in every field in N.B. It was more prevalent in Bliss Triumph than in other varieties, and a few rough, knobby tubers were formed instead of a large number of small ones. This behaviour is more noticeable in fields planted on old potato ground or where potatoes are being grown a second year in succession. Rhizoctonia was reported in N.S. in 40% of the fields of Irish Cobbler, 25% of Bliss Triumph, and 30% of Katahdin, but infection was usually slight. It was first seen on July 16, and was not common until August 8. Maximum tuber infection was 50%, the average, 4%. Crops following winter rye were remarkably clean. Rhizoctonia was less prevalent than usuall in P.E.I. The sclerotia were seen much less frequently that a few years ago (S.G. Peppin). Rhizoctonia was rather severe in 2 fields in Prince Co. (R.R. Hurst)

BLACK LEG (Erwinia phytophthora) was found in 68 out of 519 fields inspected in B.C. and one field was rejected (H.S. MacLeod). No large amounts of black leg were found in Alta. in 1941, especially in the northern part of the province. Out of 117 fields, a trace occurred in 15, larger amounts in 5, 3 of which were rejected. The dry spring and early summer in many parts of Sask. were unfavourable for the development of black leg; out of 115 fields, it was present in 8, 2 of which were rejected. Out of 126 fields in Man., 3 were rejected (J.W. Scannell). In a field at Portage la Prairie, 5% of the plants were affected. (W.L. Gordon). About 50% of the plants were reported affected in a field at Shellington, Ont. (H.N. Racicot). Only 8 fields were rejected for black leg in Ont. (O.W. Lachaine). Black leg was slightly more prevalent in Que., than in 1940. Out of 1400 fields inspected, 70 were rejected. It was of little importance in the Montreal, Quebec, or Lower St. Lawrence districts, but about Chicoutimi and Lake St. John it was more prevalent than in 1940, 42 of the rejected fields being located in these districts. Seven fields were rejected in N.B. for black leg; for the past 5 years there has been no severe outbreak. Black leg was present in 36 out of 501 fields inspected in N.S. and 2 were rejected. Most of the disease was found in Irish Cobbler, while Bliss Triumph was free. Seed treatment has been neglected in recent years, except in the Bliss Triumph, which is grown for a special market. Black leg was more prevalent than usual in P.E.I.; 107 fields were rejected in 1941 compared to 20 in 1940 (S.G. Peppin). Traces were present in 17 fields of table stock; in a low area in one field 4% of the plants were affected. (R.R. Hurst)

STEM-END ROT (Fusarium Solani var. eumartii) was of little importance in Ont. this year. The disease was probably present in the fields rejected for wilt (q.v.), but it was not recorded (O.W. Lachaine). Stem-end rot was reported from Terrebonne Co., Que. on Green Mountain; it affected 15-20% of the crop. The seed used was certified seed from P.E.I. The disease was also reported affecting 20% of the tubers in a lot from Temiscouata Co. (B. Baribeau)

TUBER ROTS (Fusarium, etc.). The following fungi were isolated from rotted tubers received from points in Alta.: Fusarium caeruleum, common; F. sambucinum f. 6, very common; F. Solani, occasionally; F. avenaceum, rare;

Pythium spp., fairly common, if temperature high during October (G.B. Sanford and M.W. Cormack). The destructive rot of potatoes in storage in P.E.I. (P.D.S. 20:44) during the winter 1939-40 was due to F. oxysporum. Twelve cases of storage rot due to Fusarium were brought to the laboratory from March to May, 1941. (R.R. Hurst)

WILT (Fusarium sp.) was found in 69 out of 519 fields inspected in B.C. and caused the rejection of 5, a considerable reduction over 1940. In that year, wilt was found late in the season and was the result of infection from the soil. It was present to some extent in Man. One field was rejected in Man.; 2 in the Kenora-Dryden district in north-western Ont.; and 5 in other parts of Ontario. Wilt was present in some fields in Temiscouata and Kamouraska Counties, Que., but no fields were rejected. The disease was seen in 42 fields in N.B., but the highest infection recorded was 0.3%. Wilt was reported from 3 fields in Kings Co., N.S. Fusarium wilt was not common this year in P.E.I. (R.R. Hurst)

WILT (Fusarium and Verticillium) was present in 45% of the fields on second inspection in Alta. Only 13%, however, showed more than a trace and but 2 fields were rejected. In Sask. wilt was present in 36% of the fields and 3 fields were rejected. Fields showing the highest percentage of wilt were in the south-central part of the province.

SEED-PIECE ROT (Fusarium, Phytophthora, Alternaria) caused many misses in potato fields in P.E.I.; occasionally up to 75% of the sets were decayed and the field had to be replanted. (R.R. Hurst)

PSYLLID YELLOWS (Paratrioza cockerelli). Neither yellows nor psyllids were seen in fields inspected for certification in Alta. and certified seed stocks were very free from necrosis this year (J.W. Marritt). "Phloem necrosis" was observed only in the experimental plots in the immediate proximity of an infested greenhouse at the Station, Lethbridge, Alta. (G.B. Sanford)

BACTERIAL RING ROT (Phytomonas sepedonica). A survey for bacterial ring rot was made in September in southern Alta. by the Alberta Department of Agriculture. Almost every farm under irrigation about Lethbridge was visited with a less detailed survey at Medicine Hat and the irrigated area embracing Barnwell-Taber, Raymond and Welling. Lack of sunshine, rain, frost and hail made the detection of the disease difficult. Its presence was verified in every case by a microscopic examination by L.E. Tyner, Dominion Laboratory of Plant Pathology, Edmonton. Bacterial ring rot was found in 693 acres of potatoes in 102 farms out of 430 inspected. The affected farms were in 16 townships. The disease is evidently still on the increase. Not only the number of farms has increased, but it is spread over a greater area. The persistence and spread of ring rot appears to be due largely to the continued use of infected seed. Some growers planted again their own diseased stock, contrary to advice, while some affected stock found its way into seed channels and thus spread the disease to additional farms. On the other hand, most growers now understand what is required to obtain control. Of the 73 growers, on whose farms bacterial ring rot was found in 1940, 31 apparently got rid of the disease. Many of them obtained new seed for their entire farms and most of them disinfected their planters, storage houses, and equipment. The value of certified seed was amply shown. On 62 farms, growers were using certified seed for at least part of their crop. Bacterial ring rot was found in only 2 lots of

certified seed and these were on farms where the disease was even worse in potatoes grown from the farmer's own stock. Fourteen lots of certified seed were clean, although crops from the farmer's own seed were diseased (J.L. Eaglesham). No bacterial ring rot was found in fields entered for certification in Alta. It was present, however, in fields at Medicine Hat, planted with certified seed of Irish Cobbler and Early Ohio from a carload imported from Fargo, N.D. In the fields inspected, the two varieties were being grown side by side. A high percentage of the Early Ohio plants was infected, while little disease was present in the Irish Cobbler. It is likely that the infection was carried over from the Early Ohio to the Irish Cobbler in planting operations. The seed was inspected in the spring, but no ring rot was detected at that time. (J.W. Marritt)

