III. DISEASES OF VEGETABLE AND FIELD CROPS

ASPARAGUS

ROOT ROT (Fusarium oxysporum). Two plants were severely affected by a root rot and yellowing at Lethbridge, Alta. Isolations yielded a Fusarium resembling F. oxysporum (W.C. Broadfoot). Seedling plants affected with root rot caused by a Fusarium were found in Lincoln Co., Ont., in 3 separate plantings, the seed for which was obtained from the same source. Some 30-50% of the seedlings were affected but there was considerable recovery as new shoots arose from the crown (G.C. Chamberlain).

RUST (Puccinia Asparagi). A general slight infection was found in a 2-acre field grown for canning purposes at St. Amable, Que. (E. Lavallee). A slight infection was seen at Beaumont (R.O. Lachance).

BEAN

GREY MOULD (Botrytis cinerea). A slight infection was found on the leaves of Masterpiece at the Farm, Agassiz, B.C. (W. Jones).

ANTHRACNOSE (Colletotrichum Lindemuthianum). A slight infection occurred in some varieties in the plots at Lacombe, Alta. (M.W.C.). A severe infection was observed on the green pods in a planting in Man.; spores, probably immature, 11.2-17.5 x 4-6 microns (W.A.F. Hagborg, W.L. Gordon). Anthracnose was observed in gardens and bean fields throughout Ont. in 1945 and it caused considerable loss to growers of snap beans (J.E. Howitt). A slight infection was present in field beans in the Guelph district, Ont. (J.D. MacLachlan).

Anthracnose was found in a field at St. Pie, Bagot Co., Que., and a second at Stanbridge East, Missisquoi Co. The disease is apparently becoming less prevalent than bacterial blight (E. Lavallee). Of 3 fields in the Montreal district, infection was a trace in 2 and 20% in a third (R.O. Lachance). Anthracnose affected 3-45% of the pods in the variety plots, Fredericton, N.B. (S.F. Clarkson). An outbreak of anthracnose caused severe damage in a market garden, Charlottetown, P.E.I. (R.R. Hurst).

ROOT ROT (Fusarium Solani f. Phaseoli). A few plants were affected in the plots at Agassiz and the University, Vancouver, B.C.; the organism was isolated. This is the first time the disease has been observed in the coastal section of B.C. (W. Jones). Fusarium was frequently isolated from the stems and roots of navy beans bearing sclerotia of Macrophomina Phaseoli from Kent Co., Ont. (J.J. Miller).

CHARCOAL ROT (Macrophomina Phaseoli). An examination of 16 fields of navy beans about Chatham and Ridgetown, Ont., revealed sclerotia of M. Phaseoli to be abundant on plants growing in fields on dry sandy soil but it was not found in those on heavy clay soil. Up to 80% of the plants were infected in the warm sandy soils. In a field with both north and south slopes, far more infected plants were found on the south slope than the north. (A.A.

Hildebrand, L.W. Koch, J.J. Miller). This disease was encountered on soybean in 1944 (P.D.S. 24: 32). In an extended study of charcoal rot in soybean, A.A. Hildebrand, J.J. Miller and L.W. Koch (Sci. Agric. 25(11): 690-706. 1945), found the fungus to be a facultative parasite of soybean and identified the organism parasitizing the host as M. Phaseoli (I.L. Conners).

HALO BLIGHT (Pseudomonas medicaginis var. phaseolicola) was general in a few rows of Round Pod Kidney Wax in the trial plots at the University, Vancouver, B.C. (W. Jones). A moderate infection was observed in a planting at Vivian, Man. (J.E. Machacek). Halo blight was common in snap beans in Man. The causal organism was isolated from 3 collections. Plantings of Calapproved (California Certified) beans remained free from bacterial infection throughout the season except in a few plantings where a trace of infection may have spread from nearby diseased beans (W.A.F. Hagborg). Up to 90% of the plants were affected in some plantings of snap beans in Essex Co. Ont.; the damage was severe (L.W. Koch). A moderate to heavy infection was noted on the leaves of almost every plant in a block of Corvette in the Cereal Division plots, C.E.F., Ottawa, Ont.; scattered pods were lightly and moderately affected (R.G. Atkinson).

BACTERIAL BLIGHTS (Pseudomonas medicaginis var. phaseolicola and Xanthomonas phaseoli). Infection, mostly by halo blight, was much lighter than usual in central Alta. The damage was severe in southern Alta., especially on Round Pod Kidney Wax grown for canning. Infection was slight to moderate on most varieties in the plots at Lacombe. Seed obtained from California (Calapproved) and from the Kamloops district, B.C., in 1945 gave disease-free plants at Edmonton, Lacombe and Olds (L.E. Tyner). Severe halo blight infection was found at Edmonton and Red Deer (A.W. Henry). Out of 11 fields examined in the Montreal district, Que., infection was nil in 3, trace in 2, 5-20% in 3 and 40-50% in 3 (R.O. Lachance).

CANKER (Rhizoctonia Solani) heavily infected string beans and caused severe damage in a garden at Charlottetown, P.E.I. The cankers appeared both above and below ground and caused the death of some plants (R.R. Hurst).

STEM ROT (Sclerotinia sclerotiorum) caused slight damage to Bountiful at Lacombe, Alta. (M.W.C.).

RUST (Uromyces appendiculatus). A trace infection was noted in a planting in Queens Co., P.E.I. (R.R. Hurst).

BACTERIAL BLIGHT (Xanthomonas Phaseoli). Infections of moderate severity were noted in several gardens in Winnipeg, Man.; the causal organism was isolated from 2 collections (W.A.F. Hagborg). Infection was slight to heavy on the leaves and pods of nearly all plants of Corvette field bean in the Cereal Division plots, C.E.F., Ottawa, Ont.; the same variety was affected by halo blight (q.v.). Infection was moderate to heavy on the leaves and slight to moderate on the pods of Masterpiece, Pacer, Princess of Artois, Red Kidney Wax x Unrivalled Wax, Pole No. 1, and Ace in the plots of Division of Horticulture, while it was trace to

moderate on the leaves and pods of Pencil Pod Black Wax, Round Pod Kidney Wax, and Stringless Green Pod (R.G. Atkinson). Of the 5 fields grown for certification in the Montreal district, Que., two were absolutely free from blight and 5-10% of the plants were diseased in the other three. In the Three Rivers district 5 fields grown for seed were visited; 10-15% of the plants were affected (E. Lavallee). Bacterial blight infection varied from a trace to 60% in string beans in Queens Co., P.E.I. (R.R. Hurst).

CURLY TOP (Beta virus 1). From 10 to 50% of the plants grown in the verification plots, Summerland, B.C., were infected (G.E. Woolliams).

MOSAIC (virus). From 1 to 10% of the plants were affected in the verification plots, Summerland, B.C. (G.E. Woolliams). A few plants of the tapery bean (Phaseolus acutifolius var. latifolius) were affected by mosaic at the Botanical Garden, Montreal, Que., while the asparagus bean (Vigna sesquipedalis) was more severely diseased (J.E. Jacques). A trace of mosaic Phaseolus virus 1) was found in Kentucky Wonder, Stringless Landreth and Refugee Green Sensation in a test at the Laboratory, Fredericton, N.B. (D.J. MacLeod). An entire plot of Bountiful Green Pod was severely affected at Kentville, N.S. (J.F. Hockey). Traces of mosaic were seen in 6 gardens in Queens Co., P.E.I. (R.R. Hurst).

YELLOW MOSAIC (Phaseolus virus 2). A prominent yellow mosaic affected 1% of the plants of Flageolet in a test at the Laboratory, Fredericton, N.B. The virus was transmitted by sap inoculation to Pisum sativum, Trifolium hybridum and Phaseolus vulgaris, in all of which it produced a marked yellow mosaic. It was identified as Phaseolus virus 2 (D.J. MacLeod).

CHLOROSIS (lime induced) was severe on beans at Stony Mountain, Winnipeg, and Woodlands, Man. (J.E. Machacek).

SEED DECAY. Backward growing conditions caused early sown seed to remain dormant and finally decay in several gardens about Charlottetown, P.E.I. (R.R. Hurst).

BEET

SCAB (Actinomyces scabies). A slight infection was seen at Ste. Anne de la Pocatiere, Que. (R.O. Lachance), and a trace at Charlottetown, P.E.I. (R.R. Hurst).

LEAF SPOT (Cercospora beticola). Infection was fairly general and caused slight damage in gardens and on seed crops in the coastal region of B.C. (W. Jones). Most fields were slightly infected on Isle Jesus, Laval Co., Que. (E. Lavallee). Traces were present in the Station garden, Charlottetown, P.E.I. on Sept. 2 (R.R. Hurst).

DOWNY MILDEW (Peronospora Schachtii) was prevalent on stecklings at Ladner, B.C., and in the trial grounds of the University, Vancouver. A mild epidemic occurred at Duncan on Vancouver Island in late fall on stecklings intended for the 1946 seed crop. As the disease has not been found in the

latter district previously, it is believed that it was introduced on the seed from oospores in leaf debris. The seed had been dusted with Arasan according to the grower.

Stecklings which were grown in the Fraser Valley in 1944 and which became infected with downy mildew were kept in storage until January 1945. They were then planted in the greenhouse. Systemic symptoms of downy mildew developed on the foliage from the crowns. Mycelium of the fungus was present in old leaf petioles and crown tissue. Beet seedlings grown in flats in the greenhouse became infected with downy mildew when the plants were sprayed with a spore suspension. Growers have been repeatedly warned not to plant infected stecklings for seed production (W. Jones).

Downy mildew was present on May 31 in all beet fields planted for seed in the Grand Forks district, B.C. Affected plants were stunted and frequently failed to send up flower stalks. The fungus failed to sporulate on the non-flowering plants, but there were downy mildew lesions with spore production on the stem leaves on nearly all plants that produced flowering stalks. From 50-95% of the crop was affected. This is the first record of downy mildew on beets in the interior of B.C. and it seems probable that it was introduced into the district through infected seed. Later the disease was present on 2 beet seedlings out of 6 sent to the Laboratory from Grand Forks for examination (G.E. Woolliams).

Downy mildew of beet is a relatively new disease in North America. According to L.D. Leach (Hilgardia 6: 203-251. 1931), it was first observed in the United States in 1911 in the coastal districts of California, and the first severe outbreak in that state was in 1927. This disease is now known in all the Pacific Coast states and has been reported from the coastal section of B.C. since 1940 (P.D.S. 20:31). Leach presents clear evidence that P. Schachtii is transmitted by means of the seed, the incidence in commercial seed being usually under 0.2%. It is a destructive seed crop disease (I.L.C.).

LEAF SPOT (Phoma Betae). A moderate to very heavy infection occurred on nearly all plants in a lot of Detroit Dark Red being grown for seed by the Division of Horticulture, C.E.F., Ottawa, Ont. (R.C. Atkinson).

MOSAIC (virus). A trace was found in a plot at the Station, Fredericton, N.B., and in a garden at Bathurst (D.J. MacLeod).

BLACK MUSTARD

WHITE RUST (Cystopus candidus) severely attacked the leaves and caused them to die prematurely in the Botanical Garden, Montreal, Que. (J.E. Jacques).

BROAD BEAN

MOSAIC (virus) affected 8 plants (25%) in a small garden in Fredericton, N.B.; these plants matured early (D.J. MacLeod).

STREAK (cause undetermined). About 2% of the plants showed a severe dark streaking of the leaves, stems and pods in a garden at the Station, Fredericton, N.B.; the affected plants died early in the season (D.J. MacLeod).

POD BLACKENING (cause undetermined). Pods, leaves and even the stems of Dwarf Green Gem were severely blackened in the Botanical Garden, Montreal, Que. (J.E. Jacques).

BROCCOLI

BLACK LEAF SPOT (Alternaria oleracea) slightly infected Italian Green Sprouting broccoli at the Farm, Agassiz, B.C. (W. Jones).

STERILITY (virus). Two plants showed sterility in a garden in Fredericton, N.B. The seed cases were imperfectly formed and contained only a few viable seeds. The leaves presented a striking silvery appearance; later they developed a light purplish cast. Axillary shoots developed giving the plant the appearance of a witch's broom. Healthy broccoli plants grafted with scions from these plants developed similar symptoms. The virus seems to be similar to that causing sterility in turnip and wild radish (D.J. MacLeod).

CABBAGE

BLACK LEAF SPOT (Alternaria oleracea). A slight infection was present in April on overwintered plants set out for seed production at Dewdney, B.C. (W. Jones). Black leaf spot quite heavily infected a seed crop of Golden Acre in a greenhouse of the Division of Horticulture, C.E.F., Ottawa, Ont. Purplish lesions were present mostly at the base and crotches of seed branches causing the death of the branch bearing immature pods and flowers. Similar spots occurred on many pods and, on some, A. oleracea was fruiting. Greyish spots occurred on the leaves but may be due to the same fungus according to J.W. Groves. A moderate to heavy pod infection also occurred on all plants in a small seed plot of Danish Ballhead in August; undoubtedly the seed from the crop will be infected. A trace occurred in seed plants of Golden Acre in an adjoining plot (R.G. Atkinson). The pods of one plant were affected in a plot of seed plants at Ste. Clothilde, Chateauguay Co., Que. (R.O. Lachance).

YELLOWS (Fusarium conglutinans) affected 15% of a planting of 6000 plants of Burpee's All Head at Collingwood, Ont. (G.C. Chamberlain).

RING SPOT (Mycosphaerella brassicicola) was general on and caused moderate damage to plants set out in fall 1944 at Dewdney, B.C.; immature perithecia were present in April (W. Jones).

DOWNY MILDEW (Peronospora Brassicae). Infection was general and caused slight damage on overwintered plants in a garden in mid-February 1945 at Saanichton, B.C.; the fungus was sporulating freely (W. Jones).

BLACK LEG (Phoma lingam). Where seed was untreated, black leg took high toll in some fields of early cabbage in Essex Co., Ont.; mild cases were numerous (L.W. Koch).

CLUB ROOT (Plasmodiophora Brassicae) was general and caused severe damage in a ½-acre truck crop at Marpole, B.C. (W. Jones). Club root caused severe damage in one planting of Danish Ballhead in Queens Co., P.E.I. (R.R. Hurst).

