III. DISEASES OF VEGETABLE AND FIELD CROPS

ASPARAGUS

RUST - Puccinia Asparagi DC.

Sask.- A heavy telial infection of rust was present on a few rows in the University garden, Saskatoon. The damage was slight.

Ont.- Rust was heavy on two-year-old plants in a garden in York county. The stems were severely rusted. A slight general infection was observed earlier in Lincoln county.

P.E.I.- A trace of rust was found in Queens county.

BEAN

MOSAIC - Virus

B.C.- All varieties of beans, including lima, soy, pole, and wax beans, under test at the Experimental Station, Summerland, were affected with mosaic, infection being 100 per cent in most varieties. Infections varying from 5 to 6 per cent were found in several fields in Yale county.

Alta.- Mosaic occurred in the experimental plots at Olds and Lacombe and in gardens at and near Edmonton. The damage usually varied from a trace to light.

Man.- Mosaic was severe in one garden examined.

Ont.- One to two per cent of the plants were affected with mosaic in a field in Lincoln county.

Que.- At Macdonald College, mosaic varied from a trace to 30 per cent according to the variety. It caused moderate damage in some varieties. Roger's Stringless Green Pod showed the highest infection.

N.B.- Two per cent of mosaic was present in the rod rows at the Experimental Station, Fredericton.

P.E.I.- Mosaic is present each year on the Island. Two per cent of mosaic was observed in a garden in Queens county.

ANTHRACNOSE - Colletotrichum Lindemuthianum (Sacc. & Magn.) Bri. & Cav.

B.C.- Anthracnose was severe at Courtenay.

Alta.- Light infections of anthracnose were noted at Edmonton and Lacombe.

Ont.- The crop was practically free from anthracnose in Wellington county. Not over 3 per cent of the plants were affected in any field.

Que.- A light infection of anthracnose was reported from two fields in Kamouraska county.

N.B.- Eighty per cent of the seed in a sample submitted for examination showed anthracnose lesions. The disease was fairly common, but the damage was slight.

N.S.- Seventy per cent of the crop was destroyed by anthracnose in Caledonia Tp., Queens Co. The crop yield was estimated originally as equivalent to 10,000 cases of canned string beans.

P.E.I.- Anthracnose caused moderate damage in gardens this year.

BACTERIAL BLIGHT - Pseudomonas Phaseoli E.F.Sm.

Alta.- Bacterial blight was a very common disease of beans in zones 9 and 10. Severe damage was reported from Brooks; some damage also occurred at Edmonton and elsewhere.

Sask.- Bacterial blight was reported only at Rosthern in the experimental garden. The varieties showed marked differences in susceptibility; The Prince, and Princess of Artois, 25 per cent infection; Early Red Valentine, 50; Full Measure, and Refugee, 66; Stringless Green Pod, 75; Masterpiece, 100.

Que.- Infection by bacterial blight varied from slight to 100 per cent according to the variety in the test plot at Macdonald College. The damage was severe where the infection was heavy. Stringless Green Pod was one of the most heavily infected. A slight infection was also present at the Experimental Farm, Ste. Anne de la Pocatière and in Missisquoi county.

N.S.- Bacterial blight caused severe leaf infection in only a few spots in fields in Caledonia Tp., Queens Co. The damage was very slight.

P.E.I.- A slight infection of bacterial blight was found in one garden in Queens county.

STEM ROT - Rhizoctonia sp.
Alta.- Stem rot was common and often severe on seedlings in Edmonton gardens.

WILT - Sclerotinia Sclerotiorum (Lib.) de Bary
Alta.- Wilt caused severe damage in three gardens at Edmonton. All parts of the plant were attacked.

RUST - Uromyces appendiculatus (Pers.) Lév.
N.S.- Traces of rust were found on several varieties at Kentville.

LEAF SPOT - Phyllosticta phaseolina Sacc.
B.C.- This leaf spot was general on Vancouver island. The damage was slight.

BROAD BEAN

STEM and POD CANKER - Sclerotinia Sclerotiorum (Lib.) de Bary
Alta.- Stalks and pods were found affected with a black, dry rot at Edmonton. Sclerotinia Sclerotiorum was isolated from the lesions.