Bacterial ring rot was found in 2 fields inspected for certification in Sask., one located at Yorkton and the other at Norquay; it appears to have been introduced from table stock. The disease was found in table stock during spring inspection on two farms on the Pike Lake Road west of Saskatoon. A survey made in the fall by A. Blackstock, Agricultural Representative, Saskatoon, revealed the disease on 8 farms. While the potatoes showed little decay in storage, in some cases the farmers reported 10-20% of the crop left in the field. Bacterial ring rot was found on 2 fields of table stock in the Estevan district, in addition to the farm on which it was discoverd in 1940.

Bacterial ring rot was found at 5 new points in Man., viz. Rosser, Beausejour, Altona, Balmoral and Tuelon. Besides, the disease was located at 2 places, close to where it was previously noted. It was present in 3 fields entered for certification. Bacterial ring rot was found on 35 farms in Ont. where certified locally-grown seed was used; 26 cases were in fields entered for certification and 2 in bins, while the other 7 were on farms of table stock growers. Infection ranged from 0.1% to 5%. These farms were located as follows: 14 in Dufferin Co., 12 in Cochrane District, 3 each in Peel and Simcoe Counties, and one each in Carleton, Middlesex and Norfolk. The disease was also found on 6 farms of table-stock growers, who were not using certified seed; the farms were located: 3 in Dufferin Co., one in Carleton and 2 in the Nipissing District. In one field of Katahdin table stock, 50% of the crop was left in the field at digging time (O.W. Lachaine). Bacterial ring rot appears to be established in widely different parts of Ontario. Samples showing typical symptoms of the disease were received from 3 of the chief potato-growing centres in western Ontario. (J.E. Howitt)

Bacterial ring rot was found in Que. in 272 fields out of 1400 inspected and in 57 bins in 1941, as compared to 111 fields out of 1161 in 1940. Only a trace was present in most fields or a few affected tubers in the bins. The disease was exceptionally prevalent in the Lake St. John and Chicoutimi districts, where 42 fields were rejected for ring rot out of 86 inspected. The high percentage of fields infected in these areas was mostly due to the use of contaminated implements. In general, where disease-free seed was used and the premises were disinfected, the disease was found in only the odd field. Bacterial ring rot was unusually prevalent in fields planted with table stock; 5 to 35% of the plants were affected (B. Baribeau). The disease was noted in 4 farms in Western Que.; in one planted in Pontiac

Co., with certified Green Mountain seed from P.E.I., and in 4 planted in the Temiskaming District with N.B. Canada #1 potatoes. At the time of inspection, infection in the first field was 0.6% of the plants, while it was 10-35% in the 4 fields of table stock. (O.W. Lachaine)

Bacterial ring rot was found in 205 fields out of 2535 inspected for certification in N.B. The seed apparently became contaminated in most cases when it was grown for a generation or two on a farm where the disease subsequently developed. The level of infection in these stocks has remained, in the meantime, so low as not to be detected. It may be noted that growers who have taken particular pains in cleaning up their equipment and premises have apparently eliminated the disease and that many of the foundation stock growers have never had the disease on their farms (C.H. Godwin). No exact figures are available, but considerable bacterial ring rot is known to occur in table stock. (I.L. Conners)

Only one case of bacterial ring rot was found in P.E.I. in the 1941 growing season, compared to 25 cases in 1940. This case was in a field of Irish Cobbler entered for certification at Monticello. The disease was detected, however, on 2 occasions in a few tubers of the 1940 crop. In one case at Souris East, bacterial ring rot was brought in from Maine in a sample of "eyes" of Katahdin for planting about 3 years ago. (S.G. Peppin and R.R. Hurst)

LATE BLIGHT (Phytophthora infestans) was prevalent in B.C. in 1941, especially in the Fraser Valley, the lower mainland, some sections of Vancouver Island, and the Pemberton district. It was found for the first time in the Salmon Arm and Princeton districts in the interior. Late blight was first reported on June 16, in the Fraser Valley. It caused considerable damage to the foliage early in the season, thereby decreasing the yield. Rain fell frequently in September and much of the crop was dug when the soil was wet. As a result late blight rot and adverse weather conditions resulted in a loss of 25-30% of the crop in the coastal sections. Spraying is not a general practice, but its use is increasing (H.S. MacLeod). In two fields of Sebago, tuber infection was negligible, although foliage infection was considerable. Late blight was found for the first time in the southern sections of Vancouver Island (W. Jones). Late blight was found for the first time at Summerland on Oct. 7, in a single field; infection was general. (Unusually prolonged rains fell in the last week of August.) (H.R. McLarty and G.E. Woolliams).

Late blight appeared in Man. for the first time since 1928. G.R. Bisby (Fungus Flora of Man. & Sask., p. 30. 1938) reported it in Man. in both 1927 and 1928, but since then it has not been observed. Rainfall was extremely heavy from Aug. 15 to Sept. 30 with very little sunshine. Many potato fields were covered with water for a few days to a few weeks. The greatest losses occurred north of Winnipeg on the west side of the Red River and the average loss from late blight rot alone or combined with drowning was 20-25% in the Red River and Springfield districts, the largest potato-producing areas in Man. Rot affected 60-75% of the tubers in a field of Irish Cobbler, while only a trace occurred in a nearby field of Warba. An affected tuber was received from Katrine, 25 miles northwest of Portage la Prairie and the disease was reported from Rossendale, similarly situated to the southwest. Tubers inspected at Cypress River and Melbourne, still further west were free from infection (J.W. Scannell). A diseased tuber was received from Mather, southwest of Portage, but near the U.S. boundary, where considerable rot was reported. (H.N. Racicot)

Late blight was epidemic in northern Ont. and north-western Que.; the average loss was 50% of the crop and in some cases no crop was harvested. Late blight appeared late in September in Que., and infection was very slight on the foliage in most districts. In short, 1941 was not a "blight year". A few severe outbreaks of tuber rot were recorded along the lower St. Lawrence, and the losses amounted to 20% of the crop on some farms in Kamouraska and Temiscouata Counties. Bin inspection disclosed 0.75% of the tubers affected.