SCLEROTINIA ROT (S. sclerotiorum) ruined one head out of 12 in a garden at Edmonton, Alta. (L.E. Tyner). A slight infection occurred in a seed crop of Golden Acre in a greenhouse, Division of Horticulture, C.E.F., Ottawa, Ont. (R.G. Atkinson). A heavy infection was noted in a lot of stored cabbage in Queens Co., P.E.I. on Nov. 30 (R.R. Hurst).

CARAWAY

Sclerotia of Sclerotinia sclerotiorum were found in a threshed sample of caraway seed (Carum Carvi) received from Isle Verte, Que. (O. Caron). The identity of sclerotia was established from cultures by J.W. Groves and by comparison of sections of the sclerotia with those of authentic material under the microscope (I.L.C.).

CARROT

BLACK ROT (Alternaria radicina). Little storage rot due to this organism was noted in the Interior of B.C. in the spring of 1945; the disease has been kept in check by the use of treated seed (G.E. Woolliams). Severe damage occurred in one lot of stored carrots at Edmonton, Alta. (L.E. Tyner).

GREY MOULD ROT (Botrytis cinerea) was present in small amounts in stored carrots in the B.C. Interior in March, 1945 (G.E. Woolliams). It caused severe damage to a bushel lot in storage in Queens Co., P.E.I. (R.R. Hurst).

LEAF SPOT (Cercospora Carotae) was fairly general in the Armstrong district, B.C.; in one field 25% of the stecklings showed infection on Oct. 15 (G.E. Woolliams).

SOFT ROT (Erwinia caratovora) caused a slight amount of loss in storage in the B.C. Interior in the winter of 1945 (G.E. Woolliams). Soft rot was very severe in winter carrots in Lincoln Co., Ont., this year; up to 50% of the roots were destroyed in some instances (J.K. Richardson).

SCLEROTINIA ROT (S. sclerotiorum). Affected specimens were received from Alfred, Ont. on Dec. 27 (H.N. Racicot).

BACTERIAL BLIGHT (Xanthomonas carotae). Infection was very slight on the seed crop in the Armstrong, Vernon, and Grand Forks districts, B.C., in 1945 (G.E. Woolliams).

YELLOWS (Callistephus virus 1) was virtually absent in the seed crop about Grand Forks, B.C.; the roots for this year's crop were carefully rogued by the growers, mainly as the roots were harvested in the fall of 1944 (G.E. Woolliams). Carrot seed said to have been grown in South America yielded in 1944 a very high percentage of plants showing symptoms typical of yellows. In an experiment in 1945, 35% of the plants from this seed were affected while in a control row 180 feet long from a different seed lot, planted 6 in. distant, 7.8% of the plants developed yellows, and in a row of the same "control" seed planted 150 feet distant, 1.3% became affected by yellows. A heavy population of leaf hoppers was present during August (G.B. Sanford). In 1944, carrot yellows was widespread and frequently severe in Sask. In 1945, no serious outbreaks were seen, infection being a trace and the symptoms appearing later than in 1944 (R.J. Ledingham). Only traces of yellows were present in the 6 varieties under test at the Station, Kapuskasing, Ont. Only a few scattered plants were likewise affected in the plots, Division of Horticulture, C.E.F., Ottawa, Ont. (R.G. Atkinson). A trace of yellows was seen at Ste. Clothilde de Chateauguay, Que. (R.C. Lachance). Yellows was general in fields in Carleton, Victoria, Madawaska, York, Queens, Sunbury and Westmorland counties, N.B.; infection ranged from a trace to 17%. In a seed plot at the Fredericton Station, 9% of the plants showed severe yellows, the plants being very weak and dying early in the season. The virus had overwintered in the stecklings. An additional 1% of the plants developed yellows late in the summer due to current season infection (D.J. MacLeod). The average infection of yellows was estimated to be under 5% in N.S. and in most fields inspected it was not more than 7% (J.F. Hockey). Yellows was noted in several gardens in Queens Co., P.E.I.; a 6% infection was recorded in one (R.R. Hurst).

HEAT INJURY was observed at Brandon, Man.; roots were killed at the soil level and the tops wilted (J.E. Machacek).

CAULIFLOWER

BLACK LEAF SPOT (Alternaria oleracea) was general on the pods in Snowball at Saanichton, B.C., in Sept.; it appeared after the weather became humid as the pods were approaching maturity (W. Jones).

GREY MOULD (Botrytis cinerea) severely infected a seed crop at Ste. Anne de Bellevue, Que.; it caused slight damage on account of a die-back of some branches of the inflorescence (R. Pelletier).

CURD ROT (Erwinia carotovora). Damage was severe in one seed crop and slight in 2 others about Victoria, B.C. (W. Jones).

CLUB ROOT (Plasmodiophora Brassicae). A trace was seen in a garden at Charlottetown, P.E.I. (R.R. Hurst).

Rhizoctonia Solani was isolated from plated seed at Saanichton from B.C. crop (I. Mounce).

WILT (Sclerotinia sclerotiorum) caused the loss of 50% of the plants in one seed crop at Victoria, B.C.; lack of rotation and overwatering may have contributed to its spread. Numerous seed plants were also killed late in the season at Saanichton (W. Jones).

?MOSAIC (virus). Moderate symptoms of mosaic were observed on cauliflowers at Edmonton, Alta. (A.W. Henry).

BROWNING (boron deficiency). An affected specimen was brought to the Laboratory from a commercial garden, in Queens Co., P.E.I. (R.R. Hurst).

CELERY

EARLY BLIGHT (Cercospora Apii). A heavy infection was present in a garden in Queens Co., P.E.I. on Sept. 16 (R.R. Hurst).

LATE BLIGHT (Septoria Apii-graveolentis) was reported as follows: infection general and damage moderate in truck gardens at Marpole, B.C. (W. Jones); a light infection in some of the late-planted fields at Kelowna and Armstrong (G.E. Woolliams); spots, profuse with pycnidia, common on stalks of celery purchased from a retail store at Winnipeg, Man.; spores 30-82.5 x 1-2 microns, mostly 50-72 x 2 microns (W.L. Gordon); damage slight in Essex Co., Ont.; less severe than in 1944 (L.W. Koch); outside leaves affected in all 3 fields inspected this fall at St. Martin, Laval Co., Que.; plants were dusted, but the weather was wet in late summer (E. Lavallee); quite serious about Quebec City, greatly reducing the return in some plantings (O. Caron); infection heavy in a garden in Queens Co., P.E.I., on Sept. 8 (R.R. Hurst).

MOSAIC (virus) was found at London, Ont., and in the Laboratory plots, St. Catharines, causing considerable stunting. The virus was probably Cucumis virus 1 (G.C. Chamberlain).

BLACK HEART (non-parasitic) was reported from several of the celery growing areas of Ont. (J.E. Howitt).

CUCUMBER

GREY MOULD (Botrytis cinerea) caused slight damage to Perry's Special in greenhouses in Essex Co., Ont. (L.W. Koch).

SCAB (Cladosporium cucumerinum) caused considerable damage to the greenhouse crop in Essex Co., Ont., through disfiguring and stunting a considerable number of the fruits (L.W. Koch).

BACTERIAL WILT (Erwinia tracheiphila) infected 2-3% of the plants in several plantings in the vicinity of Aldershot, Ont. It also affected about 10% of the plants in a small planting in Lincoln Co. (G.C. Chamberlain). In 3 fields inspected at St. Martin, Laval Co., Que., half the plants were infected. It is very probable that losses were also high in many other fields (E. Lavallee). Bacterial wilt caused the loss of about 30% of the plants in the variety test plots at Macdonald College (R. Pelletier). A slight infection was noted at L'Assomption (R.O. Lachance). A trace of wilt was present in a planting at Wolfville, N.S. (J.F. Hockey).

WILT (?Fusarium spp.). Infection was slight in a planting at Dauphin and moderate in one at Winnipeg, Man. (J.E. Machacek). Fusarium wilt affected 3-5% of the plants in several plantings of Longfellow in the Aldershot area, Ont. (G.C. Chamberlain).

ANGULAR LEAF SPOT (Pseudomonas lachrymans). Affected specimens were received from Evesham, Sask. Its determination was verified by W.A.F. Hagborg. This is the first time the disease has been reported in Sask. (R.J. Ledingham). The disease threatened to become severe on field cucumbers in Essex Co., Ont., during June; the onset of dry weather appeared to arrest its progress (L.W. Koch).

MOSAIC (Cucumis virus 1) appeared near the end of the growing season in greenhouse cucumbers in Essex Co., Ont.; it affected up to 12% of the plants and caused moderate damage. Mosaic also affected up to 5% of the plants in field plantings and caused slight damage in the same area (L.W. Koch). Affected specimens were received from a greenhouse at London; it affected 5% of the plants in a field planting in Lincoln Co. and was observed causing slight damage in the plots at the Station, Vineland (G.C. Chamberlain, J.K. Richardson). All Everbearing plants were affected in varying degrees by mosaic in a plot at the Botanical Garden, Montreal, Que. (J.E. Jacques). A trace of mosaic was found on 2 farms in Sunbury Co., N.B. (D.J. MacLeod).

OEDEMA (over-watering). Affected plants were received from a greenhouse at Chelmsford, Ont. (H.N. Racicot).

POTASH STARVATION was very pronounced in warm greenhouses at Leamington, Ont., near the ond of the season; the damage was moderate (L.W. Koch).

EGG PLANT

WILT (Verticillium Dahliae). All plantings observed in Lincoln Co., Ont., were infected in varying degrees, some of the more severely affected plants being killed outright (J.K. Richardson).

ENDIVE

DROP (Sclerotinia sclerotiorum) caused moderate damage in a planting adjacent to infected lettuce at Lacombe, Alta. (M.W.C.).

HOP

DOWNY MILDEW (Pseudoperonospora Humuli) was observed on cultivated hops at Agassiz and Sardis and on escaped hops along a roadside in North Saanich, B.C. Infection was severe on Clusters in one yard, both basal and terminal shoot infection being general. The disease was prevalent on all susceptible varieties early in the season. The Fuggles variety is still virtually free from infection under conditions in the Fraser Valley (W. Jones).

HORSE RADISH

WHITE RUST (Cystopus candidus). A severe infection occurred on plants where sprinklers were employed at the Botanical Garden, Montreal, Que. (J.E. Jacques).

LEAF SPOT (Ramularia Armoraciae) was common on escaped plants along ditches of truck gardens at Marpole, B.C. (W. Jones).

LEEK

GREY MOULD (Botrytis sp.) was general in a seed crop of leek at Brentwood, B.C., affecting the flower stalks and pedicels, and seed capsules, materially reducing the yield of seed. Air drainage was poor and refuse of last year's crop lay nearby (W. Jones).

LETTUCE

GREY MOULD (Botrytis cinerea). A slight infection developed on one crop being grown for seed at Grand Forks, B.C. (G.E. Woolliams).

DOWNY MILDEW (Bremia Lactucae) was general and caused moderate damage to New York and Cos in North Saanich, at the Farm, Agassiz, and the University, Vancouver, B.C.; in one plot the infection was heavier due to overhead watering (W. Jones).

DROP (Sclerotinia sclerotiorum) affected 10% of the seed plants of New York in a planting at the Farm, Agassiz, B.C. (W. Jones). The disease caused slight to moderate damage in gardens at Edmonton and in the plots at Lacombe, Alta. (M.W.C.). A moderate infection was present on New York in a planting at Dropmore, Man. (W.A.F. Hagborg, W.L. Gordon).

LEAF SPOT (Septoria Lactucae Pass.). Mr. W.C. Moore, Mycologist, Plant Pathology Laboratory, Harpenden, England, has drawn our attention to an error in last year's report (P.D.S. 24: 47). In his note in Trans. Brit. Myc. Soc. 24: 346-349, 350 (foot note), 1940, he shows that the correct authority for the binomial, Septoria Lactucae, is Passerini and not Peck. Material of Septoria Lactucae was distributed in Thümen's Mycotheca Univ. 1295 and in Erb. Critt. Ital. 746. The latter specimen was published in

Fasc. 15 in Oct. 1878. As Moore found that a description appears on the label almost identical with that accompanying the Thümen Mycoth. univ. specimen, S. Lactucae Pass., Oct. 1878 clearly antedates S. Lactucae Peck, June, 1879. Incidentally, S. Lactucae Pass. appears without a description in Atti Soc. Critt. Ital. 2: 34. 1879, erroneously cited by Saccardo, Allescher and others as the source of the original description. Moore also discusses additional synonyms (I.L. Conners).

YELLOWS (Callistephus virus 1) was severe in 4 gardens in York Co. and 2 in Sunbury Co., N.B. (D.J. MacLeod).

TIP BURN (high temperature). Head lettuce was badly scorched by heat at St. Vital, Man. (J.E. Machacek).

MELON

LEAF SPOT (Alternaria ?cucumerina) slightly affected melons in the Aldershot area, Ont. (J.K. Richardson).

SCAB (Cladosporium cucumerinum) caused slight damage to muskmelons in Essex Co., Ont. (L.W. Koch, J.J. Miller).

ANTHRACNOSE (Colletotrichum lagenarium) appeared later and caused less damage than usual in Essex Co., Ont.

BACTERIAL WILT (Erwinia tracheiphila). Not over 2% of the plants were affected in melon plantings in Essex Co., Ont.; authentic cases were fewer than usual (L.W. Koch). Several specimens were received from the Aldershot district, Ont.; it was said to be more prevalent than usual (J.K. Richardson). The disease affected about 5% of the melon plants in one field at Laval des Rapides, Que. (R. Desmarteau).

POWDERY MILDEW (Erysiphe Cichoracearum) caused moderate damage to muskmelon in one planting in Essex Co., Ont. (L.W. Koch, J.J. Miller).

FUSARIUM WILT (F. sp.). Up to 60% of the plants were affected in plantings in Essex Co., Ont.; it was the most serious disease of muskmelons in 1945 (J.J. Miller). From 10 to 15% of the plants were affected about Aldershot. In the past few years Fusarium wilt has ranked as the most serious problem of the grower in this important melon-growing area; many growers have suffered severe losses from the disease (J.K. Richardson).