BEET

BLACK LEG - Phoma Betae (Oud.) Frank
B.C.- Black leg was general on Vancouver island and in the lower Fraser valley. The damage was severe in isolated places.

Alta.- Black leg was observed in several gardens at Edmonton and at the Experimental Station, Lacombe.

P.E.I.- This disease caused slight damage in Queens county.

SCAB - Actinomyces scabies (Thaxt.) Güssow
Alta.- Moderate infections of scab were found in gardens at Edmonton.

Que.- Severe infections of scab were reported on beets planted in infected soil at Pont Rouge and St. Raymond.

N.B.- Scab caused a slight infection in a garden patch in Victoria county.

P.E.I.- A slight infection of scab was present in one garden in Queens county.

SEEDLING BLIGHT - Fusarium sp.
B.C.- The disease was general on Vancouver island and in the lower Fraser valley.

DAMPING OFF and ROOT ROT - Pythium de Baryanum Hesse
B.C.- Damping off was general on Vancouver island. The damage was severe in some places.

CABBAGE

CLUB ROOT - Plasmodiophora Brassicae Woron.
B.C.- Club root was serious on Vancouver island. The disease was also destructive on Danish Ballhead at Armstrong. Infection varied from 70 to 100 per cent; the damage was severe in some fields and the crop was a total loss in others.

Que.- Club root destroyed 80 to 85 per cent of the crop in two fields, whose area was 1/3 and one acre respectively, in Laval county. The smaller field was planted with Chinese cabbage.

N.B.- The disease was general throughout the province. Two per cent of the plants were affected at the Experimental Station, Fredericton.

P.E.I.- Only a trace of club root was recorded in the field. Seedlings of Copenhagen Market affected with the disease, were received from Summerside. The disease was not important this year.

BLACK ROT - Pseudomonas campestris (Pamm.) E.F.Sm.
Que.- Fifteen per cent of the plants were affected with black rot in one field in L'Islet county.

P.E.I.- A trace of black rot was found in a garden in Queens county.

SOFT ROT - Bacillus carotovorus L.R. Jones
B.C.- Soft rot was widespread, but the damage was slight.

N.S.- Five per cent of the heads were destroyed by soft rot in a field of Danish Ballhead in Kings county. It was thought that the disease was more prevalent on account of the extremely wet weather experienced locally.

LEAF SPOT - Alternaria circinans (Berk. & Curt.) Bolle
(=A. Brassicae Sacc. not Macrosporium Brassicae Berk.)

B.C.- Alternaria leaf spot was general on Vancouver island, but the damage was slight.

P.E.I.- Traces of this leaf spot occurred in a garden in Queens county.

STEM ROT - Rhizoctonia sp.

Que.- Stem rot caused by Rhizoctonia sp. was observed on 5 per cent of the plants in a field in L'Islet county.

YELLOWS - Fusarium conglutinans Woll.

Ont.- Three per cent of the plants were affected with yellows in a low part of a planting in Lincoln county.

BLACK LEG - Phoma Lingam (Tode) Desm.

N.B.- Black leg affected 100 per cent of the plants in a small garden in York county.

WHITE RUST - Cystopus candidus (Pers.) de Bary

B.C.- White rust is rare on Vancouver island.

BACTERIAL LEAF SPOT - Pseudomonas maculicola (McCull.) Stev.

Ont.- A few leaves of a cabbage showing the typical symptoms of bacterial leaf spot were sent to the Laboratory for identification. The correspondent reported that the disease "seems to be all through right to the inner leaves. In some places in the cabbage it was hardly seen and in other places it is very dense". Where the cabbage was grown was not stated.

CANTALOUPE

INTERNAL BREAKDOWN - Non-parasitic

B.C.- Internal breakdown was found in the three varieties being grown commercially: Hales Best, Hearts of Gold, and Superfecto. This premature breakdown has become so serious in the last two years that it has attracted a great deal of attention among both growers and shippers. Some shippers are of the opinion that if the disease continues to be as prevalent as it is at the present time, cantaloupes cannot be considered as a suitable crop for the southern part of the Okanagan valley.