In N.B. the greater part of the growing season was cool and late blight appeared earlier than usual. In the latter part of August, the disease was prevalent in all parts of the province. Tuber rot was present in almost every crop and was heavy in the northern part of Victoria Co.

Late blight was widespread in N.S. in 1941. It was first reported in Kings Co. on Aug. 4, and in Colchester on Aug. 19, and it had reached epidemic proportions by Aug. 24. Thorough spraying, however, was very effective and large crops were harvested virtually free from rot. Nevertheless some heavy losses were sustained. One lot of 1,300 barrels from a field sprayed only twice was harvested, while still partly green, and packed for shipment to Cuba. Later the fungus was found fruiting vigorously in the barrels and after several attempts at regrading, the lot had to be abandoned. The average loss from rot throughout N.S. was about 4%.

The outbreak of late blight in 1941 was the worst which we have ever experienced in P.E.I. The disease was widespread, destructive and difficult to control, on account of the unusually wet and broken weather. Many fields were destroyed by late September. It was demonstrated that the best control followed the earlier applications, provided a regular schedule was maintained throughout the season. Some farmers were able to reduce blight rot appreciably by destroying the tops, while others avoided heavy losses by spraying late into the growing season. The blight resistant variety, Sebago, was outstanding. Unsprayed fields of this variety showed very little blight, and the crop was entirely free from rot. (R.R. Hurst)

SOFT ROT (Pythium ultimum) caused severe damage in tubers harvested for the early market at Nanimo and Ladysmith, B.C. Field infection was initiated through pecking by pheasants, and skinning of the tubers, and was favoured by high temperature in transit and storage. The parasite seems to be quite prevalent in the soils containing muck pockets, which soils are found in certain areas on Vancouver Island. (W. Jones)

VIOLET ROOT ROT (Rhizoctonia Crocorum) was found affecting a few tubers in a bin of Green Mountain potatoes at Milner, B.C. (W. Jones). A slight infection was found at Camrose, Alta. (A.W. Henry)

SILVER SCURF (Spondylocladium atrovirens) slightly infected a few lots in one district on the lower St. Lawrence, Que. It was observed a few times in Carleton Co., N.B., particularly in Irish Cobbler. Silver scurf was common and widespread on Irish Cobbler in storage in P.E.I. during 1940-41. About 2% of the tubers of Irish Cobbler were affected in one field in Oct. (R.R. Hurst). Very little silver scurf was found by Dec. 20 (S.G. Peppin). In a carload of certified Irish Cobblers from Morell, P.E.I., examined at Chatham, Ont., almost every tuber was affected on Jan. 2, 1942. (H.N. Racicot)

POWDERY SCAB (Spongospora subterranea) was found on one farm in Temiscouata Co., Que.; the percentage of tubers affected was small. A few affected tubers were recorded on bin inspection in Carleton Co., N.B. Powdery scab was found in 7 out of 200 lots of potatoes inspected this fall in N.S.; 0.25 to 5% of the tubers were affected. On one farm, the disease appeared in the crop on land newly broken from blueberry pasture, while the crop was clean on an adjoining piece, which had been under cultivation for many years. Several cases of powdery scab were reported in P.E.I. in 1941; in one or two instances infection was quite severe (S.G. Peppin). For the first time in several years, powdery scab has been of some importance; there would appear to be a close correlation between the weather and the disease. (R.R. Hurst)

A trace of powdery scab appeared in the laboratory greenhouse, Fredericton, N.B. The disease was very severe on U.S.D.A. seedling 41956, Kerr's Pink, and Bliss Triumph, while it was slight on Green Mountain and Irish Cobbler. (D.J. MacLeod)

WART (Synchytrium endobioticum). A few tubers affected by wart were received on Oct. 1, from a correspondent in Halifax, N.S., by Mr. J.F. Hockey, Officer-in-Charge, Dominion Laboratory of Plant Pathology, Kentville, N.S., who immediately suspected the cause of the disease and sent the material on to the Dominion Botanist for verification. These tubers were from a small garden patch of about 20 hills, some of which yielded good-sized clumps of affected tubers. The garden has been under cultivation for 60 years. The necessary clean-up and destruction of affected material was carried out at once. It is thought possible that the disease may have been there for some and was unnoticed because resistant varieties, such as Irish Cobbler, have been cultivated in recent years. Investigation of all clues as to the possible source of infection has yielded no additional information. Further search will be made next summer. The owner has guaranteed to refrain from growing potatoes on the plot, until permission to do so is again given by the Department. The garden, in the meantime, will be visited regularly to ensure that this promise is carried out. Naturally, everything is being done to prevent any spread and to uncover any other centres.

The finding of wart has long been expected, particularly at sea-port towns, where ships' stores may be unloaded from a boat and left for disposal in one way or another, without the careful inspection that a cargo would receive. Nevertheless, there is no cause for alarm, but for continued vigilance. The immediate recognition of the disease by the first officer to whom the affected material was sent is a matter of which we may well be proud and emphasizes the importance of alertness on the part of every officer. (I.L. Conners)

POUTS (Thrips sp.). An injury corresponding to that described on peanut seedlings and called "pouts" (Shear and Miller. Thrips injury of peanut seedlings, Pl. Dis. Reporter 25:19. 1941) was observed on potato seedlings at Fredericton, N.B., in Sept. The damage was severe on seedlings, but negligible on mature plants. (Jean B. Adams)

WILT (Verticillium sp.) was widely distributed in Alta., and was particularly prevalent in gardens or on land intensively cultivated. The disease appears to be definitely on the increase and probably is perpetuated mainly by infected seed stock. In one large field at Lethbridge, almost every hill was affected, and in another, 60% of the hills showed wilt. The aggregate loss must

be considerable (G.B. Sanford). Verticillium wilt was not serious in P.E.I. in 1941 for, due to the wet weather, wilted plants did not die rapidly and thus the yields were not greatly reduced as has been the case in years when the weather was warmer. In one field of Irish Cobbler near Charlottetown, 50% of the plants were affected, but with no appreciable reduction in yield. Experiments conducted in 1940 again revealed that seed treatment offers a fair measure of control. Of the commoner varieties in cultivation, Houma was resistant. (G.W. Ayers and R.R. Hurst)