SOFT ROT (Pythium ultimum). A few muskmelon fruit on the ground rotted at Saanichton, B.C.; the fungus was isolated and its pathogenicity proven by inoculation of melons and potato tubers (W. Jones).

MOSAIC (virus) caused only slight damage to melon in Essex Co., Ont.; it was nearly absent in some plantings (L.W. Koch).

ONION

PURPLE BLOTCH (Alternaria Porri) moderately affected 20% of the plants in a planting at Portage la Prairie, Man. (J.E. Machacek).

NECK ROT (Botrytis Allii) developed mostly on onions kept in common storage over winter in the B.C. Interior and caused losses amounting to 25% of the crop in some cases. Little neck rot occurred in onions kept in cold storage (G.E. Woolliams). Damage was moderate in several lots of onions in storage at Edmonton, Alta. (M.W.C.). Neck rot was apparently more prevalent than usual in onions in storage in Sask. in the winter 1944-45, for numerous specimens were received, but generally only serious in large onions of the Spanish type. Its unusual prevalence was probably due to the lack of good curing weather in the fall of 1944 (R.J. Ledingham). Neck rot infected up to 5% of the Spanish onions in plantings in Essex Co., Ont.; it appeared to be more severe where overhead irrigation was practised (L.W. Koch). Neck rot affected 10% of the white onions in a garden in Kings Co., N.S.; it was also observed on Yellow Globe (J.F. Hockey). Neck rot caused severe damage to imported onions at Charlottetown, P.E.I., in August and gave rise to many complaints (R.R. Hurst).

SMUDGE (Colletotrichum circinans) was causing slight damage to white onions received from Blenheim, Ont. (J.J. Miller).

SOFT ROT (Erwinia carotovora) caused slight damage to a ¼ acre planting of Spanish onions in Essex Co., Ont.; up to 4% of the onions were affected (L.W. Koch).

BULB ROT (Fusarium ?oxysporum f. Cepae). Some 25% of the bulbs were reported to be rotting in a planting at Portage la Prairie, Man. (J.E. Machacek).

DOWNY MILDEW (Peronospora destructor) was observed in 2 seed crops in coastal B.C. By roguing out the affected plants when first observed, then spraying first with soft soap solution, followed with Bordeaux after the plants were dry, the disease was held in check throughout the season at Saanichton. Spraying first with the soap solution insured excellent coverage. Moreover, the weather was dry and the protective film was not washed off. At Duncan, where the disease was well advanced when first seen, the grower sprayed the seed plants as advised, first with a soap solution, 4 lb. per 100 gal., and then with lime sulphur at summer strength. As a result, he harvested a fair crop (W. Jones). Downy mildew suddenly appeared in late June in the onion seed crop of several varieties at Grand Forks and Kelowna and threatened to become epidemic. Fortunately the weather turned hot and dry in early July; the disease ceased to spread and further development on the affected plants was arrested so completely that no secondary infection by Stemphylium botryosum appeared (G.E. Woolliams).

Downy mildew infection was severe in a planting at Baldur, Man. (J.E. Machacek). The disease was prevalent and destructive in the Thedford marshes, Ont. in 1945. (J.E. Howitt). Large spots of diseased onions could be seen in most of the 30 onion fields at St. Martin, Laval Co., Que., by Aug. 31. Downy mildew appeared to be causing more damage than usual, but the

(W. Jones).

amount was difficult to assess because of the general infestation by Thrips (E. Lavallée). Infection was slight in crops grown for seed at L'Assomption and Ste. Clothilde (R.O. Lachance).

LEAF SPOT (Pleospora herbarum (Stemphylium botryosum) caused moderate damage to flowering stalks of seed plants affected with downy mildew at Duncan, B.C. (W. Jones).

SMUT (Urocystis Cepulae) infected 75% of the plants and caused a loss of half the crop in a field at Cyrville, Ont. Onions were planted in the same field in 1944, when smut was also present and no treatment was attempted (L.T. Richardson). The number of fields infected by smut slowly increases each year in the Montreal district, Que. Three or four patches were found in a newly-discovered field at St. Léonard-Port Maurice, Laval Co. (E. Lavallée).

YELLOW DWARF (virus) was found in the Vernon and Lavington districts, B.C., on Yellow Globe Danvers. An occasional affected plant was present in some fields but 25% of the plants showed yellow dwarf in one field. This disease has not been previously reported in Canada (G.E. Woolliams).

PARSLEY

LEAF SPOT (Septoria Petroselini) was general and caused slight damage in one garden in North Saanich, B.C. (W. Jones).

PARSNIP

YELLOWS (Callistephus virus 1). A slight infection occurred in a planting at the Station, Fredericton, N.B. (D.J. MacLeod).

PEA

A brief report on "Pea Diseases in Northeastern Saskatchewan in 1945" has been prepared by Dr. H.W. Mead, Dominion Laboratory of Plant Pathology, Saskatoon, Sask.

The extensive pea-growing area around Nipawin, Codette and Aylsham, Sask., was surveyed during the week of Aug. 6. At that time the crop was green, with blossoms, young pods, and well-filled pods present. Most of the plantings seen were of field peas, Dashaway and Arthur being the commonest varieties. There was a smaller acreage of garden peas, including such varieties as Laxton's Progress and British Lion. In this area, 30 fields were examined and the following diseases were recognized:

MYCOSPHAERELLA BLIGHT (M. pinodes (Ascochyta pinodes) was present on every plant in all the fields; infection in most fields was slight to moderate chiefly on the lower two-thirds of the stems and leaves. In 18 of the fields, the organism caused extensive lesions at the base of the plants but affected very few pods. Blossom blight was found in 2 fields.

LEAF AND POD SPOT (Ascochyta Pisi) was found on stems and leaves in 10 fields and on pods in 4. Infection was very light. ROOT ROT (Rhizoctonia Solani) caused slight damage in one field and WILT (Fusarium spp.) was slight to moderate in 12.

The survey was notable on account of the common occurrence of Mycosphaerella Blight. Conditions in most fields were favourable for the further development of the disease, as the stand was heavy and the soil wet.

Pea growing has expanded greatly in the area in the last 5 years. Much of the seed is supplied by one grower, but a considerable quantity was shipped in by a line-elevator company. There has been no control of the seed supply to prevent the introduction of diseased seed. Harvesting is done by combine, the straw being spread on the ground. As far as known, most of the crop is grown on summer fallowed land with very little being grown on land in peas the previous year.

Of possible wild hosts, Vicia americana was found around most fields and Lathyrus venosus in a few.

A few fields in the Kelvington area in eastern Sask. were surveyed on Aug. 25. Mycosphaerella Blight was present lightly spotting the stems and leaves of Chancellor and Dashaway peas in these fields and very lightly spotting the pods in one. Typical spots of Ascochyta Pisi were seen in one field. In general the infection was much less severe in this area than in the Nipawin-Codette area. A light infection was also noted at Saskatoon (H.W.M.).

Of the 155 samples of pea seed chiefly Arthur, Dashaway and Chancellor from Sask. examined at Ottawa by Feb. 4, 1946, 131 were from the Nipawin-Codette area and 24 from other places. Of the 131 samples from this area 6 were considered suitable for seed, 47 contained some diseased seed and it was recommended that the seed be treated before sowing and 78 (or 60% of the samples) were classed as unfit because more than 2% of the seed was infected with one or more of the parasitic species of Ascochyta. Infection in these latter samples varied from 2 to 22% and averaged about 7%. Some samples also carried Fusarium spp., infection varying from 2 to 6%, and averaging 3%. Of the 24 samples from elsewhere in Sask., 4 were suitable for seed, 13 required seed treatment, and 7 (29%) were unfit. It is evident that the seed produced in the Nipawin-Codette area is much inferior to the small group of seed samples from elsewhere in Sask. (G.A. Scott).

Other Observations

LEAF and POD SPOT (Ascochyta Pisi). Infection was slight to moderate in several gardens at Edmonton, Alta., and slight in the plots at Lacombe (M.W.C.). A moderate infection was present on Tall Telephone, making the crop unsuitable for seed at L'Assomption, Que.; a trace was present on other varieties (R.O. Lachance). A 1-2% infection was observed on the pods of Fenland Wonder in a planting in Kings Co., N.S.; the damage was slight (J.F. Hockey). A trace of leaf spot was seen in a planting in Queens Co., P.E.I. (R.R. Hurst).

ANTHRACNOSE (Colletotrichum Pisi). Infection was moderate to heavy on stems and pods of Arthur foundation stock at the Central Experimental Farm, Ottawa, Ont. (R.G. Atkinson).

POWDERY MILDEW (Erysiphe Polygoni) caused a complete crop failure in garden peas in the Stanley area, York Co., N.B. (S.F. Clarkson).

WILT and ROOTROT (Fusarium spp.). Up to 100% of the plants were affected in some places in fields in Essex Co., Ont.; the damage was moderate (J.J. Miller). Fusarium rootrot was recorded in several fields about Guelph, Ont. It was severe in the test plots of the Minnesota Valley Canning Co., near St Marys; so far as it is known peas had not been grown in the fields before (J.D. MacLachlan). Wilt and rootrot was very severe, causing the death of many plants and very low yields, in the plots, Division of Horticulture, C.E.F., Ottawa; infection varied from 30 to 100% in Director, Engress, Kootenay, Laxanney, Laxton Progress, Linton, Onward, Radium, Swonder and Thomes Laxton, less severe in Zipper, 2% in Laxal and trace in Engton (R.G. Atkinson). Infection was severe in Arthur and the crop was nearly a complete loss in some fields at Ste. Anne de la Pocatière, Que. (R.O. Lachance)

BACTERIAL BLIGHT (Pseudomonas Pisi) slightly infected a planting of field peas at Sidney, Man.; it was less severe around the edge of the field (J.E. Machacek).

ROOTROT (Rhizoctonia Solani) caused slight damage in the plots at Lacombe, Alta. (M.W.C.).

LEAF SPOT (Septoria Pisi) was heavy in all Cereal Division plots, C.E.F., Ottawa, Ont. (D.B.O. Savile).

MOSAIC (Pisum virus 2). A trace was found in 2 gardens at the Station, Fredericton, N.B., and in a small field in Sunbury Co. (D.J. MacLeod). A trace occurred in Queens Co., P.E.I. (R.R. Hurst).

CHLOROSIS (lime-induced) was severe in a planting at Stony Mountain, Man. (J.E. Machacek).

INFECTIOUS CHLOROSIS (virus). A slight amount was seen at Vernon and Summerland, B.C. (G.E. Woolliams).

STREAK (Solanum virus 1, N strain). A severe strain of Solanum virus 1 was found in 2 plants, which developed streak in a garden in Sunbury Co., N.B. (D.J. MacLeod).

POTATO

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

Table 3: Seed Potato Certification
Number of Fields and Acres Inspected, 1945.

Province	Number of Fields		Fields Passed	Number of Acres		Acres Passed
	Entered	Passed	%	Entered	Passed	%
P.E.I.	5,812	5,511	94.8	25,473	24,468	96.1
N.S.	265	251	94.7	603	577	95.7
N.B.	2,746	1,751	64.0	18,340	10,951	60.0
Que.	795	585	73.5	1,743	1,104	63.3
Ont.	796	735	92.3	2,270	2,117	93.2
Man.	103	61	59.2	274	178	64.9
Sask.	68	64	94.1	68	58	85.2
Alta.	176	146	82.9	320	251	78.4
B.C.	506	397	78.4	1,555	1,162	74.7
	11,267	9,501	84.3	50,646	40,866	80.7
Previous Yearly Totals						
1944	8,500	7,567	89.0	31,633	28,616	90.4
1943	9,562	5,520	57.7	34,947	19,148	54.8
1942	7,947	5,023	62.2	29,981	18,875	62.9
1941	9,813	6,404	65.3	37,668	24,405	64.8

Acres Entered		Acres Passed	
1944	31,633	1944	28,616
1945	50,646	1945	40,866
Increase of 19,013 or 60.1%		Increase of 12,250 or 42.8%	

Table 4: Seed Potato Certification: Acreage Passed by Varieties, 1945.

Variety	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.-Alta.	B.C.	Total
Green Mountain	8,331	57	3,992	1,023	48	3	44	13,528
Irish Cobbler	12,547	141	340	58	264	107	1	13,458
Katahdin	1,418	227	5,267	10	1,238		15	8,175
Sebago	2,135	92	71		89			2,387
Bliss Triumph		44	1,085			38		1,167
Netted Gem	4				4	244	728	980
Chippewa	2		37	8	356	1	3	407
White Rose							265	265
Warba		10	1		25	15	42	93
Houma	24		62		4		1	91
White Bliss			89					89
Rural New Yorker					50			50
Early Epicure						12	27	39
Other Varieties	7	6	7	5	9	67	36	137
TOTAL	24,468	577	10,951	1,104	2,117	487	1,162	40,866

Table 5: Seed Potato Certification: Fields Rejected on Field Inspection, 1945.

Province	Leaf Roll	Mosaic	Ring Rot		Black Leg	Adjacent diseased Fields	Foreign Varieties	Misc.	Total
			in field	on farm					
P.E.I.	59	30			23	27	62	100	301
N.S.	2				2	1	3	6	14
N.B.	793	2	85	64	2	18	8	23	995
Que.	20	5	69	32	27	12		45	210
Ont.	6	2	4		14	4	2	29	61
Man.	1		19	16	1			5	42
Sask.				2	1		1		4
Alta.	2			11	2	4	5	6	30
B.C.	48	10			4	20	3	24	109
TOTAL	931	49	177	125	76	86	84	238	1,766
Rejections as a percentage of fields:									
Entered	8.2	0.4	1.6	1.1	0.7	0.8	0.8	2.1	16%
Rejected	52.7	2.8	10.0	7.1	4.3	4.9	4.7	13.5	100%

Table 6: Seed Potato Certification: Average Percentage of Disease found in Fields, 1945.