MOSAIC - Virus

Ont.- Only an occasional plant affected with mosaic was found in a field in Welland county.

CARROT

SCLEROTINIA ROT - Sclerotinia Sclerotiorum (Lib.) de Bary

Alta.- Sclerotinia rot frequently caused moderate to severe losses in storage in the Edmonton district. In one field 75 per cent of a heavy crop was diseased, 50 per cent of which was unfit for harvest. In addition, 25 per cent of the harvested crop is rotting in storage in spite of treatment with standard formalin solution for four hours.

Que.- Eighty per cent of the crop was affected with Sclerotinia rot in a cellar at Ste. Anne de la Pocatière on Oct. 30. The cellar was very damp and poorly ventilated.

CAULIFLOWER

CLUB ROOT - Plasmodiophora Brassicae Woron.

Que.- Club root destroyed 80 to 85 per cent of the crop in a field of 2/3 acre in Laval county.

P.E.I.- One per cent of the plants were infected and destroyed by club root in a field in Queens county.

WHITE RUT - Cystopus candidus (Pers.) de Bary

Alta.- White rust was reported from Elnora.

SOFT ROT - Bacillus carotovorus L.R. Jones

B.C.- A slight amount of soft rot was present on Vancouver island.

CELERY

LATE BLIGHT - Septoria Apii Chester

B.C.- Late blight was general on Vancouver island and caused moderate damage.

Ont.- Late blight was prevalent on all varieties in Lincoln county. It was more severe this year than for some time past; the damage was moderate to severe, many growers suffering considerable financial loss. In some of these fields the causal

organism was reported as S. Apii var. graveolentis Dorogin.
Late blight caused moderate damage in Norfolk county.

Que.- Late blight was moderate to severe in the plots at Ste. Anne de la Pocatière, while it caused severe damage at St. Martin. Material was collected for microscopic examination. In the Ste. Anne collection the pycnidia were borne on the leaf blades, in well defined spots with usually a paler centre. The petioles appeared to be free from infection. The spores measured 17-30x1.5-3u. with 1 to 3 septa. The causal organism was identified as Septoria Apii Chester (Bull. Torr. Bot. Club 18: 373. 1891) although he gives the spore size as 25-40 x 2-2.5u.

In the St. Martin collection the spots were of two types: one typical of S. Apii and a second similar to that reported recently by Cochran (Two Septorias as a cause of late blight on celery. Abstr. Phytopath. 21:115. 1931) in the United States and caused, according to him, by S. Apii var. graveonlentis Dorogin. The latter spot is very indefinite, irregular, brown, shading imperceptibly into the leaf. On some leaves where the healthy tissue was turning yellow the affected portions were still a deep green. The pycnidia were numerous on these spots. In addition lesions bearing pycnidia were present on the petioles. Spore measurements were: S. Apii 22.5-45 x 2-2.5u, with 1 to 4 septa; S. Apii var. graveolentis, 33-54 x 2-3u, with 1 to 3 septa. If infection studies with pure cultures prove the correctness of Cochran's assertions, these two fungi occur in Canada (H.N. Racicot & A. S. Hill).

N.B.- Late blight was common in York county, but the damage was slight.

P.E.I.- This disease was reported from several gardens in Queens county. Traces of the disease were present on several varieties at Charlottetown.

YELLOWS - Fusarium sp.

B.C.- Twenty-five to 50 per cent of the plants were affected in a field of Golden Plume at Armstrong. The affected plants were worthless.

BLACK HEART - Cause unknown

Ont.- Slight infections of black heart occurred in early varieties in Lincoln county. This disease was more prevalent than last year. Paris Golden is the most seriously affected of all varieties, although the others become diseased to some extent. The disease is most severe in plants which are set out early.

SOFT ROT - Bacillus carotovorus L.R. Jones
B.C.- A small amount of soft rot occurred on Vancouver island.

Ont.- One half of one per cent of the plants were affected with soft rot in a field in Lincoln county.

CUCUMBER

SCAB - Cladosporium cucumerinum Ell. & Arth.
Que.- A trace to a slight amount of scab occurred on the crop, which had been left unharvested in three fields, two in Laval county and one in Sherbrooke. It caused, therefore, no financial loss.