LEAF ROLL (virus) was found in 43% of the fields entered for certification in B.C. and resulted in the rejection of 6%. It may be noted that the percentage of crop rejected, of which the presence of leaf roll and mosaic is the chief cause, was considerably higher on Vancouver Island and in the Fraser Valley than in other districts in B.C. This difference is apparently due to less isolation, greater aphid population, and the use of certified seed, the disease content of which approaches the limits allowable. A trace or more leaf roll occurred in 34% of the fields inspected and caused the rejection of 9 fields in Alta. Most of the affected fields were in the Edmonton, Lacombe and Brooks districts. At Brooks, the disease was in Netted Gem stock, brought into the province this spring. Its prevalence at Lacombe and Edmonton is attributed to late-season spread in 1940. For instance, in Carter's Early Favorite planted at the University, Edmonton, in 1940, over 50% of the plants were affected with leaf roll in 1941; in the same stock grown in other districts for these two years no leaf roll was found (J.W. Marritt). Leaf roll was very common and probably more severe than usual. In severe cases noted at Edmonton, Olds, Calgary and intermediate points, the foliage had a purplish colour (G.B. Sanford). Small amounts of leaf roll were found in 13% of the fields inspected in Sask.; no fields were rejected. Leaf roll was not common in Man. or in the Kenora and Rainy River districts of Ont.; however, 4 out of 64 fields inspected in the Thunder Bay area were rejected (J.W. Scannell). There was a marked decrease in the number of fields rejected for leaf roll in Ont.; in the 36 rejected fields, infection ranged from 3-7% in most fields, up to 10% in a few and 15% in one of Chippewa (O.W. Lachaine). Leaf roll appears to be increasing in Que.; a slight increase was noted in all districts. Of 1,400 fields inspected, 35 were rejected. Necrosis associated with leaf roll, according to H.N. Racicot, affected 2, 5 and 10% of the tubers received from separate parishes (B. Baribeau). Symptoms resembling leaf roll were found on all the plants in a plot of Netted Gem grown from Ont. certified seed at Ste. Clothilde, while plants of the same variety from an Idaho source appeared normal (F.S. Thatcher). The disease was more prevalent in N.B. this year than in 1940; out of 2,535 fields inspected, 467 were rejected. Many of the rejected fields had been planted with marginal material. Leaf roll was reported in 70% of the fields inspected in N.S. and 3.9% were rejected. Leaf roll is still increasing in all varieties in P.E.I.; 90% of the fields showed at least a trace and 263 fields were rejected, being 3 times the number rejected in 1940.

MOSAIC (virus) was found in 54% of the fields in B.C., and resulted in the rejection of 6%. Only 7% of the fields inspected in Alta. were affected by mosaic. The 2 rejected fields were planted with seed brought to the province this spring. Mosaic was present in 13% of the fields inspected in Sask.; they were mostly located in the Saskatoon area. In all, 5 fields were rejected. In Man. 3 fields out of 126 and in western Ont. one field out

of 119 were rejected. Only 10 fields were rejected in southern Ont. Mosaic was slightly less prevalent than usual in Que.; 123 fields were rejected. The symptoms tended to be masked. Mosaic was present in almost every field inspected in N.B. and 120 fields were rejected. Only 6 fields showed over 1% of the plants affected and the highest infection was 19%. The disease was reported in 46.7% of the fields inspected in N.S. and caused the rejection of 4.2%, a slight reduction from 1940. Mosaic was much less prevalent than in previous years in P.E.I.; rejections this year were but 60% of those in 1940.

PURPLE DWARF was observed only occasionally in Alta., compared to its relatively common occurrence in 1940 (G.B. Sanford). This trouble was observed in only 6% of the fields inspected in Alta.; high percentages were seen in only one field located at the School of Agriculture, Olds. A trace of purple dwarf was found in all fields inspected in Sask. (J.W. Marritt)

PURPLE TOP was seen chiefly in Katahdin potatoes in N.B. (C.H. Godwin).

SPINDLE TUBER (virus) was recorded as follows: Present in 4% of the fields inspected in B.C.; 6 fields rejected in Man.; 4 rejected in Ont., where the disease is on the increase, especially in Katahdin and many fields were slightly infected; slight infection in some fields in Que.; most prevalent in Irish Cobbler and Katahdin in N.B., being present in 84 fields and causing rejection of 2; not observed in the field in N.S., but many pear-shaped tubers in Katahdin, which have invariably produced plants with the symptoms of spindle tuber. No increase in spindle tuber was observed in P.E.I. (S.G. Peppin). In 12 fields of table stock, spindle tuber varied from a trace to 28%. (R.R. Hurst)

WITCHES' BROOM (virus) was present in 16% of the fields inspected in B.C. and caused the rejection of 2 fields. It is becoming quite common in Alta. and is associated with what appears to be leaf roll. A severe outbreak of this complex occurred at Olds, causing the loss of increase plots of foundation stock (G.B. Sanford). A trace was present in 8% of the fields inspected in Alta. A few affected plants were found in the North Cochrane District, Ont.

YELLOW DWARF (virus) was reported in a mild form in 2 fields inspected in B.C. (H.S. MacLeod). Six fields were rejected for yellow dwarf in Ont., 3 located in Leeds Co., and one each in Dufferin, Norfolk and Simcoe Counties (O.W. Lachaine). During the harvesting of the plots of the Division of Botany at Black Rapids, near Ottawa, Ont., 66 potato plants or over 1% were found affected by yellow dwarf. Evidence pointed to current season infection, which apparently originated from the adjacent red clover. This assumption was supported by the finding the vector, the clover leafhopper, Aceratagallia sanguinolenta, on the clover by Mr. Matthewman, Division of Entomology, in considerable numbers for the time of year. The striking feature of this outbreak was the lack of distinctive vine symptoms. Affected plants appeared to die down somewhat earlier than healthy plants. When a hill was found to contain healthy and diseased tubers, examination showed one stem almost completely dead, while the others were still fairly green. To determine the situation in the Ottawa district, a rapid survey was made in the area between Sept. 29 and Oct. 4. Examination was confined to fields being dug, culls left in the field, or an occasional bin. Yellow dwarf was found in one field at Bowesville, in another on Allumette Island, Que., and in one field and one bin on separate farms at Riceville, Ont.

No field appeared to have been severely damaged. These findings indicate that the disease is more widely scattered than has been realized, but no other conclusion can be drawn at the present time. (D.B.O. Savile and F.S. Thatcher)

FERTILIZER INJURY. About 0.5% of the potatoes, which were placed in sacks previously used for potash, were injured in a warehouse at Summerside, P.E.I.

FROST. A heavy frost damaged half the potato fields in the Lake St. John district, Que., on Aug. 23. Injury and net necrosis due to frost were also reported from many other districts. In a carload of table stock from N.B., frost affected 18 out of 23 tubers examined at Ottawa. (H.N. Racicot)

GIANT HILL was found in 29% of the fields inspected in B.C. and caused the rejection of one. Many plants suspected to be affected by giant hill were seen in fields of Green Mountain in Kings Co., N.S.