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	.11	.09	.05	.23	.02	.15	.08	.14	.06
Leaf Roll	.32	.17	3.2	.18	.06	.06	.03	.11	.69
Mosaic	.11	.05	.2	.07	.01	.02	.03	.03	.21
Fields passed: (final inspection)									
Black Leg	.02	.04	.03	.07	.03	.04	-	.03	.02
Leaf Roll	.09	.08	.2	.08	.04	.03	.02	.08	.01
Mosaic	.04	.02	.03	.06	-	.01	-	.02	.05

As shown in Table 3, both the number of acres entered for certification and the number passing inspection were high in 1945; in fact, it was the greatest acreage entered since seed certification began. The percentage of acres passing inspection was, however, less than last year, although considerably higher than in recent years, when the fields eligible for certification needed only to be planted with certified seed.

Anyone familiar with seed certification is aware that the presence of mosaic and leaf roll above the amounts tolerated has accounted for upwards half of the rejections; less well known or understood was the continued freedom of some stocks, especially when virus diseases were absent or in extremely low

concentrations. As suggested last year (P.D.S. 24:52), the two factors responsible for the remarkable improvement in percentage of acres passing inspection were the greater freedom of the seed from virus diseases and the low aphid population in 1943.

A study of this year's figures shows a further decline in the rejections on account of mosaic below the low figures of last year. This decline suggests that if the amount of mosaic in the seed is below a minimum value this condition is more important than the aphid population to which the crop is currently exposed. On the other hand the sudden increase of leaf roll in N.B. in 1945, when it was responsible for almost 80% of all rejections as against 18% in 1944, points to rapid spread only accountable by fluctuations in the aphid population from year to year.

As over one-third of the acreage entered for certification is in N.B., the large number of rejections for leaf roll in that province sharply raised the national total for leaf roll rejections. On the other hand, rejections from other causes declined both absolutely and relatively. Bacterial ring rot continues to hold second place in certified seed; it was most serious in Man. where 35 fields out of 103 entered were rejected on account of ring rot occurring in the field or in other fields on the same farm.

COMMON SCAB (Actinomyces scabies) was found on several crops of smooth skin varieties, especially Katahdin, Warba and White Rose grown on the drier soils in the Caribou and the interior of B.C., but the loss from grading out affected tubers was probably about average (H.S. MacLeod). Less scab has been present than usual on smooth skin varieties in Alta. in the last 2 years. However, on bin inspection, 2 lots of Netted Gem grown in northern Alta. showed a high percentage of surface scab, which is uncommon in this variety (J.W. Marritt). The season was apparently favourable for scab in Sask., for several lots were so severely affected that grading would be unprofitable (A. Charlebois). Most crops showed a trace of scab in Man. and northwestern Ont. (D.J. Petty). Scab was slight in a field at Hartney and severe in one of Irish Cobbler at Winnipeg, Man. (W.L. Gordon). The disease was rather prevalent in central Ont., the season being apparently favourable for its development. In general, the crop was planted late under very wet conditions, while in August, temperature was high and rainfall slight or none. Many bushels of excellent Foundation seed could not be graded up to standard due to its presence (J.W. Scannell). Severely affected tubers were received from Sesikinika Lake (L.T. Richardson). Slight scab was present in many lots inspected in Que., but heavier infections than usual occurred in some districts, conditions being apparently more favourable as a result of dry weather during the growing season. Infection varied from 20 to 50% in fields where lime had been applied some time previously. Very scabby lots of table stock were observed on the markets at Quebec, Three Rivers, Shawinigan Falls, Grand' Mère, Joliette and Drummondville (B. Baribeau). No serious infections were reported in N.B. In districts where it is the practice to burn straw piles in the fields, it has been noted that potatoes grown the next year on the burned-over areas are affected with scab (C.H. Godwin). Scab was more common than usual in N.S.; it was found in 45% of the crops inspected and about 5% of the tubers were affected (W.K. McCulloch). Common scab was more or less prevalent in most sections of P.E.I.; some lots were quite severely

infected and were difficult to grade (S.G. Peppin). Scab was so severe in one lot of Green Mountain grown in 1944 that the entire bin was destroyed by secondary rots (R.R. Hurst).

EARLY BLIGHT (Alternaria Solani) was present in 15% of the fields inspected in B.C., infection being usually slight.

It was, however, severe in 2 fields and moderate in 12 (H.S. MacLeod). Infection was slight to moderate in several plantings at Edmonton, Alta. (M.W.C.). Early blight was observed frequently, but it caused no apparent damage in Sask. (A. Charlebois, R.J. Ledingham). Recorded infection of early blight were: severe at Brandon and Carberry, Man., moderate at Darlingford and slight at Lakeland and Swan River (W.L. Gordon). Infection was slight in 25% of the fields in Man., moderate in one field at Brandon and severe in another at Glenbory. Infection was slight in most fields in the Thunder Bay District, Ont., with a moderate infection in the Upsala area. A slight to moderate infection was noted in a few fields in the Oxdrift area in the Kenora district. Several tubers were found affected at Dryden in the same district (D.J. Petty, J.E. Machacek). Some early blight developed at the first of the season in Ont., but infection remained slight (J.W. Scannell). Early blight was general in Que., but caused only slight damage to the crop. It was difficult to estimate because severe damage by flea beetles and leaf hoppers caused premature death of the vines (B. Baribeau). A few fields showed a light infection in York, Carleton and Victoria Co., N.B., late in the season; it was not observed in the coastal counties from Charlotte to Restigouche (C.H. Godwin). Early blight was again fairly common and, together with drought, was responsible for many light crops of Irish Cobbler in N.S.; it was first reported in Colchester Co. on July 23 and in Kings on Aug. 3 (W.K. McCulloch). A moderate epidemic developed on Irish Cobbler in P.E.I. and affected the growth of the plants to some extent (R.R. Hurst).

TUBER ROT (Alternaria Solani). A slight infection was seen here and there on Green Mountain in Que. (B. Baribeau). No tuber rot was noted in the Maritime Provinces (C.H. Godwin, W.K. McCulloch, S.G. Peppin).

BACTERIAL RING ROT (Corynebacterium sepedonicum) was found in 6 commercial fields, and in 4 others where the crop was for home consumption, in the Comox Valley district on Vancouver Island, B.C. It was first found on Oct. 25 in a 2 acre field, where the damage was severe; in the other 9 (about 8 acres), it caused a trace to slight loss. All the fields were planted with table stock which was supplied by one person. The exact source of the infection has not been traced, but it is believed to have come in table stock imported into the province. The disease has not been found in any field entered for certification (W.R. Foster, W. Jones, H.S. MacLeod).

Bacterial ring rot was first discovered in Alta. on 2 farms in 1937. The disease spread rapidly through the commercial potato-growing areas and was threatening the industry by 1940. Although the regulations were successively tightened, the annual survey revealed its presence on 235 farms, involving 1775 acres, in 1940. Damage occurred largely in the southern irrigation districts with scattered cases among the market gardens about Calgary, Medicine Hat and Drumheller. By this time a virtual quarantine was in force. In 1944 it was at last evident that the battle against ring rot was being won. In that year the number of diseased fields was barely higher than the year before and

the intensity of infection was less in the affected fields. In 1944, however, 2 fields were found at Edmonton. In 1945 only 137 fields, or 11.4% of the 1198 inspected, were found affected as against 241 or 23% in 1944. The intensity of infection was also less, averaging under 3%, while less than 20 acres showed over 10% of the plants diseased. The present measure of control has been achieved by: (1) introduction of disease-free seed -- sufficient seed of high quality will be available for the first time in 1946 to replace infected stocks found this year. (2) vigorous enforcement of quarantine regulations, which include regulating the quality of seed planted and the prompt disposal of infected stocks into safe markets, and (3) continued education respecting sanitation and other precautions against infection (J.L. Eaglesham). Ring rot was not found in any fields entered for certification, but it was present on 2 farms on which seed potatoes were being grown (J.W. Marritt).

Bacterial ring rot was reported from about 20 well separated places in Sask.; no cases of severe damage were seen in 1945, but numerous farms revealed a trace (R.J. Ledingham). Ring rot was found after digging in one lot of Columbia Russet entered for certification. This stock had been grown for several years where early frosts are the rule and the final field inspections may have been made too early for ring rot symptoms to appear. Two fields were rejected because ring rot occurred in fields of table stock on the same farm (A. Charlebois).

Ring rot was the major cause of rejection of fields entered for certification in Man. in 1945. It caused the rejection of 46 crops, 35 on field and 11 on bin inspection; a trace was found in 22 crops and it was present on 24 farms in crops of table stock. These latter fields were mostly in the larger table stock producing areas about Winnipeg and Selkirk. Two fields were rejected in the Thunder Bay District, Ont., on account of ring rot in table stock on the same farm (D.J. Petty). Ring rot has also reached serious proportions in table stock in Man. It was first seen in 1938 and has spread rapidly. Surveys made by Dominion Laboratory of Plant Pathology, Winnipeg, showed that in the spring of 1943, 8.3% of the 250 samples submitted by farmers, were infected and in the autumn of the same year 25% of the commercial potato fields around Winnipeg contained at least some diseased plants. In the 1944 crop 36% of the 50 table stock lots examined from Winnipeg stores contained some affected tubers, with 3.3% of the tubers per lot affected. In 1945 all but one of the commercial fields inspected about Winnipeg were diseased. A survey of the retail stores showed that about 10% of the tubers were now affected, and in Dec. 1945 two cases were reported where over a third of the tubers in storage were attacked (H.N. Racicot).

A survey was again conducted in Ont. Inspectors of the Ont. Department of Agriculture submitted to the St. Catharines Laboratory 308 samples of which 259 proved to be affected by the ring rot organism. These figures indicate a considerable reduction over 1944, when 590 samples were submitted and 464 showed positive infection. The most encouraging feature was that not over 8% of the cases were the result of infection on farms where the disease had ever been found before (J.K. Richardson). Out of 796 fields entered for certification, 4 were rejected in the field and one at bin inspection on account of ring rot (J.W. Scannell).

Bacterial ring rot was present in 69 or 8.6% of the fields entered for certification in Que. compared with 15.7% in 1944; there was a similar decrease in fields rejected because the disease occurred on the same farm. In general, ring rot was present in most commercial fields, but the percentage of infection was somewhat lower than last year and very little damage occurred at digging time from tuber rot (B. Baribeau).

A considerable increase occurred in the amount of ring rot in the crop entered for certification in N.B. Field and tuber inspections resulted in rejection of 96 fields amounting to 1004 acres, and an additional 66 fields totalling 397 acres due to ring rot in other fields on the farm. Among the rejected fields were 231 acres planted with infected Bliss Triumph seed from Nebraska (C.H. Godwin). The disease was not found in any crop in N.S.; many plants and tubers were examined at the Kentville Laboratory with negative results (W.K. McCulloch).

As a result of a clean-up campaign carried out by the Seed and Tablestock Inspectors in co-operation with the Provincial Department and the Charlottetown Laboratory almost all farmers in the 2 areas in P.E.I. where ring rot was present in 1944 got rid of their old stock, disinfected their premises, etc., and planted certified seed recommended by the Seed Potato Inspection Service. As a result, not a single case of ring rot was found on any farm, where it occurred previously, and only 3 new cases, all in table stock, were seen despite a very intensive survey in these districts particularly at digging time (S.G. Peppin, R.R. Hurst).

BLACK LEG (Erwinia phytophthora) was found in 61 (12%) fields inspected for certification in B.C.; infection was not over 1% in 54, and it caused the rejection of only 4 fields (H.S. MacLeod). Very severe black leg developed in June in several fields under irrigation near Lethbridge, Alta. Circumstantial evidence indicates that the outbreak was in part due to faulty handling of the seed prior to planting it in cold and wet soil. Black leg was also prevalent in low areas of other irrigated fields at Lethbridge and Brooks, where irrigation water had stood too long (G.B. Sanford). Black leg was present in nearly all fields in the Duchess and Brooks districts planted with local seed but fields that were planted with seed from northern Alta. were very free from black leg except in areas that were flooded. Only a few fields showed a trace in central and northern Alta. Of the fields inspected, 16% were affected and 11 of these were rejected for black leg (J.W. Marritt).

Black leg was fairly common in Sask., but the percentage of affected plants was generally low; in one field 5% of the plants were diseased (R.J. Ledingham). Black leg infection was moderate in 3 fields and slight in one in Man. (J.E. Machacek). In the fields inspected for certification black leg was present in 23 fields out of 132 and caused the rejection of 2 in Man., while the figures for northwestern Ont. were 38 fields out of 78, and 2 rejections (D.J. Petty). Black leg caused the rejection of 12 fields in central Ont.; all the cases were in areas where rainfall was heavy throughout the season (J.W. Scannell). In Que., black leg was virtually confined to the Chicoutimi and Lake St. John districts, where 25 fields out of 178 inspected were rejected (B. Baribeau). Out of 2746 fields inspected only 2 small ones were rejected for black leg in N.B. (C.H. Godwin). Black leg increased five-fold over last year in N.S. Out of 265 fields inspected, 34 were affected

and 2 rejected. A large part of the affected seed came from warehouses where frost had penetrated (W.K. McCulloch). Black leg was fairly prevalent in sections of Kings Co. and there were scattered infections elsewhere in P.E.I.; 23 fields were rejected. Very little black leg is found in fields planted in tuber units as compared with those where the seed has been cut for some time and held over due to adverse weather conditions. In fact many table stock growers now cut and plant the seed immediately in tuber units (S.G. Peppin).

BACTERIAL SOFT ROT (Erwinia ?carotovora) was observed in tubers received from Prescott, Ont., Feb. 5; the tubers showed a soft rot of the pith and infection appeared to have taken place through mechanical or insect injuries (H.N. Racicot). A trace was observed in a lot of Green Mountain in Queens Co., P.E.I., on March 12 (R.R. Hurst).

E.H. Garrard (Can. J. Research C, 23(3): 79-84. 1945) describes a rot present in tubers received Mar. 1944 grown in 1943 in Victory gardens in the Newmarket district, Ont. Isolation, inoculation and re-isolation proved that an organism closely resembling Pseudomonas fluorescens (Flügge) Migula caused active rotting at 5°C, but little or none at all at 25°C and moderate decay at 18°C. It appears to be a wound parasite. It is not suggested that it should be regarded as a separate species. In cooked potatoes rotting was most severe at 25°C.