N.B.- Scab was common throughout the province. In one field 80 per cent of the fruit was infected and the damage was severe.

BACTERIAL WILT - Bacillus tracheiphilus E.F.Sm.
Ont.- Bacterial wilt was found on several farms in Lincoln county. In one field 3 per cent of the plants were infected.

MOSAIC - Virus
Man.- Mosaic was not common in 1931 at Winnipeg.

Ont.- One per cent of the plants were diseased in a field in Lincoln county.

P.E.I.- Traces of mosaic were found in several gardens in Queens county.

ANGULAR LEAF SPOT - Pseudomonas lachrymans (Sm. & Bryan) Carsner
N.B.- Angular leaf spot caused severe damage on the plots at the Experimental Farm, Fredericton.

EGG PLANT

WILT - Verticillium sp.
Ont.- Ten per cent of the plants were affected with wilt on July 29 in a three acre patch of New York Purple in Welland county;

about two per cent of the infected plants had entirely wilted and the remainder showed signs of the disease.

EARLY BLIGHT - Alternaria sp.
Que.- This disease was common on the lower leaves in a planting at Ste. Dorothée. Although the spots were typical of early blight it was found that the spores were too small for Alternaria Solani and that they corresponded more closely to those of A. fasciculata, being even a little small for the latter species. The spores measured 9-16.5 x 37.5-67u.

GINSENG

STEM ROT - Corticium Solani (Prill. & Del.) Bourd. & Galz. (Rhizoctonia Solani Kühn)
B.C.- Stem rot was general on Vancouver island; the damage was severe.

DAMPING-OFF - Cause undetermined
Ont.- Three to 5 per cent of the plants were destroyed by damping-off in a 1/4 acre field of seedling ginseng.

HOP

DOWNY MILDEW - Pseudoperonospora Humuli (Miyabe & Tak.) Wilson
B.C.- Downy mildew was general in the lower Fraser valley. The damage was severe.

JERUSALEM ARTICHOKE

SCLEROTINIA ROT - Sclerotinia Sclerotiorum (Lib.) de Bary
B.C.- Sclerotinia rot was rare on Vancouver island. The damage was slight.

LETTUCE

DROP - Sclerotinia Sclerotiorum (Lib.) de Bary
Que.- A trace of lettuce drop was present in Kamouraska county.

DOWNY MILDEW - Bremia Lactucae Regel
B.C.- Downy mildew was found in one field at Victoria. The damage was severe.

RHIZOCTONIA - Corticium Solani (Prill. & Del.) Bourd. & Galz. (Rhizoctonia Solani Kühn)

Alta.- Rhizoctonia apparently rotted entire rows of head lettuce in a garden at Edmonton. The damage was severe also in the experimental plots at Lacombe.

ROOT ROT - Botrytis sp.

Ont.- Root rot destroyed 15 per cent of the plants in a plot of early lettuce transplanted from plots in the greenhouse to the field. Infection apparently originated from the greenhouse soil, which was transferred to the field with the plants. Isolations made from the diseased roots yielded a Botrytis.

MUSHROOM

BUBBLES - Mycogone perniciosa Magn.

Sask.- One crop was completely destroyed by bubbles disease in a commercial mushroom house at Saskatoon. The loss probably amounted to several hundred dollars. The causal fungus was not definitely determined, but the symptoms were characteristic of the disease (P.M. Simmonds).

Ont.- Bubbles disease was destructive in the mushroom houses of one commercial grower in Toronto.

ONION

NECK ROT - Botrytis Allii Munn

Man.- Specimens showing neck rot were received from Winnipeg. Although the symptoms were not typical for Botrytis Allii, cultures of the sclerotia yielded only this species.

BULB ROT - Fusarium sp.

B.C.- One to two per cent of the plants were found affected with bulb rot in a field of Danvers Yellow Globe at Kelowna, as early as June 9. Onions were not grown on this land in the previous three years. Before that time the land was cropped to onions continuously and considerable rot was present. A small amount of bulb rot was present on Vancouver island.