MAGNESIUM DEFICIENCY. About 1% of the plants were affected in 10 fields examined in P.E.I. (R.R. Hurst)

NET NECROSIS. Of the 70 cases of net necrosis studied in 1940-41, the cause was determined as follows: Leaf roll 19, Verticillium 8, Fusarium Solani var. eumartii 3, F. Solani var. Martii 2, F. oxysporum 7, F. Scirpi 1, F. sambucinum f. 6 4, F. caeruleum 3, F. bulbigenum 2, F. angustum 1, F. trichothecioides 2, F. sp. 2, Rhizoctonia Solani 2, psyllid necrosis 6, purple dwarf 2, frost 4, frost injury to green plants 2, unknown 2 (F.S. Thatcher). Net necrosis was rather common in N.B. in Green Mountain tubers which were affected in varying degrees. In previous years it was confined to York and Carleton Counties, but it now seems to be spreading to other areas (C.H. Godwin). Net necrosis was reported several times in table stock in P.E.I. Deep stem-end browning was more prevalent than usual, an occasional lot showing 5% of the tubers affected (S.G. Peppin)

POTASH DEFICIENCY. Typical symptoms of potash deficiency were observed in a field in Queens Co., P.E.I. (R.R. Hurst)

SPINDLING SPROUT (cause unknown) was noted in many fields of Irish Cobbler and Green Mountain in P.E.I. Several samples of affected tubers were also brought to the Laboratory. (R.R. Hurst)

PUMPKIN

POWDERY MILDEW (Erysiphe Cichoracearum) slightly infected some small pie pumpkins at the Station, Summerland, B.C. (G.E. Woolliams)

RADISH

CLUB ROOT (Plasmodiophora Brassicae). About 1% of the plants were affected in a garden at Charlottetown, P.E.I.

BROWNING (boron deficiency) affected 15% of the radishes in a second planting in Queens Co., P.E.I.

PROLIFERATION (cause unknown) was general in the plantings at the Station, Summerland, B.C.; 9% of the plants were affected. (G.E. Woolliams)

RHUBARB

LEAF SPOT (Ascochyta Rhei). A slight scattered infection was present at Brandon, Man.

ANTHRACNOSE (Colletotrichum erumpens) caused moderate damage in a planting at Kentville, N.S.

LEAF SPOT (Phyllosticta Rhei) moderately infected a planting at Kentville, N.S.

RUST (Puccinia Phragmites). A heavy infection was recorded on Macdonald's Ruby in Fort Garry, Man. An unnamed variety in the same patch was not infected. (A.M. Brown)

STREAK (virus) caused slight damage at Indian Head, Sask.

CROWN ROT (cause unknown) caused moderate damage in plantings at Millet and Edmonton, Alta. The trouble was prevalent in the Saskatoon district, Sask., but the damage was slight. A slight amount of crown rot occurred at Indian Head.

SALSIFY

WHITE RUST (Cystopus cubicus). All the plants were attacked in a small plot on the Island of Montreal, Que., and many of the leaves dried up and died. Nevertheless, the yield was reduced only by about 5% when compared to last year's crop, when no rust appeared. (J. Emile Jacques)

SPINACH

Ascochyta Chenopodii Rostr. was found on a few seeds of King of Denmark growing at Keating, B.C. (W. Jones and Irene Mounce)

LEAF SPOT (Heterosporium variabile Cooke) was found in 19 crops grown for seed on the lower mainland and Vancouver Island, B.C.; the disease was widely distributed and caused slight to moderate damage (W. Jones). This is the first report of this disease in Canada, although it has been known in the United States since 1905.

DOWNY MILDEW (Peronospora Spinaciae) was general on the leaves in 4 crops grown for seed on Vancouver Island and the lower mainland, B.C.; damage was slight (W. Jones). The disease affected a few to 90% of the plants in seed crops in the Armstrong and Pemberton districts; little injury was caused. It was very heavy on one planting of Bloomsdale Long Standing, while a few

Scattered plants were affected in one of King of Denmark (G.E. Woolliams). A slight infection was recorded at Saskatoon, Sask. Some damage was done to the lower leaves of a seed crop of Bloomsdale Long Standing, several acres in extent, at Streetsville, Ont. (J.K. Richardson). It was reported several times in the Montreal region, Que.

MOSAIC or YELLOWS (virus) affected 20% of the plants in a fall-sown crop in Lincoln Co., Ont. A trace of mosaic was seen in a planting in Queens Co., P.E.I.

SQUASH

BACTERIAL WILT (Erwinia tracheiphila). In an isolated 3-acre field in Lincoln Co., Ont., 15-20% of the plants of Hubbard squash were affected; squash bugs were present (J.K. Richardson). About 6% of the plants were affected in a commercial planting at Waterville, N.S.; striped cucumber beetles were quite prevalent. (J.F. Hockey)

BLACK ROT (Mycosphaerella citrullina Gross.) was found affecting a few seedlings in the Laboratory greenhouse, Saanichton, B.C. (W. Jones)

SWEET CORN

SMUT (Ustilago Zeae) was general in southern Ont., but damage was slight (J.K. Richardson). A trace was observed at Macdonald College, Que. (R.O. Lachance)

SWISS CHARD

RUST (Uromyces Betae) was general on one seed crop in Sept., 1941, at Sidney, B.C.; damage was slight.

TOBACCO

These records, prepared by Dr. L.W. Koch, include information obtained by Messrs. R.J. Stallwood and F.A. Stinson in the New Tobacco Belt, from Messrs. H.F. Murwin and R.J. Haslam in the Old Belt of Ontario and from Messrs. J.E. Montreuil and R. Bordeleau, L'Assomption, for the Quebec tobacco-growing area.

Diseases in the Seedbed

BLACK LEG (Erwinia ?aroideae) causes slight damage throughout Ont. In Essex Co., damage did not occur until transplanting began. Infection was usually localized and was often confused with damping-off.

NEMATODES (Heterodera marioni). Two seedbeds in Essex Co., Ont., showed localized infestation. The plants exhibited symptoms of chlorosis and stunting.

DAMPING-OFF (Rhizoctonia sp. and Pythium sp.). Damage from damping-off was important only in canvas-covered, burley seedbeds in Essex Co.,

Ont., where moisture during the seedbed stage was higher than in other parts of Ont. and Que. By transplanting time, this disease was observed in all outside flat-beds examined. In the A-beds and greenhouses where ventilation and moisture could be controlled more satisfactorily, damage was of little economic importance. Rhizoctonia sp. appeared to be much more prevalent than Pythium sp.