POTATO ROT NEMATODE (Ditylenchus destructor Thorne). The potato rot nematode (Gerald Thorne. Ditylenchus destructor, n.sp., the potato rot nematode, and Ditylenchus dipsaci (Kühn, 1857) Filipjev, 1936, the teasel nematode (Nematoda: Tylenchidae). Proc. Helminth. Soc. Washington 12(2): 27-34. 1945) was found in Green Mountain potatoes at York, P.E.I., in Nov. 1945 by C.W. Ramsay, Plant Protection Division. Specimens taken to the Laboratory of Plant Pathology, Charlottetown, were forwarded to the Ottawa Laboratory, where the disease was recognized. The identity of the nematode was confirmed by Dr. A.D. Baker, Division of Entomology. The affected tubers were all from one field where the same trouble was alleged to have been noticed by the proprietors in 1942. The nematode was also found in Feb. 1946 in Irish Cobbler potatoes grown at Uigg, P.E.I. In both crops, the percentage of infected tubers was low. Special surveys have been projected to locate additional cases, if any, and experiments to eradicate the pest if at all possible in the cases already discovered (H.N. Racicot).

WILT (Fusarium oxysporum) was found in 98 fields (19%) entered for certification in B.C. and caused the rejection of 4. The pathogen was isolated from wilting plants of Netted Gem and White Rose from Ladner, Lulu Island and North Saanich, and was identified as F. oxysporum f. tuberosi by W.L. Gordon. The disease is quite common in White Rose, usually late in the season (H.S. MacLeod, W. Jones). Small amounts of wilt were present in 36 fields inspected in Man. and 15 in northern Ont. (D.J. Petty). A moderate infection was recorded at Brandon, Man. (J.E. Machacek). One field was rejected on account of wilt in central Ont. (J.W. Scannell). About 15% of the plants were seen to be wilting and dying on one farm in Que. (B. Baribeau).

WILT (Fusarium and Verticillium). A small amount of wilt was seen in 6% of the fields inspected in Alta.; most of them were located in the Brooks district (J.W. Marritt). Severe infections were observed in table stock fields around Indian Head, Regina, Moose Jaw, and Cavalier, Sask. (H. Charlebois). The disease is severe in sandy soil, particularly in dry years; very little seen on the heavier soils (R.J. Ledingham). Low percentages of wilt were reported in fields of Katahdin about Bath and Perth, N.B., and in one field of Green Mountain in Restigouche Co. (C.H. Godwin).

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

STORAGE ROT (Fusarium spp.). Dry rot was common in potatoes in bins on Lulu Island and at Cloverdale, B.C. Isolations from tubers showing stem-end rot were identified as F. Solani by W.L. Gordon (W. Jones). Storage rot caused moderate damage at Duhamel, Alta., F. coeruleum and F. culmorum being isolated (A.W. Henry). Affected tubers were received from Rockglen, Sask. (T.C. Vanterpool). Half the tubers showed infection by dry rot (F. coeruleum) 3 days after harvesting at Macdonald College, Que. (R. Pelletier); the dry rot was probably secondary to late blight rot (I.L.C.). Tuber rot was not extensive in N.B. In one new potato house, which had been insulated but not provided with proper ventilation, damage to both seed and table stock was considerable (C.H. Godwin). Many specimens of storage rot were brought in from various parts of P.E.I.; infection varied from a trace to 10%; it usually follows late blight rot (R.R. Hurst).

PIMPLES (Oospora pustulans). A single affected tuber of Irish Cobbler was received from Queens Co., P.E.I. (R.R. Hurst).

RHIZOCTONIA (Pellicularia filamentosa (Rhizoctonia Solani). Infection was slight in 325 fields, moderate in 103 and severe in 16 out of 506 inspected in B.C.; tuber infection when present was also light in 1945 (H.S. MacLeod). Rhizoctonia caused but slight damage in Alta. and seed tubers were also very free from sclerotia. Only 2 lots harvested late in the season were hard to grade (J.W. Marritt). The disease was unusually destructive to the growing crop early in the season in Sask.; in a plot of Early Ohio at Melfort, plants from sprouted sets were so severely affected that the crop was worthless (A. Charlebois). It was the commonest disease seen in northern Sask., although the damage appeared slight (R.J. Ledingham). In a planting at Swan River, Man., 10% of the hills were affected (W.A.F. Hagborg). Slight infections were observed in most fields in Man. and north-western Ont., and the sclerotia on the tubers after harvest were likewise few (D.J. Petty). Rhizoctonia was unusually prevalent in central Ont. Some lots had to be regraded as the disease appeared to progress in the bin (J.W. Scannell). Rhizoctonia was seen in the field throughout Que., but tuber infection was slight. On bin inspection it appeared to be most abundant in Lake St. John and Chicoutimi districts (B. Baribeau). Rhizoctonia caused little damage to the growing crop in N.B. and sclerotia were not abundant on the tubers, infection averaging about 3% (C.H. Godwin). It was not in evidence in the field in N.S. but tuber infection was about 4%. In 3 fields in which potatoes had been grown in 1944, tuber infection was 17, 20 and 50% (W.K. McCulloch). Very little rhizoctonia was seen in the field in P.E.I., but infection was above average on the tubers, especially on late varieties (S.G. Peppin).

PINK ROT (Phytophthora erythroseptica) was first reported in Canada from B.C. (P.D.S. 23: 43 and W. Jones, Sci. Agric. 25(10): 597-600. 2 pl. 1945). The same or a similar disease has now been recognized in Man. and Que.; unfortunately only the isolates from B.C. have been induced to produce sporangia in culture, but there seems little doubt that some of the Quebec isolates are P. erythroseptica (I.L. Conners, L.T. Richardson). Pink rot was present in several standard varieties of potatoes in wet spots of a field at Winnipeg, Man. on Sept. 28 (J.E. Machacek).

Pink rot was first observed at Ste. Anne de la Pocatière, Que. in Aug. 1942 in the plots of the Plant Protection Division. The disease was again seen in the greenhouse in the winter 1942-43 in tuber-indexed material. Many plants showed a darkening of the stem, petioles and leaves, and some plants were dying when they had reached four inches in height. In the field in 1942 affected plants showed many leaves slightly wilted with little or no discolouration of the stem. When the plants were dug usually at least one or two tubers close to the mother set showed a watery rot resembling the injury caused by frost. The rot commonly appeared first at the stolon end and the lenticels over the dark affected part soon turned dark grey to black. The affected part was somewhat spongy to the touch due to the watery consistency of the rot. When the tubers are cut open the affected flesh is dirty white to grey, or brownish grey.

The disease was seen again in 1943, 1944 and 1945. In Aug. 1945, a wilting and dying of part of the plant was also observed. Some plants failed to show any affected tubers. In the fall when the plots were harvested, 25% of the tubers were destroyed, the infection being worse in low, wet spots in the field; there was a further loss of 5-7% in the first month of storage. The disease has been found in Irish Cobbler, Green Mountain, Beauty of Hebron, Dooley, Sequoia, Katahdin, and Sebago (B. Baribeau).

LATE BLIGHT (Phytophthora infestans) was not as prevalent nor as severe in B.C. in 1945 as in some years, although it was found in many fields near the coast. In some that were not sprayed or dusted sufficiently early or often, it caused quite heavy losses as a tuber rot, especially in a few Green Mountain and White Rose fields in the Fraser River Valley. (H.S. MacLeod). Late blight caused moderate damage in the 1944 crop in storage at Millet and Vermilion, Alta.; it was not observed during the 1945 growing season (M.W.C.).

The weather was favourable for the development of late blight in Man. in 1945 and a severe epidemic was expected. However, an epidemic did not develop because (1) owing to the scarcity of potatoes, almost all the local stocks, containing many infected tubers, were consumed and the majority of fields were planted with uninfected, imported stock, (2) as a result of continued radio and press publicity the growers were ready to begin spraying at the first signs of the disease and (3) although late blight was first observed on Aug. 13, a period of dry weather curtailed its spread until late in the season. Much of the crop was sprayed or dusted in 1945, but the disease was not well controlled because of continued wet weather during September. Consequently in a few areas it caused severe damage particularly in the stored tubers. In general the disease was far less destructive this year than in 1944 (J.E. Machacek). Late blight

infection was in general slight in northwestern Ont., although it was somewhat heavier at Pinewood and in the Slate River Valley (D.J. Petty). Late blight was not very prevalent over most of central Ont. in 1945. Primary infections were numerous, but the disease did not become serious due to hot dry weather and thorough spraying (J.W. Scannell). Late blight reached epidemic proportions for a short period in July in Essex and Kent Counties. Digging operations were stopped for a time until hot weather arrested further spread of the disease (L.W. Koch). Although comparatively few late potatoes are grown in Lincoln Co., late blight was extremely severe in 1945 due to the abnormal precipitation in Sept. It appeared to be fairly well controlled on the vines but tuber rot was severe (J.K. Richardson).

Late blight was first found around Three Rivers, Que., on July 30-31, everywhere along the lower St. Lawrence and in the Gaspé Peninsula except Matane and Rimouski Counties on Aug. 1-3, and in the Chicoutimi and Lake St. John districts on Aug. 7. These are the earliest dates on record in Que. Immediately after the appearance of late blight a period of drought checked further spread. Nevertheless tuber infection occurred throughout the province and ranged from a trace to 5% (B. Baribeau). Although late blight was not noticed in a planting of Green Mountain, at Macdonald College, Que., 60% of the tubers showed blight rot 3 days after the crop was harvested. (R. Pelletier). Late blight was affecting about 1% of the plants of Bliss Triumph and Warba at the Montreal Botanical Garden on July 16; it spread later to all the plants (J.E. Jacques). In the Quebec district, late blight appeared at Beauport and the Island of Orleans about Aug. 1. Little further development was observed and the crop was harvested under satisfactory conditions. However, blight rot developed on the tubers and it was causing some loss at the beginning of winter (O. Caron).

Late blight was not severe in N.B. On account of the very dry summer and fall, the crop matured comparatively early and few viable spores were present to infect tubers at digging time. The severest infection was reported in Houma (C.H. Godwin). Late blight was fairly general in N.S., but infection was slight except in a few fields, in which the spray schedule was not completed. It was first seen in Kings Co. on July 13 and was fairly common by Aug. 24. A slight infection was present on Aug. 14 in Colchester Co. Although it was not noticed in Cumberland Co. until after Aug. 18, it rapidly destroyed the vines soon after. Tuber rot averaged 0.3%, but in Cumberland Co. it was at least 1%. Where modern spraying equipment was used little or no rot occurred (W.K. McCulloch).

Late blight was little in evidence on the vines and caused no defoliation in P.E.I. Irish Cobbler and Sebago escaped almost entirely, but Green Mountain and Katahdin developed some rot 2-3 weeks after digging. A killing frost did not occur previous to harvest and few growers took the precaution to kill the vines the required 2 weeks before digging. Losses were not severe, 2-5% of the tubers being affected (S.G. Peppin). Late blight was first recorded in the field in P.E.I. in Prince Co. on July 14. A severe case was found in cull piles at Hunter River on July 1 and at Montague on July 15 (R.R. Hurst).

Experiments on the control of late blight conducted at Charlottetown, P.E.I. for the past 2 years by L.C. Callbeck reveal that plots sprayed with

low-lime Bordeaux mixtures gave the highest yields and the highest percentages of marketable tubers. Perenox was equal to the high lime Bordeaux, Copper-A was slightly less effective and Dithane and Zerlate, tested only in 1945, gave rather poor control of late blight. In a set of experiments conducted this year under the supervision of G.H. Berkeley and Prof. R.W. Thompson, in Middlesex Co., Ont., plots sprayed with Dithane plus DDT gave the highest yields, while Bordeaux 4-4-40 plus DDT and DDT alone were next 2 highest. Late blight developed only at the close of the season, leaf hoppers being the limiting factor in these plots (I.L.C.).

LEAK (Pythium sp.). A trace was seen at Dauphin, Man. (J.E. Machacek).

STALK ROT (Sclerotinia sclerotiorum) affected a few plants in a field on chocolate loam soil at Cloverdale, B.C. (W. Jones).

SILVER SCURF (Spondylocladium atrovirens) was observed a few times at bin inspection in Que., but infection was very slight (B. Baribeau). Silver scurf, in the sooty stage, was conspicuous on Irish Cobbler, Katahdin, Green Mountain and Sebago in April-May 1945 in N.S. (W.K. McCulloch). One case of a very advanced infection was seen on Green Mountain in Queens Co., P.E.I. on Mar. 12 (R.R. Hurst). A slight infection was observed a few times in fall shipments (S.G. Peppin).

POWDERY SCAB (Spongospora subterranea). Infection was heavy on tubers received from Graham Island in April and it was present on a few tubers from Lulu Island in Nov. (W. Jones). A slight infection was found a few times in B.C. in 1945 (H.S. MacLeod). Slight infections were found occasionally in Témiscouata Co., Que.; the disease was found for the first time in the Chicoutimi district, when a slight infection was recorded in one bin (B. Baribeau). A slight infection was noted in table stock of unknown source on the market in Saint John, N.B. (G.H. Godwin). Powdery scab was found in 2 lots in N.S.; infection was 60% in a lot of Bliss Triumph and 0.8% in one of Katahdin (W.K. McCulloch).

WILT (Verticillium sp.). The organism was isolated from a tuber of White Rose from Abbotsford, B.C. (W. Jones, H.S. MacLeod). Wilt was less prevalent than usual at Edmonton, Alta., fairly common in gardens at Calgary, and quite common in irrigated potato fields in the Lethbridge district, where it has been observed for several years (G.B. Sanford). Several specimens from King and Colchester Co., N.S., collected by the potato inspectors, yielded the organism from the roots (J.F. Hockey). More Verticillium wilt was present in P.E.I. in 1945 than for the past 5 years; it is most frequent in Irish Cobbler and in hot, dry seasons (S.G. Peppin).

CALICO (Solanum virus 10). Two Irish Cobbler plants showing symptoms of calico were found in a field at the Station, Fredericton, N.B. An unidentified potato tuber from Sask. sent by H.N. Racicot gave plants with prominent symptoms of calico. The virus in these potatoes was identified as Solanum virus 10 (D.J. MacLeod). Potato specimens received from Prince Albert, Sask., showed symptoms that corresponded closely with those of calico as reported in the literature (R.J. Ledingham).