MOSAIC - Virus

B.C.- A single plant apparently affected with mosaic was found at Kelowna. One leaf was yellow with a green streak along

a rib and another leaf was green, but yellow streaks were present between the mid-ribs (G.E. Woolliams).

SMUDGE - Colletotrichum circinans (Berk.) Vogl.

Man.- Smudge was heavy on a number of small white onions sent in for examination from Winnipeg.

PARSLEY

YELLOWS - Virus

N.B.- A few specimens of parsley affected with yellows were collected in a garden in York county.

PEA

POWDERY MILDEW - Erysiphe Polygoni DC.

Alta.- Powdery mildew was common late in the season in many gardens. It is probably of little importance.

P.E.I.- Powdery mildew caused moderate to severe damage to Thomas Laxton and American Wonder peas in a garden in Queens county.

ROOT ROT - Fusarium spp.

B.C.- Patches of plants were dead in the hollow places and on the lower levels of a field of Laxton peas at Sea Island, near Vancouver. The roots were diseased and rotting. Cultures yielded a Fusarium; no evidence of Aphanomyces or Pythium were found. About 5 per cent of the total area of the field was affected; the soil was clay (J.W. Eastham).

Alta.- Root rot caused a trace to slight damage in most of the fields examined.

LEAF and POD SPOT - Ascochyta Pisi Lib.

Alta.- Peas were severely damaged by leaf and pod spot in gardens at Edmonton. The second crop in one garden was a failure; the pods, stems, and leaves were severely blighted.

Sask.- A light infection occurred on the pods of field peas at the Experimental Station, Rosthern.

Que.- Leaf and pod spot was very severe on Tall Telephone peas in many fields in Gaspé county. Infection varied from 5 to 100 per cent. High humidities, cool summers, and lack of

sunlight are perhaps all contributing factors to the high infections of A. Pisi in this district (J.G. Coulson).

N.B.- This disease was severe in a garden in York county.

P.E.I.- Leaf and pod spot is fairly common in the gardens in Queens county, but the damage is slight as the crop is usually gathered before the disease becomes injurious.

DOWNY MILDEW - Peronospora Viciae (Berk.) de Bary

B.C.- Downy mildew was present on Laxton and Surprise peas grown for canning at Sea Island. The injury was apparently negligible.

PEPPER

BLOSSOM-END ROT - Cause unknown

Man.- Blossom-end rot was common and rather destructive at Winnipeg.

MOSAIC - Virus

Ont.- Three to 5 per cent of the plants were distinctly dwarfed by mosaic in Halton county.

POTATO

In addition to the reports on potato diseases received from the separate provinces, Mr. Tucker, Chief Potato Inspector, has had summarized the prevalence of disease in fields of potatoes inspected for certification throughout the Dominion. These fields were grown from certified seed. Of the fields inspected 2,176 or 19.3 per cent failed to pass inspection on account of disease, etc. Of the fields rejected on account of disease, mosaic continues to be the most important, 39.8 per cent of the rejections being due to this disease. The percentages of rejections due to other diseases were as follows: Black leg, 7.6 per cent; leaf roll, 3.6; adjacent to diseased fields, 10.5.

The percentage of fields rejected on account of disease has steadily fallen. Last year 24.8 per cent wererejected compared with 19.3 per cent this year.

The percentage of disease found in fields inspected for certification has also declined at a fairly uniform rate. Table 1 gives the average percentage of black leg, leaf roll and mosaic

in the fields inspected during the past ten years.

Table 1.- Percentage of the three most important diseases in fields inspected for certification, 1922-1931.

Year	Number of fields inspected	Average percentage of disease found		
		Black Leg	Leaf Roll	Mosaic
		per cent	per cent	per cent
1922	3283	1.20	0.67	4.50
1923	2914	.62	.44	2.85
1924	5586	.50	.30	1.80
1925	4542	.65	.16	1.66
1926	4212	.37	.14	1.16
1927	8388	.35	.07	.79
1928	9610	.26	.11	.78
1929	8841	.21	.08	.91
1930	9707	.16	.28	.76
1931	11309	.12	.12	.54

The figures show how effective seed certification has been in controlling diseases carried in or on the "seed". Mosaic, the most stubborn disease to eliminate, has been reduced from 4.50 per cent in all fields in 1922, at which time the seed inspection service had been in operation 7 years, to 0.54 per cent in the present year. These figures are all the more remarkable as mosaic, leaf roll, and other diseases controlled by rigid selection of disease-free stock by inspection and certification are often very prevalent in the ordinary fields and where only small amounts of these diseases are present the fields were planted with seed, which was third or fourth generation seed from certified stock.