BLACK ROOT ROT (Thielaviopsis basicola). Throughout the old and new tobacco belts in Ont., damage from black root rot was generally milder than for several years past. By the end of the transplanting season, it could be observed in many seedbeds in Essex and Kent Counties, but damage was slight due probably to high temperatures which prevailed during the seedbed period. Similarly, in Que., mild symptoms were observed in numerous seedbeds, but the disease caused real damage only in seedbeds:-

(1) Where the soil in the seedbed had not been changed each year, and
(2) Where disinfection or steaming of last year's seedbed soil had not been practised. In Que., two cases of severe injury were also observed in seedbeds where 1-2 in. of new seedbed soil were added to the top of last year's affected soil.

CHLOROSIS (cause unknown), which became apparent usually by a yellowing of the two centre leaves at the 4-6 leaf stage, caused some concern to growers. It appeared consistently only after cool nights and recovery invariably followed within a few days to a week.

MUSHROOMS. Considerable damage from different species of fleshy fungi was experienced in seedbeds of Kent Co., Ont. Affected seedlings were chlorotic and frequently stunted. Often the fruiting bodies became abundant in localized areas in the seedbeds and smothered the seedlings.

YELLOW PATCH (cause undetermined) was the most destructive seedbed disease of tobacco in Ont. in 1941. Twenty-one seedbeds in Essex and Kent Counties, were reported or observed to be affected. Damage varied widely. In mild cases, the plants in localized areas in the seedbeds became chlorotic and stunted. In most severe cases, seedbeds were abandoned or re-seeded. Recovery in various degrees was usually accomplished by thoroughly drying out the seedbeds for at least several days and then watering abundantly. In Norfolk Co., the condition was associated with applications of chicken manure in several severe cases. In Que. the disease caused mild damage.

Diseases in the Field

HOLLOW STALK (Erwinia aroideae). A single case of hollow stalk was observed in a plantation of burley tobacco in Essex Co., Ont. Damage was localized in a poorly-drained area of the field.

NEMATODES (Heterodera marioni) were observed in roots of flue-cured tobacco plants collected from Norfolk Co. Ont. Minor damage was evident in one field of flue tobacco on the Delhi Sub-Station and in a field in the Union district.

ANGULAR LEAF SPOT (Phytomonas angulata). Damage from this disease was much less severe than in 1940. Minor damage was observed in several fields in Essex Co. on Harrow Velvet. A few mild cases were observed in Norfolk Co.

SORE SHIN (Rhizoctonia Solani) caused important losses in Essex Co., Ont., and some damage in Norfolk Co. and in Que. The injury continued to be apparent unusually late in the season. In some fields of flue-cured tobacco near Harrow, as high as 10% of the plants were affected in various degrees of severity. Severely-affected plants often showed wilting of one or more top leaves. Large affected plants often broke off at the ground level when pushed or shaken. In all cases, the region of attack was at or near the ground level. The disease was consistently severe only where heavy crops of rye had been ploughed down and when parts of the rye plant were still incompletely decomposed.

BLACK ROOT ROT (Thielaviopsis basicola). In the Ont. tobacco-growing districts, damage from black root rot was below average. However, in the burley district of Essex Co., on the heavier soils, a number of crops of Green Briar and Halley's Special were ploughed up as a result of early infection by this fungus. Damage was of less importance in the flue-cured area of Norfolk and adjacent counties than usual, due probably to high soil temperatures and low rainfall in the early part of the season. In the latter area, were observed 2 fields, in which the damage was severe.

Due to the unusually low rainfall throughout the tobacco-growing areas of Que., damage from black root rot was mild, even on the susceptible varieties.

MOSAIC (virus). In both the old and new tobacco belts of Ont. and Que., mosaic caused little damage and was less prevalent than usual. In one case, 45% of the plants were affected in Essex Co., where tobacco followed tobacco in the rotation.

RING SPOT (virus). In the old tobacco belt in Ont., minor damage resulted from ring spot on burley varieties. One case was observed in which about 400 plants, at the edge of a field in a more or less circular area, were affected. One case was observed in Norfolk Co.

STREAK (virus) was more severe than for several years. Again this disease appeared to be limited to the Blenheim-Ridgetown area in Ont. Where the disease caused damage, affected plants were usually more numerous at the border of a plantation and in the vicinity of sweet clover. As usual, other cases were observed of single affected plants widely separated in some plantations. Two cases were observed in Norfolk Co., in one of which the tobacco followed sod (weeds and sweet clover), and in the other it followed rye.

BROWN ROOT ROT (cause undetermined) was more severe than usual in Essex Co. and milder, though more prevalent than usual, in the new tobacco belt of Ont. Severe cases could generally be traced to a preceding crop of corn. On the laboratory plots at Harrow, the burley variety, Green Briar, proved resistant for a second year as did also the variety Kelley, and a

strain of Judy's Pride, which have definitely exhibited resistance for some years past. The flue-cured variety, Yellow Mammoth, also appeared to be resistant in some commercial plantations.

FRENCHING (non-parasitic) caused localized damage in both the old and new tobacco belts of Ont. In one field, damage was severe only in a poorly-drained area.

In late August a survey of 250 fields showed 10.8% frenching, ranging from a few affected plants to large areas exhibiting mild symptoms, with occasional severely-affected plants.

FROST INJURY. Somewhat more than one million pounds of flue-cured tobacco were destroyed by frost in Norfolk County, Ont. In Que. frost damage in September was severe on flue-cured tobacco and caused losses of 1¼ to 1½ million pounds. Individual losses ranged from 15% to total loss depending on the maturity of the crop. In the Three Rivers section, losses represented about 2/3 of the production.

HAIL INJURY. Approximately one million pounds of flue-cured tobacco was destroyed by hail in Norfolk Co., Ont., during July.

LEAF SPOT (non-parasitic), which appears annually, was observed more frequently on flue-cured varieties in the new tobacco belt of Ont., though it was present also in Essex Co. and in Que. Only minor damage was caused.

LIGHTNING INJURY was observed in two plantations in Essex Co., Ont. In one of these, all plants in a circular area 60 feet in diameter were killed. In Norfolk Co., two cases were observed.

POTASH DEFICIENCY was observed to be prevalent on burley tobacco in the Leamington area of Ont. and several cases were also observed on flue tobacco in Norfolk Co.

WILT (cause undetermined). This disease, which was reported in 1939, was again present in numerous fields in Essex Co., Ont., particularly in the area north of Leamington. Both burley and flue tobacco varieties were affected. In one field, 9% of the plants were affected. A correlation appeared to exist between incidence of the disease and preceding crops of tomatoes. A severe case of wilt was observed in the Mount Pleasant area of Norfolk Co., and other mild cases appeared throughout the new belt.