LEAF CURL (virus). Five seedlings grown at the Station, Fredericton, N.B., showed a severe curling and puckering of the upper leaves. These leaves were generally reduced in size and sometimes completely reversed, the underside being uppermost. They were also rolled inwards from the margins presenting a cupped appearance. Parts of the laminae were depressed and light green. The affected leaves eventually became chlorotic and died prematurely. Scions from affected plants were grafted to tomato. In 35 days a disease similar to that in the seedlings appeared in the tomato. The identity of the virus has not been established (D.J. MacLeod).

LEAF ROLL (virus) was found in 225 fields out of 508 inspected in B.C. and caused the rejection of 48. Several of these rejections were due to current season infection, especially in the Lower Fraser Valley where the aphid population was high (H.S. MacLeod). High percentages were noted in some commercial crops on the Lower Mainland (W. Jones). Leaf roll was present in 17% of the fields inspected in Alta. and 2 fields were rejected (J.W. Marritt). Only small amounts of leaf roll were seen in fields entered for certification in Sask. (A. Charlebois). Leaf roll rarely occurs in significant amounts in Sask. in commercial fields, where the seed is renewed occasionally by securing certified seed, but is common in home gardens especially in towns and villages (R.J. Ledingham). Leaf roll was present in 16 fields in Man. and 7 in northwestern Ont.; one field in Man. was rejected (D.J. Petty). A severe infection was seen in a field of Bovee at St. Adolphe, Man. (J.E. Machacek). Leaf roll caused the rejection of 6 fields in central Ont. in 1945; Chippewa seems more susceptible than other varieties (J.W. Scannell).

Leaf roll was slightly less prevalent in Que. than in 1944 in fields entered for certification. Only 2.5% of the fields inspected were rejected for it when certified seed was used as compared with 2.8% in 1944. In commercial plantings, especially of President, many fields were seen where 15% of the plants were affected. The yield was only 120 bu. per acre compared with 225 bu. where certified seed was used. Aphids were quite numerous in Sept., and killing frosts did not come until Oct. Accordingly an increase of leaf roll is expected in 1946 (B. Baribeau). Leaf roll was recorded in 2,746 fields and caused the rejection of 793 amounting to 5,925 acres in N.B. All varieties grown for seed were affected. Leaf roll was also prevalent in fields of table stock (C.H. Godwin). Leaf roll (Solanum virus 14) was common in fields of table stock of Katahdin, Green Mountain, and Irish Cobbler in York, Sunbury, Westmorland, Carleton and Victoria Co.; infection ranged from a trace to 22% (D.J. MacLeod). The incidence of leaf roll in N.S. in 1945 was probably the lowest on record; only 2 fields were rejected for certification and no conspicuous cases were seen or reported in table stock fields (W.K. McCulloch). Leaf roll was again relatively light in P.E.I.; 59 fields, approximately 1.0%, of those entered, were rejected for it. It may be noted, however, that one-half of the total rejections occurred in Prince Co., one-third in Queens and one-sixth in Kings. The greatest incidence of leaf roll, therefore, occurred in the sections of P.E.I. nearest to the mainland of N.B. (S.G. Peppin).

MOSAIC (virus) was found in 99 fields and caused the rejection of 10 in B.C.; the disease has been much less prevalent in the past 2 years than for several years previous (H.S. MacLeod). Mosaic, never a problem in Alta., was recorded only in Carter's Early Favorite (J.W. Marritt). Little mosaic

was seen in Sask. in 1945 in comparison with previous years (A. Charlebois). Mosaic is common in city gardens in Sask. and must have an adverse influence on yields; it is not common in farm plantings (R.J. Ledingham). Mosaic was recorded in only 12 fields in Man. and in none in northwestern Ont. (D.J. Petty). Only 2 fields were rejected in central Ont.; aphids, however, were more numerous in 1945 than in previous years (J.W. Scannell). The number of rejections for mosaic in Que. dropped from 35 (3.7%) in 1944 to 5 (0.6%) this year, the lowest figure on record. In commercial fields, mosaic was quite severe, fields with 15% infection being very common. Leaf roll was even more severe (B. Baribeau). Last year (P.D.S. 24: 65) it was predicted that rejections for mosaic would be of the order of 5-10% in fields entered for certification in Que. in 1945. This prediction has not been borne out. It now appears that the greater freedom of foundation and foundation A seed from mosaic is a more important factor than aphid population in controlling the incidence of mosaic in the current crop (I.L.C.). Mosaic caused the rejection of 2 fields totalling 2 acres in 1945 in N.B. as against 5 rejections in 1944. The average infection in all fields inspected for certification was 0.2% in 1945 as compared to 0.1% last year, which seemed to indicate a somewhat more general incidence (C.H. Godwin).

A trace of rugose mosaic (Solanum virus 2) was found in table stock fields of Katahdin, Green Mountain, Irish Cobbler, and Bliss Triumph in York, Sunbury, Carleton, and Victoria Co., N.B. Mild mosaic (Solanum virus 3) ranged from a trace to 3% in table stock fields of Green Mountain in the same counties with a trace in fields of Green Mountain entered for certification. A trace of crinkle mosaic (Solanum viruses 2 and 3) was found in table stock fields of Green Mountain in York, Carleton, and Victoria Co. A trace of mild mosaic (Solanum virus 11) was recorded in table stock fields of Irish Cobbler in York, Sunbury and Carleton Co.; this is the common mild mosaic of Irish Cobbler, a variety immune to Solanum virus 3, which produces a mild mosaic in Green Mountain. Two plants showing leaf rolling mosaic were located in a field of Green Mountain, adjacent to a field of Irish Cobbler showing a trace of mild mosaic, in Sunbury Co. The virus was identified as Solanum virus 11). Three plants of Idaho Russett showing aucuba mosaic were found in a garden at Shediac, Westmorland Co.; the virus was identified as Solanum virus 9.

As in 1944, no fields were rejected for mosaic in N.S. and the percentage of affected plants continued low. The larger growers have the seed tested by the tuber-index method in the greenhouse before planting; this practice appears to have been effective in reducing mosaic (W.K. McCulloch). Only 30 fields comprising 89 acres were rejected on account of mosaic in P.E.I.; it was, as usual, more prevalent in Green Mountain than in any other variety (S.C. Peppin).

NET NECROSIS was found in several crops in B.C. in 1945, but it was not as severe as in some years. To date only a few lots of tubers, chiefly of Netted Gem from the Lower Fraser Valley, have been rejected. (H.S. MacLeod). Some potatoes grown from certified seed on vacant lots in Calgary showed a high percentage of affected tubers; this is believed to be due to infection by leaf roll (J.W. Marritt). Net necrosis was reported in a few lots during bin inspection along the St. Lawrence, Que., but the infection is very slight compared with last year (B. Baribeau). Net

necrosis was severe in Green Mountain in N.B. and resulted in the rejection of a large quantity of seed (C.H. Godwin). Net necrosis was found in N.S. in 18 acres of Irish Cobbler, with 3% of tubers affected (W.K. McCulloch). Six tubers of the 1944 crop affected by net necrosis were each cut in two and planted in 12 pots in the greenhouse at Charlottetown, P.E.I.; all plants developed leaf roll (R.R. Hurst).

PURPLE or BUNCH TOP (virus). In 1944 tubers from a number of plants of Katahdin and Chippewa, grown at the School of Agriculture, Olds, Alta., and showing symptoms like those of purple top, were collected and planted as separate units in the Laboratory plots at Edmonton in 1945. The resulting plants appeared normal. This information is presented here to indicate possible difficulty in identifying accurately so-called purple top (G.B. Sanford). Purple dwarf affected 5% of the fields entered for certification in Alta.; the average infection was less than 1% (J.W. Marritt). Purple top was seen in a fairly large number of fields in Sask., but the percentage of infection was very low compared with 1944 (A. Charlebois). Purple top was observed in both Man. and northwestern Ont., but the percentage of plants affected was much lower than last year (D.J. Petty). Although an increase of purple top was expected in 1945, only an occasional plant was found in fields in central Ont. (J.W. Scannell). Purple top was not as general in N.B. as in recent years; it was chiefly present in Katahdin (C.H. Godwin).

Bunch top was found in N.B. in Katahdin, Irish Cobbler, Sebago, Houma, Chippewa and Green Mountain and also in 17 seedlings. Infection in the standard varieties ranged from a trace to 2%; in them, the virus caused a typical bunch-top effect (purple-dwarf) characterisized by a distortion of the leaves and stems, the formation of aerial tubers, aerial stolons, wilting and general dwarfing of the plant. In Green Mountain the symptoms were generally less severe and the top section of the plant presented a chlorotic rosette effect. In the other varieties, the leaves and stems had a purplish cast. The virus gave rise to a variety of symptoms in the seedlings: in some, it caused only a rolling of the leaves and a dwarfing resembling leaf roll (Solanum virus 14); in others it gave rise to a typical bunch top (purple-dwarf) condition. The coloration commonly associated with the bunch-top disease varied as the natural pigmentation of the seedlings. It was also found that the bunch-top virus sometimes invades only a part of the plant. In many of the tubers from the diseased plants examined only one or two eyes were found to be infected. These infected eyes sometimes failed to germinate or gave rise to small weakened or distorted stalks that often died at a height of three to four inches. In a few cases the diseased eyes produced plants that showed typical bunch-top symptoms. Occasionally the diseased stalks completely recovered from the effect of the virus and developed into a normal plant. The infected sections of tubers usually became very hard after three to four months in storage. A number of these hardened tubers remained intact for two years when maintained under ordinary cellar conditions. Usually the uninfected sections of tubers collapsed long before the infected portions showed any signs of breakdown. Some infected tubers also remained intact under field conditions in the soil for four months. A number of whole tubers used as sets (Katahdin and Sebago), which failed to germinate and remained intact in the soil under field conditions until harvest, were found to be infected with the bunch-top virus. This suppression of germination results in many misses when bunch-top infected tubers are used for seed. The infected sections of the tubers frequently developed spindling sprout.

Seven cases were discovered where the leaf roll virus (Solanum virus 14) was associated with bunch-top virus in potatoes under field conditions. In one Green Mountain plant, the bunch-top virus occurred with the mild mosaic virus (Solanum virus 3). In two plants seen the bunch-top virus was associated with Erwinia phytophthora. It was also twice found in association with Rhizoctonia Solani in Katahdin. The symptoms associated with the combinations of viruses, and the blackleg and rhizoctonia organisms with the bunch-top virus, were generally more extreme than when the diseases occurred singly. In all the cases examined comprising 6 standard varieties and 17 seedlings, the bunch-top virus could not be found in tubers or plants beyond the second generation from the original diseased clones. All attempts to transmit the bunch-top virus by means of the leaf hopper, Macrosteles divisus, were unsuccessful. This suggests that the virus is either an aberrant strain of Callistephus virus 1 or an entirely different virus (D.J. MacLeod).

Purple top, which was found in virtually all fields of Katahdin and Sebago in 1944, was reported in 11 out of 114 fields in the current season. In only one field were 1% of the plants affected (W.K. McCulloch). Purple top was recorded in table stock fields of Irish Cobbler, Green Mountain, and Katahdin in P.E.I. (R.R. Hurst).

SPINDLE TUBER (virus) was seen in several table stock fields in southern Alta.; in one field 10% of the plants were affected (J.W. Marritt). A small amount of spindle tuber was found in fields entered for certification in Man. (D.J. Petty). A mere trace was observed in fields inspected in Ont. (J.W. Scannell). Spindle tuber was reported only in a few fields in Que., and very few affected tubers were noted at bin inspection (B. Baribeau). Definite cases of spindle tuber were noted in a few fields of Katahdin in N.B. (C.H. Godwin). A trace of spindle tuber (Solanum virus 12) was found in Green Mountain and Bliss Triumph table stock fields in York Co.; 2% of the plants were affected in a seedling tested under field conditions for virus resistance (D.J. MacLeod). It was not reported in the field in N.S., but a few off-shape tubers were found when Katahdin and Sebago were being graded (W.K. McCulloch). The disease was recorded a few times in Sebago and Katahdin and very rarely in Green Mountain in P.E.I. (S.G. Peppin).

WITCHES' BROOM (virus) was found in 8% of the fields inspected in B.C.; in 2 fields, over 1% of the plants were affected on first inspection (H.S. MacLeod). Less than 1% of the plants were affected in 2 fields in Alta. (J.W. Marritt). One Green Mountain plant was found in a tuber-index test conducted by Seed Potato Certification Service in N.B. The virus was transmitted to tomato in which it produced the typical symptoms of Solanum virus 12 (D.J. MacLeod). One diseased plant was found in a field of Irish Cobbler table stock in P.E.I. (R.R. Hurst).

YELLOW DWARF (virus). A slight amount was reported in 2 fields in the B.C. Interior (H.S. MacLeod). Affected plants from a row of seedlings were sent in from a test plot at O.A.C., Guelph, Ont., by N.M. Parks (H.N. Racicot).

BLACK HEART (non-parasitic) affected 3 tubers from Queens Co., P.E.I., received Jan. 25, 1945 (R.R. Hurst).

FERTILIZER INJURY. Three sets of Katahdin were received from Alliston, Ont.; in two sets the eyes had been killed by fertilizer, while the third set bore sprouts with abnormally short internodes and showed injury from the fertilizer in addition (H.N. Racicot).

FROST. A frost on Sept. 27 in central and northern Alta. injured all potatoes near the surface, making grading of the crop difficult (J.W. Marritt). As the weather was wet in Ont. during the normal time of digging, many tubers were touched by frost before harvesting was complete. However, after the potatoes were stored for a time, it was possible to grade out the injured tubers (J.W. Scannell). An early frost caused some tuber injury in Restigouche Co., N.B. (C.H. Godwin). Field frost caused a 2% loss in a 30-acre crop of Katahdin in N.S. (W.K. McCulloch).