LATE BLIGHT - Phytophthora infestans (Mont.) de Bary

B.C.- Late blight was found only in the lower Fraser valley. The damage was slight.

Que.- Late blight was destructive in many fields and caused severe tuber rot in storage in some parts of Quebec. Of the fields inspected for certification, about 20 per cent were rejected on account of late blight. Some fields near Chicoutimi were completely destroyed. The disease was also reported from Cap Rouge, Drummondville, and St. Hyacinthe.

N.B.- This disease was severe in two counties, but in the rest of the province only a small amount was present.

N.S.- Late blight was observed in Colchester, Cumberland, Pictou, Antigonish, and Halifax counties, on late-planted Irish Cobbler and late varieties such as Garnet Chili and Green Mountain. As the disease appeared late in the season, the plants remained partly green until frost. Much rot, however, appeared in storage as the following figures show: non-sprayed crops, 15 to 20 per cent; partly sprayed crops, 5 to 10 per cent; and well-sprayed, 0 to 2 per cent.

P.E.I.- Late blight was first observed on August 1, in Queens county. The disease became general by Sept.1 throughout the province, causing heavy losses in all commercial varieties, where the fields were imperfectly sprayed. Abundant rain and cloudy days accompanied the outbreak.

RHIZOCTONIA - Corticium Solani (Prill. & Del.) Bourd. & Galz. (Rhizoctonia Solani Kühn)

B.C.- Rhizoctonia caused severe damage on Vancouver island and in the lower Fraser valley. It was most severe on Irish Cobbler. The disease was also severe in the Rutland district, Kelowna.

Que.- In a 1½ acre field in Gaspé county, 65 per cent of the plants were severely infected; many plants showing aerial tubers. At least 20 per cent of the plants were missing.

N.S.- Rhizoctonia varied greatly in severity in different fields. From counts made during tuber inspection, infection was found to vary from 0 to 23 per cent, averaging 5.4 per cent.

P.E.I.- A light infection of rhizoctonia was reported from Kings county.

COMMON SCAB - Actinomyces scabies (Thaxt.) Güssow

B.C.- Scab was present on Vancouver island and in the lower Fraser valley. The damage was slight.

N.B.- Scab was quite severe in a few localities and moderate infections occurred over the province.

N.S.- Scab was reported from eight counties in Nova Scotia, being present mostly on Irish Cobbler. Counts made during tuber inspection gave infections varying from 0 to 40 per cent, average 3.2 per cent. The heaviest infestations were found on Cobbler in Kings and Cumberland counties.

P.E.I.- Scab caused slight to severe damage to Irish Cobbler and Green Mountain throughout the province.

BLACK LEG - Bacillus phytophthorus Appel

B.C.- Black leg caused slight damage on Vancouver island and in the lower Fraser valley.

Sask.- One field of potatoes was rejected on account of black leg. The average percentage of the disease in 78 fields inspected for certification was 0.03 per cent.

Man.- The average percentage of black leg in 133 fields inspected was 0.32 per cent, five fields being rejected on account of the disease.

N.B.- Black leg was prevalent throughout the province, but the damage was slight.

P.E.I.- Black leg caused slight damage throughout the Island.

EARLY BLIGHT - Alternaria Solani (Ell. & Mart.) Jones & Grout

B.C.- Early blight caused slight damage on Vancouver island and in the lower Fraser valley.

Man.- Very little early blight was present in Manitoba and eastern Saskatchewan in 1931.

N.S.- Infection by early blight was general in Kings, Hants, Colchester, and Annapolis counties; it was most severe on Irish Cobbler. In many fields it caused a sudden collapse of the plants, resulting in a loss of 25 to 30 per cent of the crop.