MOSAIC (virus). The following additional notes were received: Confirmatory evidence has been obtained that while the virus of tobacco mosaic persists in the soil, the viruses of cucumber mosaic and tobacco streak do not (G.H. Berkeley). Since flue-cured tobacco began to be cultivated in Que., mosaic has continually increased. Today, the disease is most serious on many farms. A rye-tobacco 2-year rotation is being put into general practice as a means of checking the disease. In the Joliette district, up to 80% of the plants were affected in some fields in 1941 (F. Godbout). Three plants in a seed plot at the Laboratory, Fredericton, N.B. were affected by a necrotis XS strain of Solanum Virus 1. A definite mottle and foliar necrosis were evident. (D.J. MacLeod)

TOMATO

EARLY BLIGHT (Alternaria Solani) was general on the lower mainland and Vancouver Island, B.C. (W. Jones). A trace to slight infection was found in the varietal plots at Lacombe, Alta. A trace was recorded on leaves of several varieties in the University garden, Winnipeg, Man. (J.E. Machacek). Mixed infections of early blight and Septoria leaf spot were observed in southern, Ont. (J.K. Richardson). Early blight was observed on the Island of Orleans, Que. (D. Leblond). A general infection was observed in Hants and Kings Counties, N.S.; late in the season over 50% of the foliage was affected in one field (J.F. Hockey). A moderate infection was recorded on Sept. 12 on Bonny Best in Queens Co., P.E.I. (R.R. Hurst)

LEAF MOULD (Cladosporium fulvum) was found causing moderate damage to Vetomold in 15 greenhouses in the Victoria district, B.C. The disease was prevalent causing much damage in greenhouses in the Vancouver area. It was also found in the open in September on Vancouver Island (W. Jones and W.R. Foster). Leaf mould was less destructive this fall in greenhouses in the Harrow district, Ont., than in 1940, due to the temperature being higher than average. Where the resistant Vetomold variety was planted, infection was still quite general, indicating the widespread distribution of Strain 5. Where in a single test, the improved Vetomold V 121 was used, infection was negligible. Some damage was observed in a late field crop, where infection was widespread (L.W. Koch). Leaf mould slightly infected Earliana and Bonny Best in P.E.I. in September. (R.R. Hurst)

FRUIT ROT (Fusarium sp.) was observed on the Island of Orleans, Que. (D. Leblond)

NAILHEAD (Macrosporium tomato) caused damage towards the end of the early field crop in localized areas in Essex Co., Ont. (L.W. Koch)

PHOMA ROT (P. destructiva) was general and caused considerable damage in September in North Saanich Co., B.C.; it was the most prevalent and destructive disease affecting the fruit of the out-door crop during a wet period at harvest (W. Jones). It was observed on the Island of Orleans, Que. (D. Leblond)

BACTERIAL CANKER (Phytomonas michiganensis) was affecting 20% of the plants in a field at Vernon, B.C., in August (G.E. Woolliams). In 2 fields of the canning crop in Kent Co., Ont., 2% and 3% of the plants respectively showed fruit and foliage symptoms; the damage was slight. (L. W. Koch)

BACTERIAL SPECK (Phytomonas tomato (Okabe) Magrou) was found in 10 fields out of 12 examined in Man. The average infection was slight, but one grower in St. Vital suffered heavy losses. The pathogen was isolated from 8 different collections and each isolate was capable of reproducing the disease. The organism agrees with Okabe's original description in all respects except that it liquifies gelatine more rapidly. The disease was first observed in 1940, (P.D.S. 20:58 under the name Black Scab). (W.A.F. Hagborg)

BACTERIAL SPOT (Phytomonas vesicatoria). Affected specimens were received from Bagot, Man. The organism was isolated and its pathogenicity proved. This is the first record of its occurrence in Man. (W.A.F. Hagborg). Bacterial spot was epidemic in a few commercial plantings in Kings Co., N.S. The fields had been set out with plants, which had been raised from untreated seed. The plants were becoming defoliated by mid-August. (J.F. Hockey)

LATE BLIGHT (Phytophthora infestans) was fairly general and caused considerable damage to the fruit in gardens on the lower mainland and Vancouver Island, B.C. (W. Jones). The disease caused slight damage to the fruit in Kent Co., Ont., near the close of the canning season (L.W. Koch). Late blight was reported to have caused complete loss of the crop from 150 plants at Ste. Anne de la Pocatiere, Que.; affected fruits were submitted (H.N. Racicot). A general epidemic of late blight developed in Hants and Kent Counties, N.S. Fruit infection varied from 5 to 40%. The season was wet and cool. The most serious infection was in a planting adjacent to a potato field, where late blight appeared about 2 weeks before it was noticed on the tomatoes (J.F. Hockey). Late blight was most destructive this year in N.B. The epidemic on the tomato became established earlier than on the potato. Most of the tomatoes in gardens in York and Carleton Counties were destroyed before any appreciable amount of blight was visible on potato foliage (J.L. Howatt). The disease probably caused heavy losses throughout P.E.I. (R.R. Hurst)

BUCKEYE ROT (Phytophthora parasitica) was apparently destructive in Middlesex Co., Ont., as affected tomatoes were received from 4 growers (G.H. Berkeley). Buckeye Rot (Phytophthora terrestris) was fairly general in out-door crops during a rainy period on Vancouver Island, B.C. (W. Jones)

SOIL ROT (Rhizoctonia Solani) was observed causing damage to seedlings in numerous flats and outside seed beds for the early field crop in Essex Co., Ont. (L.W. Koch)

LEAF SPOT (Septoria Lycopersici) was more common and severe than in former years in Man. Infection varied from slight to severe. It caused less damage than usual in the early field crop in Essex Co., Ont. (L.W. Koch). Leaf spot was extremely severe in fields along the north shore of Lake Ontario. Many fields were almost defoliated by the end of August and resulted in a marked decrease in yield and the quality of fruit for canning. In other parts of Ontario the disease was less severe (J.K. Richardson). It was observed on the Island of Orleans, Que. (D. Leblond). A slight general infection was present in a few fields of Bison about Falmouth, N.S. (J.F. Hockey)

WILT (Verticillium albo-atrum) was general in greenhouses at Victoria, B.C., and caused the loss of 2-5% of the crop. (W.R. Foster)

MOSAIC and STREAK (virus) affected 50 to 100% of the plants in almost every greenhouse operated by Chinese growers about Victoria, B.C., while infection was 5-10% in 12 greenhouses of Caucasian growers. (W.R. Foster)

MOSAIC (virus) was found affecting 20% of the plants in a greenhouse at Armstrong, B.C.; affected plants were stunted and usually occurred in groups of 3-4 plants. A few affected plants were found in a field being grown for seed at Vernon (G.E. Woolliams). Mosaic was present in a greenhouse at