GIANT HILL (cause unknown) was reported in 209 fields inspected in B.C. and in five over 1% of the plants were affected (H.S. MacLeod). A number of fields in northern Ont. showed a trace of the trouble (J.W. Scannell). Giant hill was noted occasionally in N.B. (C.H. Godwin) and N.S. (W.K. McCulloch). One plant of Giant Hill was found in a field of Irish Cobbler in York Co., N.B.; 2 plants of Green Mountain grafted with scions from the affected plant developed normal foliage and tubers (D.J. MacLeod). A few affected plants of Green Mountain were seen in the Laboratory spray plots, Charlottetown, P.E.I. (R.R. Hurst).

LOW TEMPERATURE INJURY. Tubers stored at Blenheim, Ont., all winter showed injury when received May 28 (H.N. Racicot).

MAGNESIUM DEFICIENCY was recorded by several inspectors in quite a number of fields particularly in Kings and Queens Co., P.E.I. (S.G. Peppin). It was noted that the addition of 1% magnesium to the fertilizer was not sufficient to prevent this trouble in P.E.I. fields. Many growers are in addition applying magnesium sprays (R.R. Hurst).

SEED-PIECE DECAY. Half the sets were affected in a field of Houma and Warba in Queens Co., P.E.I.; the decay was the result of severe chilling and poor aeration in storage (R.R. Hurst).

SPRAIN (cause undetermined) was found in tubers of 2 seedlings sent to the Laboratory for testing; they produced normal plants and tubers (D.J. MacLeod).

STEM-END BROWNING slightly affected one lot in Témiscouata Co., Que. (B. Baribeau). The trouble was reported several times in late fall in Green Mountain in N.B. (C.H. Godwin). Stem-end browning was found in 2 lots of Green Mountain tubers at the Fredericton Station. Three tubers from each lot were analyzed for viruses. Only Solanum viruses 1 and 4 (latent virus) were found (D.J. MacLeod).

SUN SCALD caused slight damage in 2 fields and moderate damage in 4 in Man. (W.L. Gordon).

PUMPKIN

POWDERY MILDEW (Erysiphe Cichoracearum). Infection was general in a planting of Sugar Pie at Lytton, B.C. (G.E. Woolliams).

YELLOWS (virus). A trace was found in a planting at Maugerville, N.B.; the symptoms were identical with those described in P.D.S. 24: 70 (D.J. MacLeod).

RADISH

BLACK POD BLOTCH (Alternaria Raphani) was severe in a field of Cornet, nearly an acre in extent, being grown for seed in Lincoln Co., Ont.; the loss was estimated to be 50% of the crop (J.K. Richardson). An examination of specimens revealed spots on the older pods, stems, and leaves; the upper pods were completely blighted and on some A. Raphani was fruiting. Seed heavily infected with A. Raphani was planted in the greenhouse and in the field at Ottawa, and symptoms were carefully recorded. The pathogen may cause some blighting of the seedlings before or after they emerge. On the cotyledons the lesions are marginal, light brown to black, sometimes ½ to ¾ in. diameter with net-like edge, or the lesions are discrete black dots sometimes circumscribed by a yellow to yellow-green halo. On the hypocotyl the lesions are few to many, black dots, flecks or stripes. Sometimes the hypocotyl is girdled at ground level. On older plants, characteristic black scabby lesions are formed on the swollen hypocotyl or "root" of the red globe varieties. These areas are where the diseased cortex is still attached and usually occur on opposite sides of the root due to the lesion being split longitudinally and separated by the enlargement of the vascular system. The diseased tissue is fissured and flaky in appearance but remains more or less firm and involves only the outer layers of xylem. In the field, the lesions on the leaves were roughly circular to broadly elliptical, azonate, nearly dry to papery, slightly raised at the margin, buff to brownish olive, from under 1 to 10 mm. diameter, sometimes coalescing into large, irregular areas. On the pods the lesions are at first black dots with water-soaked margins. Later they become larger, circular to irregular and may coalesce and involve large areas. Frequently very young pods are killed and rapidly turn dark. Similar lesions, varying greatly in size and abundance, are found on the seed stalks, and the slender upper branches may be girdled and killed (R.G. Atkinson).

BLACK ROOTROT (Aphanomyces Raphani). A heavy infection occurred on Long White Icicle at the Station, Kapuskasing, Ont., but only a trace was present on adjacent red globe varieties (R.G. Atkinson).

DOWNY MILDEW (Peronospora Brassicae) was general on a seed crop of Red Turnip and caused slight damage at Westholme, B.C. (W. Jones). A moderate to heavy pod infection occurred on about 75% of the plants in a small plot of Saxa at the Division of Horticulture, C.E.F., Ottawa, Ont.; some of the more severely affected were ripening prematurely. Many of the young pods were killed or reduced in size. A trace to moderate infection also occurred on nearly every plant of Scarlet Turnip White Tip affecting leaves, stalks, and pods (R.G. Atkinson).

DAMPING OFF (Rhizoctonia Solani). The pathogen was isolated in January from a few seedlings from B.C. seed (I. Mounce).

STERILITY (virus) was found in 3 plants in a garden at the Station, Fredericton, N.B. The disease appears to be similar to that causing sterility in turnip and wild radish (D.J. MacLeod).

LEAF ROLL (virus). Three plants in a garden at the Station, Fredericton, N.B., developed a severe upward rolling and unevenness of the leaves. The apical leaves were the most severely rolled and presented a rosette appearance. Scions from the affected plants were grafted to broccoli. After 30 days the latter showed a definite rolling and unevenness of the top leaves, resembling that in radish. The trouble is therefore considered to be of virus origin (D.J. MacLeod).

RHUBARB

LEAF SPOT (Ascochyta Rhei) caused moderate damage in a garden at Edmonton, Alta. (L.E. Tyner).

GREY MOULD (Botrytis cinerea) caused a wilt of the young central leaves in several clumps being forced at North Kingston, N.S., resulting in a 5% loss of the late crop (J.F. Hockey).

CROWN ROT (cause unknown) was observed at many points in northern Sask. In the Saskatoon area, all plantings were more or less affected, some containing 25% diseased plants (R.J. Ledingham). The trouble is again common in Sask. after being relatively scarce for a few years; enquiries received from Laird and Melfort (T.C. Vanterpool). Some 30-40% of the plants of Macdonald College were affected at Ste. Anne de Bellevue, Que. (R. Pelletier).

SALSIFY

WHITE RUST (Cystopus cubicus) heavily infected the leaves of Sandwich Island at the Botanical Gardens, Montreal, Que. (J.E. Jacques).

SHALLOT

FROST. An examination of bulbs from large fields of shallots at Ste. Angèle, Que., on May 15 revealed injury at the base of every bulb with 75-80% of the roots completely or partially severed from the bulb; the tips of the leaves also showed frost damage. It appeared that the injury was due to heavy frosts, after the snow cover was gone, which had caused the ground to heave (H.N. Racicot).

SPINACH

DOWNY MILDEW (Peronospora Spinaciae) was general in several truck gardens at Marpole, B.C., and caused moderate damage (W. Jones).

SQUASH

COTYLEDON SPOT (Fusarium oxysporum). A Fusarium was isolated from cotyledons of seedlings grown in the greenhouse at Saanichton, B.C.; it was identified as F. oxysporum by W.L. Gordon (I. Mounce).

STORAGE ROT (Rhizopus sp.) caused a loss estimated by the grower at 5% at Waterville, N.S. (J.F. Hockey).

SCLEROTINIA ROT (S. sclerotiorum) affected 12% of squash in a planting in Alta. on black Edmonton loam (G.B. Sanford).

CURLY TOP (Beta virus 1) affected about 1% of the squash vines at Grand Forks, Kelowna, and Summerland, B.C. (G.E. Woolliams).

YELLOWS (virus) was severe on 20% of the plants in a plot at the Station, Fredericton, N.B. All the infected plants bore small improperly formed fruits, which were of no commercial value. The virus was found to be similar to that described as the cause of yellows in pumpkin (P.D.S. 24: 70) (D.J. MacLeod).

SWEET CORN

EAR ROT (Fusarium moniliforme). A trace was observed in a planting at Beaumont, Que. (R.O. Lachance).

BACTERIAL STALK ROT (Phytomonas dissolvens). Infection was moderate in a garden at Edmonton, Alta. (L.E. Tyner).

RUST (Puccinia Sorghi) was moderate in a planting in Lincoln Co., Ont., on Vineland Inbred #3, while no infection was seen on 2 other strains nearby (J.K. Richardson).

SMUT (Ustilago Maydis). Slight infection at Shell Lake, Sask. (H.W.M.). No plantings observed in Lincoln Co., Ont., were free from smut, but the later sowings were least affected (J.K. Richardson). Specimens were brought in from one garden in Queens Co., P.E.I. (R.R. Hurst).

TOBACCO

Dr. L.W. Koch has contributed the account presented below from surveys in the old and new tobacco belts of Ont. and from reports received from Que.

Diseases in the Seedbed

YELLOW PATCH (excessive nutrients) was more prevalent in 1945 in Ont. than last year, particularly in the old tobacco belt. Some cases were definitely due to excessive applications of fertilizer. In numerous instances the seedbeds were mildly affected and quickly recovered, due probably to changes in the weather. Such cases were often indicated only

by a patchy appearance of the bed. It is likely that the unusually low temperatures of early May contributed to the damage from yellow patch.

BLACK ROOTROT (Thielaviopsis basicola) caused some damage in seedbeds of burley and dark tobacco in Kent Co., Ont., but very little either in Essex Co. or in the new tobacco belt. Where this disease developed in permanent seedbeds unsatisfactory steaming at the edge of the bed was usually indicated. Only mild damage resulted from black rootrot in seedbeds in the Que. tobacco-growing districts.

DAMPING-OFF (Pythium sp., Rhizoctonia sp. etc.) was probably the most serious disease in Ont. early in the season. It has been observed that many growers using permanent seedbeds of the A-type are learning to control this disease to some extent by regulating the watering and ventilating. Mild damage from damping-off was experienced in Que. seedbeds.

BLACKLEG (Erwinia aroideae). Several cases were observed or reported in Kent Co., Ont., in cotton-covered seedbeds.

FRENCHING was observed in some seedbeds of flue varieties in the new tobacco belt of Ont. Damage was light.

MUSHROOMS again caused considerable damage in seedbeds of Kent Co. where manure is used in building the beds.

BLUE MOULD (Peronospora tabacina) was epidemic throughout the Ont. tobacco-growing districts close to Lake Erie for the first time in the history of Canadian tobacco growing. In the old tobacco district of Essex and Kent Co., where burley and dark tobacco types comprise most of the tobacco crop and where seedbeds are mostly of either the cotton-covered or sash-covered types, at least 95% of the seedbeds were affected by blue mould. Where glass-covered and cotton-covered beds both occurred on the same farm, almost invariably the cotton-covered bed was affected by blue mould either earlier or more severely than adjacent glass-covered beds. On the other hand, in the new tobacco belt where glass A-beds are invariably used, the initial outbreaks of the disease occurred at about the same time and spread more slowly than in the old belt. Moreover, though the transplanting season ended with the disease having covered the entire area of the new belt, the percentage of affected beds was lower than in the old belt despite the greater concentration of seedbeds. This was probably due to the higher temperatures prevailing in the glass A-beds and to the fact that both temperature and humidity can be controlled to some extent in this type of seedbed.

On the whole the 1945 acreage of burley tobacco in Essex and Kent Co. was somewhat reduced through either outright destruction of seedbeds by blue mould or a postponement of planting due to delayed recovery of infected seedlings. Definite cases of reduction in the acreage of flue tobacco due to blue mould infection were also reported in the old tobacco belt. The effect of the disease on the acreage of flue tobacco in the new belt is unknown.

Diseases in the Field

BLUE MOULD (Peronospora tabacina). As blue mould in North America has been, with few exceptions, almost exclusively a seedling disease it was expected that damage in Ont. would stop immediately the plants were transplanted to the field. However, this year many crops in the old tobacco belt, especially about Duart, Ridgetown and Harrow, showed the disease in the field in the form of large, necrotic spots up to about 1 in. diameter on the lower leaves. On the most severely diseased plants, even the uppermost leaves were affected, though here infection appeared as few to many bright yellow spots, indicating abortive infections that did not reach the fruiting stage.

Damage to tobacco in the field was considerably more extensive and widespread in the new belt than in the old and it was not uncommon for fields up to ten acres in size in certain districts of the new belt to show a high percentage of plants with one or more of their leaves affected in varying degrees by blue mould. Damage here, too, was much more extensive on the lower than on the upper leaves.

BROWN ROOTROT (cause undetermined) was somewhat more prevalent in the old tobacco belt than usual due probably to the high acreage of susceptible burley varieties. The new variety Haronova again appeared to possess some resistance though it is still somewhat uncertain. On experimental laboratory plots this year, the disease was most severe where no commercial fertilizer was added.

BLACK ROOTROT (Thielaviopsis basicola) was probably more severe in the new tobacco belt of Ont. than ever before. This may be accounted for by the low soil temperatures prevailing during the first month after transplanting. In Essex and Kent Co. damage from this disease was apparent only on heavier soils.

MOSAIC (virus) caused mild damage in both the old and new tobacco belts of Ont., where tobacco followed tobacco in the rotation. Both the common tobacco mosaic and cucumber mosaic could be found in many burley tobacco fields during the latter part of the season. In Que. mild damage from mosaic was reported.

STREAK (virus) occurred in mild form in the Erieau district of Kent Co. The disease can always be found in the above-mentioned district though not always in the same degree of severity.

FRENCHING (cause undetermined) was more prevalent than usual in the new tobacco belt of Ont. and cases were also not unusual in fields on the more poorly drained soils of Essex Co.

SORE SHIN (Rhizoctonia Solani) again caused some damage on the lightest soils of Essex Co. on flue-cured varieties. Usually this disease does not show up until after a windstorm which results in the "breaking-over" of affected plants at the ground level where the lesion develops.

ANGULAR LEAF SPOT (Pseudomonas angulata) caused negligible damage this year both in Ont. and Que., due probably to dry weather late in the season.

RING SPOT (virus) occurred on isolated plants in many fields of burley tobacco in the old tobacco belt of Ont. One field was seen in which about 150 plants were affected.