Edmonton, Alta. (A.W. Henry). In varietal test plots of unstaked plants in Lincoln Co., Ont., infection varied from 0-100% and averaged less than 5%; affected plants were severely damage (J.K. Richardson). Mosaic affected 85% of the plants in a greenhouse at Oromocto, N.B. The fruit was reduced in size but was marketable. The virus was identified as Nicotiana Virus 1 (D.J. MacLeod). Mosaic was very prevalent in Hants and Kings Counties, N.S., in fields adjacent to one greenhouse or in other fields planted with transplants from this source. Only a few plants were affected by streak (J.F. Hockey). Mosaic affected 15% of the plants at the Station, Charlottetown, P.E.I. (R.R. Hurst)

STREAK (virus). A few affected plants were found in a field at Vernon, B.C. (G.E. Woolliams). Streak affected 10% of the plants in a greenhouse at Oromocto, N.B. The disease was caused by a combination of Solanum Virus 1 and Nicotiana Virus 1. (D.J. MacLeod)

YELLOWS (curly top virus) was general and destructive from Summerland, B.C., southward causing up to 25% loss. The severity of infection decreased towards the north and no disease was found beyond Vernon. (G.E. Woolliams)

BLOSSOM-END ROT (non parasitic) caused slight damage in gardens at Edmonton, Grainer and St. Paul, Alta. It was commoner than usual at Saskatoon, Sask., causing slight damage; specimens were received from Glenside. Blossom-end rot was moderate on different varieties at Morden, Man.; a trace occurred on several varieties in the University garden, Winnipeg. The disease was recorded causing considerable injury in Ont. at Oakville, Humberside, Kirkton, Goderich, Red Wing and Toronto (J.E. Howitt). Blossom-end rot was abundant and destructive everywhere in Que. Blossom-end rot was reported less frequently than usual in P.E.I.

BLOTCHY RIPENING (non-parasitic) caused severe damage in one greenhouse, at Gordon Head, B.C., in June (W.R. Foster). The trouble caused very heavy losses at Charlottetown, P.E.I., in September. (G.C. Warren and R.R. Hurst)

COARSE FRUIT (cause unknown) affected 50% of the fruit in an early planting of Vetomold at Victoria, B.C., in May; affected fruit were rough and of second quality. (W.R. Foster)

POTASH HUNGER (potash deficiency) was observed in one garden at Charlottetown, P.E.I. (R.R. Hurst)

TURNIP

SCAB (*Actinomyces scabies*) was general on limed soils in Kamouraska and L'Islet Counties, Que., on Laurentian swedes and in a few cases the damage was so severe that the whole crop was unmarketable. Actinomyces has been isolated from the lesions. The disease was observed in one unlimed field, which had received a dressing of manure containing sawdust 14 years ago (R.O. Lachance). Traces were observed in P.E.I.

LEAF SPOT (Alternaria Brassicae) caused considerable damage to the foliage of Purple Top turnips at the Station, Sidney, B.C.

LEAF SPOT (Cercosporella albomaculans). Traces were observed in Queens Co., P.E.I. (R.R. Hurst)

SOFT ROT (Erwinia carotovora) affected an occasional plant both in the seed crop, and also in the commercial root crop in P.E.I. (R.R. Hurst)

DOWNY MILDEW (Peronospora Brassicae) slightly infected 6 seed crops on the lower mainland, B.C., and one at Pemberton. Usually it occurs on the leaves and only occasionally on the pods.

BLACK LEG (Phoma lingam) was found in 21 fields of seed crop. out of 24 examined. Infection was a trace to 25%; in most of the affected plants, no seed was produced because the bulb was destroyed (R.R. Hurst). The disease was also found in 6 fields grown for stecklings; infection was a trace to 5% in the infected fields. In general the disease was widespread and caused severe losses on many farms. (G.W. Ayers)

CLUB ROOT (Plasmodiophora Brassicae). In 2 fields of swedes at Lennoxville, Que., 20% and 75% of the plants respectively were affected. In general the disease was much less destructive than usual. (F.S. Thatcher). Heavy club root infection early in the growing season caused a crop failure in 3 fields in P.E.I. In fields of roots for stecklings, the disease was found in 8 fields; infection varied from a trace to 60% in the infected fields and averaged 25.6%. (G.W. Ayers)

POUTS (Thrips sp.). An injury similar to that already described on potatoes (q.v.) was also found on turnip seedlings. (Jean B. Adams)

MOSAIC (virus). A severe infection of mosaic was observed in swede turnips grown for stecklings in Annapolis Co., N.S. In one field counts of affected plants ranged from 48 to 100%; in an adjacent field 22% were affected. Mosaic has been spread, in all probability, by the practice of raising turnips for stecklings, and for seed in adjacent areas in the same field. Other fields planted with seed from the same source but isolated from the seed crop were free from mosaic. (J.F. Hockey)

BROWN HEART (boron deficiency) was quite prevalent in fields around Galt, Ont.; many of the affected turnips showed secondary rot (G.C. Chamberlain). According to Mr. W. Strong, Inspector of Fruits and Vegetables, Guelph, almost every turnip was affected by water core (brown heart) in fields of early turnips about Mildmay and Walkerton, Ont. About 10% of the turnip crop inspected showed this condition. Around Rockwood, about half the turnips developed water core in the past year. In Puslinch district on the lighter land, some fields were affected 100%. On the heavier land, only a trace of water core was found. In the other counties of the province, water core occurred only to a minor extent (J.E. Howitt). Brown heart was present in only one field in all fields of table stock surveyed in L'Islet Co. All producers had used fertilizers containing borax. The affected field had been heavily limed some 12 years ago. The trouble was corrected by applying borax

on Sept. 15, either as a spray or broadcast (R.O. Lachance). Out of 81 fields of swedes grown for stecklings which were inspected, 17 were affected by brown heart in amounts varying from a trace to 60% and averaging 7.2%. (G.W. Ayers)

FALSE BLOSSOM (cause unknown) affected a trace to 4% of the plants in 5 out of 24 fields of swedes grown for seed in P.E.I.; no seed was produced on affected plants (R.R. Hurst). This would appear to be identical with Sterility, reported below.

STERILITY (cause unknown) was again observed in seed plots of Laurentian and Wilhelmsburger varieties in York and Carleton Counties, N.B.; a trace to 2% of the plants were affected. The symptoms were described last year (P.D.S. 20:62). (D.J. MacLeod)

VEGETABLE MARROW

CURLY TOP (virus) was found in several fields of vegetable marrow being grown for seed around Grand Forks and Kelowna, B.C. Usually only a few plants were affected, but in a few fields 20-25% were diseased. (G.E. Woolliams)