TOMATO

EARLY BLIGHT (Alternaria Solani). A slight infection was seen on 2 varieties at the Farm, Agassiz, B.C. (W. Jones). Infection was slight to moderate in a garden at Edmonton, Alta., and a trace in the plots at Lethbridge (M.W.C.). Early blight was quite general in Lincoln Co., Ont., but appeared to be of little importance (J.K. Richardson). A slight infection was recorded on several varieties at Macdonald College, Que. (R. Pelletier); infection was moderate on Early Chatham causing slight defoliation, and slight on later varieties at Ste. Anne de la Pocatière (R.O. Lachance). A slight infection was seen in 7 gardens in Queens Co., P.E.I. (R.R. Hurst).

NAIL-HEAD SPOT (Alternaria tomato). Infection was severe in a mixed planting at Waterville, N.S., particularly on one variety; the disease apparently started in the seed bed (J.F. Hockey).

GREY MOULD (Botrytis cinerea) destroyed up to 5% of the plants in poorly ventilated greenhouses in Essex Co., Ont. in Nov. 1945 (L.W. Koch).

LEAF MOULD (Cladosporium fulvum) was general and caused severe damage in 2 greenhouses at Marpole, B.C. A slight infection was noted on V-121, hitherto resistant, in a greenhouse at Victoria (W. Jones, W.R. Foster). Leaf mould was more severe in Essex Co., Ont., in Nov. 1945 than at any time since V-121 has been grown; greenhouse management affected the incidence of the disease to some extent (L.W. Koch). A rather severe outbreak occurred on a winter crop of Grand Rapids being grown at the Laboratory in early Dec. (J.K. Richardson). A moderate infection was seen, particularly on the lower leaves, of a plot of staked plants at St. Aubert, Que., on Sept. 16 (I.L. Conners).

ANTHRACNOSE (Colletotrichum phomoides) caused the rot of odd fruits both locally grown and imported at Winnipeg, Man.; spores 12.5-17.5 x 3.5-5 microns. The disease was not previously observed on the local crop (W.L. Gordon). Anthracnose caused the loss of 20% of the fruit of Bounty at Macdonald College, Que. It occurred on ripe fruits on the vine and on others ripening in baskets held in storage (R. Pelletier).

BACTERIAL CANKER (Corynebacterium michiganense) caused a trace to slight damage in greenhouses in Sask., and it was reported once or twice from farm gardens in 1944 and 1945 (R.J. Ledingham). The disease severely infected two 2-acre fields and two gardens at Marieville, Que. and 20-25% of the plants were killed by July 24; all the plants were from the same seed source (E. Lavallée). Canker also caused slight to moderate damage at the Montreal Botanical Garden (J.E. Jacques).

FUSARIUM WILT (F. Lycopersici). A field experiment in Essex Co., Ont., revealed that Fusarium wilt may be present without the symptoms being conspicuous. Losses due to decreased yields may, therefore occur without the

grower being aware of the cause. Specimens were received from one field of early tomatoes and the pathogen was isolated (J.J. Miller). Affected specimens were received from Colborne and Almonte, Ont. (L.T. Richardson).

ROOT KNOT (Heterodera marioni). Affected specimens were received from Toronto, Ont. (L.T. Richardson).

LATE BLIGHT (Phytophthora infestans). Infection was moderate on the fruit although light on the foliage at Dauphin, Man. The disease also affected a few green fruits in the plots at Winnipeg and was present on green fruit in storage at Gimli (J.E. Machacek). Late blight was reported to have caused severe damage (up to 80%) in two localities in Essex Co., Ont. (L.W. Koch, J.J. Miller). A loss of more than 50% of the crop was reported from one field of 300 plants in Russell Co., Ont. (H.N. Racicot, L.T. Richardson). Traces of late blight were found in a few fields at St. Martin, Laval Co., Que. (E. Lavallée). Late blight was very common on unsprayed tomatoes about Quebec City, but it was kept under control without difficulty where the vines had received the recommended treatments (O. Caron). A slight to moderate infection occurred on green fruit a week after they were brought indoors to mature at Ste. Anne de la Pocatière from an unsprayed plot; the loss was 30% (R.O. Lachance). Late blight occurred throughout N.B., but was less important than usual except in late-planted tomatoes. In preliminary experiments Dithane, applied as a spray, gave promising control (J.L. Howatt). Little or no damage from late blight occurred until late Sept. in N.S., when the loss became severe in green fruits ripening in storage sheds in Kings Co. (J.F. Hockey). A slight outbreak occurred in a greenhouse in April in P.E.I. but late blight was not observed in the field or garden in 1945 (R.R. Hurst).

BACTERIAL SPECK (Pseudomonas tomato) was severe on green fruit in a planting at Reston, Man.; infection was a trace only and not general at Morden (W.L. Gordon).

DAMPING-OFF (Pythium, Rhizoctonia, etc.) caused moderate damage in the early crop in Essex Co., Ont., the amount depending largely on the greenhouse management. In the outside beds of the late crop, destined for canning, damage was much lighter than usual (L.W. Koch). Damping-off caused the loss of half of 2000 plants in a hot bed in Lincoln Co.; cool weather and lack of sunshine contributed to the heavy loss (G.C. Chamberlain).

LEAF SPOT (Septoria Lycopersici) caused severe damage to the field crop in Essex Co., Ont., due to many of the plantings becoming severely defoliated with resultant shortening of the crop. It became severe in the field in June, earlier than usual because many of the seedlings showed infection before being transplanted. In turn this gave rise to severe local epidemics. The disease developed considerably later in sprayed than in unsprayed crops (L.W. Koch). Leaf spot was widespread about Colborne where it caused a moderate defoliation of the crop especially in plantings made before June 15-20. Nye State and Penn Hart appeared to be most susceptible, Rutgers and John Baer moderately susceptible, and Camdown resistant. A rather severe outbreak was also observed at Aldershot (G.C. Chamberlain). Although leaf spot was quite prevalent in Lincoln Co., it caused little concern (J.K. Richardson). Leaf spot was very heavy in one garden and

slight to moderate in several others near Ottawa, Ont. in August (D.B.O. Savile). Most fields were at least half defoliated at St. Martin, Laval Co., Que., at the beginning of September (E. Lavallée, R. Desmarteau). Similar observations were made at Macdonald College but not until mid-September (R. Pelletier).

WILT (Verticillium albo-atrum) was found in commercial greenhouse plantings in May at Vernon, B.C. (G.E. Woolliams).

BACTERIAL SPOT (Xanthomonas vesicatoria). A moderate to severe infection occurred on the fruit of several varieties at Lacombe, Alta. A bacterium resembling X. vesicatoria was isolated (M.W. Cormack). Some fruits severely affected by bacterial spot were seen in Essex Co., Ont., in Sept. (J.J. Miller).

MOSAIC (virus). All the plants were affected by mosaic in one large greenhouse at Victoria, B.C. (W.R. Foster). An inspection of a planting of tomatoes being grown for seed in Ont. revealed the following percentages of plants affected by mosaic: Stokesdale #4, 20%, plants severely stunted; Bounty 3.3%; Stokesdale 2.5%; Scarlet Dawn 2.1%; John Baer 1.5%; Rutgers trace; Best of All none (G.C. Chamberlain). In a field that had been in cucumbers in 1944, quite a number of John Baer plants developed mosaic of the shoe-string type (J.K. Richardson). An occasional diseased plant was seen in 3 plantings in Queens Co., P.E.I. (R.R. Hurst).

PURPLE TOP (virus) affected 6 plants in a plot at the Station, Fredericton, N.B. Scions from 2 of the plants were grafted to healthy tomato; a disease similar to that described in P.D.S. 23: 77 was produced (D.J. MacLeod).

STREAK (virus) due to mixture of Nicotiana virus 1 and Cucumis virus 1 in the fall greenhouse crops in Essex Co., Ont., shortened the picking period in Nov. 1945 to a considerable extent. Field tomatoes and cucumbers adjacent to the greenhouses appear to have been the source of the infection (L.W. Koch). The disease was seen at Ottawa East in July (L.T. Richardson).

YELLOW TOP (virus). Three plants showed a marked yellowing and dwarfing of the top leaves in a garden at the Station, Fredericton, N.B. A few axillary shoots also appeared in the middle or top axils of the affected plants. When scions from the affected plants were grafted to healthy tomatoes, a disease somewhat resembling witches' broom was produced (D.J. MacLeod).

BLOSSOM-END ROT (non-parasitic) was severe on Stemless Pennorange and Stemless Pennred, moderate, especially on the early fruit on Bonnie Best, and slight on Sioux Stokesdale, Sugawara and Early Chatham, at the Station, Saanichton, B.C.; a slight infection also occurred in local gardens (W. Jones, R. Adamson). Affected specimens were received from Dawson, Yukon, with the comment that it was very severe on Break O'Day; severe on Bonnie Best, Abel, Earliana, Marhis; slight on Grand Rapids and none on Marglobe (H.N. Racicot). Damage from blossom-end rot was much less on Bounty in the field in Essex Co., Ont., than in 1944. However, damage was considerable early in the fall on Vetomold 121 where heavy applications of manure were made or where the

plants were allowed to dry out; usually only the bottom sets were affected (L.W. Koch). Blossom-end rot affected one field at Laval des Rapides, Que. The plants were very close together and the under foliage damp (R. Desmarteau). The trouble was quite destructive in greenhouse tomatoes in Queens Co., P.E.I.; it also caused severe injury in field and garden, judging from the many reports and enquiries received (R.R. Hurst).

BLOTCHY RIPENING (non-parasitic) was severe in one greenhouse at Gordon Head, B.C. (W.R. Foster).

TURNIP

SCAB (Actinomyces scabies). A trace was observed on Laurentian at L'Islet, Que. (R.O. Lachance). Scab was severe in one field of Laurentian at New Perth, P.E.I. (E.B. McLaren).

GREY LEAF SPOT (Alternaria Brassicae). A slight infection was present on May 2 on the foliage of seed plants of several varieties at Saanichton, B.C. A slight infection was also recorded on the lower leaves and some pods in a seed crop of Canadian Gem at Milner (W. Jones).

GREY MOULD (Botrytis cinerea) was general on seed plants of Shogoin at Saanichton, B.C., as a leaf spot and die-back of the stems; the damage was rather severe (W. Jones).

DOWNY MILDEW (Peronospora Brassicae) caused 80% infection on the foliage of a Laurentian seed crop at Baxter's Harbour, N.S.; the damage was slight as the pods were already well formed. The fungus has been provisionally identified as P. Brassicae although the spores are considerably larger than the dimensions given in published descriptions and of the Peronospora on B. arvensis (J.F. Hockey, D.B.O. Savile).

BLACK LEG (Phoma lingam) was found affecting a few roots of Ditmars in one field only in Digby Co., N.S., (J.F. Hockey). Traces of black leg were found in one field on Sept. 27. However, the disease was reported from all 3 counties of P.E.I. Although affected roots may be only slightly damaged when placed in storage, they will eventually rot completely (R.R. Hurst).

CLUB ROOT (Plasmodiophora Brassicae). Several diseased specimens were brought in by a farmer, who reported the disease was causing heavy losses in his field at Rivière des Prairies, Que. (J.E. Jacques). Diseased specimens of Laurentian were brought in from a field in L'Islet Co. (R.O. Lachance). Clubroot affected 39% of the Laurentian roots in a field in Queens Co., P.E.I. This destructive disease is common on many farms (R.R. Hurst).

SCLEROTINIA ROT (S. sclerotiorum) was found attacking swede turnips in storage at Saskatoon, Sask. (R.J. Ledingham).

BLACK ROT (Xanthomonas campestris), as a leaf spot, caused a slight to moderate infection of all the plants in some areas and of 10-30% in the rest of a planting of Acadia grown for stecklings in the plots of the Division of Forage Crops, C.E.F., Ottawa, Ont. (R.G. Atkinson). Traces were observed in only one field of Laurentian in Queens Co., P.E.I. (R.R. Hurst).

STERILITY (virus). A trace was found in a seed plot at the Station, Fredericton, N.B.; 2-3% of the plants were affected in 4 plots examined in York Co. The same virus was found in broccoli, radish and wild radish (D.J. MacLeod). One field of Laurentian in N.S. showed 2% infection and a second 6% (J.F. Hockey).

ROOT NODULES (?virus). Numerous nodules were found on the main and secondary roots of 6 swedes and 2 turnips in a variety test at the Station, Fredericton, N.B. The nodular condition somewhat resembled clubroot, but no Plasmodiophora Brassicae could be demonstrated. Four of the affected swedes were removed to the greenhouse on Oct. 1. When they reached 6-8 in. in height the petioles were approach grafted to healthy swedes. In 106 days 2 of the swedes showed evidence of nodules on the secondary roots. No organism could be found in the nodules (D.J. MacLeod).

BROWN HEART (boron deficiency) was not in general as severe throughout the turnip districts of western Ont. as in 1944. It was, however, severe in localized areas especially among early turnips. Spraying is being generally adopted where equipment is available; the technique of mixing the borax spray has been improved and simplified. Dusting with borax gave such good results in 1944 that it was recommended as an alternative to spraying in 1945 (J.D. MacLachlan). Brown heart was severe in most fields where borax was not applied in York and Sunbury Co., N.B. Some farmers claim to have controlled the disease in fields of an acre or less by the application of 20-30 tons of manure per acre. It is estimated that about two-thirds of the 9300 acres in turnips are now planted on soil receiving a dressing of borax (D.J. MacLeod).

WITCHES' BROOM (cause undetermined). A severe witches' broom condition was found affecting 1% of the plants in a turnip seed plot in York Co., N.B. The plants developed a number of spindly axillary shoots with dwarfed leaves and flowers, and had a very bushy appearance. Most of the pods on the affected shoots were sterile (D.J. MacLeod).

VEGETABLE MARROW

LEAF SPOT (Alternaria sp.). Infection was general and damage considerable in oriental truck gardens at Marpole, B.C. (W. Jones).

POWDERY MILDEW (Erysiphe Cichoracearum) was general, but caused little damage at Brentwood, B.C. (W. Jones). Powdery mildew was general on White Bush vegetable marrow, but it was not observed on nearby Acorn squash and cucumber in a home garden at Summerland, B.C. (G.E. Woolliams).