P.E.I.- Early blight was very destructive especially on early varieties in Queens and Kings counties, causing the early death of the plants. In consequence the yields were materially reduced.

VIOLET ROOT ROT - Rhizoctonia Crocorum (Pers.) DC.

Sask.- Potatoes distinctly affected with violet root rot were found in a small garden near Prince Albert. The diseased potatoes occurred in two spots only, the rest of the garden being free of disease. The garden was a piece of new breaking, which had only been cleared of willow, rose bushes and poplar stumps. The seed had been obtained by the grower from a

neighbour, who had been growing the same stock for three years. The neighbour's potatoes were free from the disease and at no time had he had any trouble of this nature. Very few, if any, potatoes are imported into the Prince Albert district as the local stock is sufficient to supply the demand. It would, therefore, appear that the infection was of local origin. The disease was identified by Dr. H.T. Güssow (J.H. Marritt). (See discussion under alfalfa violet root rot).

LEAF ROLL - Virus

B.C.- Leaf roll was general on Vancouver island and in the lower Fraser valley. The damage was slight. The disease was also observed in the Rutland district, Kelowna.

Sask.- The percentage of leaf roll present was as follows: in 78 fields inspected for certification, 0.03 per cent; in 75 fields passed, 0.02; in 3 fields rejected, 0.4.

Man.- Leaf roll was present as follows: in 133 fields inspected, 0.3 per cent; in 116 fields passed, 0.1; in 17 fields rejected, 1.03. Four fields were rejected on account of leaf roll.

N.B.- A small percentage of leaf roll was found in each county.

P.E.I.- Leaf roll caused slight damage in P.E.I.

MOSAIC - Virus

B.C.- Mosaic was general on Vancouver island and in the lower Fraser valley. The damage was slight. The disease was also present at Kelowna.

Sask.- The merest trace of mosaic was present in fields inspected for certification.

Man.- Three fields were rejected on account of mosaic out of 133 fields inspected for certification.

N.B.- Mosaic was general throughout the potato section of the province.

P.E.I.- Mosaic caused slight to moderate damage on Bliss Triumph and Green Mountain.

WITCHES' BROOM - Virus

B.C.- Witches' broom was severe in a few fields in the lower Fraser valley.

Sask.- Four plants were found affected with what appeared to be witches' broom in a large plot at the University, Saskatoon,

Man.- A single plant affected with witches' broom was found in a ½ acre plot of Early Ohio.

N.B.- Witches' broom was found in fields planted with imported seed.

P.E.I.- One per cent of the plants were affected with witches' broom in a garden at the Experimental Farm, Charlottetown.

SPINDLE TUBER - Virus

B.C.- Spindle tuber was general on Vancouver island. The damage was slight.

Man.- Spindle tuber affected 0.6 per cent of plants in a field of Irish Cobbler.

N.B.- Spindle tuber was general throughout the province.

P.E.I.- A trace of spindle tuber was found on Irish Cobbler throughout the Island.

DRY ROT - Fusarium spp.

B.C.- Dry rot caused by Fusarium spp. was general in storage on Vancouver island and in the lower Fraser valley.

P.E.I.- A trace of dry rot was already showing in storage by October in Queens county. The disease is more prevalent late in the storage period.

TIP BURN - Non-parasitic

Sask.- Tip burn caused a trace of damage in the Horticultural garden at the University and in the city gardens, Saskatoon.

FUSARIUM WILT - Fusarium oxysporum Schlecht.

B.C.- Wilt attributed to Fusarium oxysporum was present on Vancouver Island and in the lower Fraser valley. The damage was slight.

Man.- Wilt was very prevalent throughout Manitoba and eastern Saskatchewan, being present to a slight extent in practically every field. The cause was undetermined.

Que.- A wilt disease of potato was very prevalent this year in Quebec. It was first noted in Champlain county on August 3, in Temiscouata county on August 12, and by the end of the month it had been reported from almost every county. It was more severe on dry sandy soils such as are found in Champlain, Portneuf, and Temiscouata counties. Green Mountain seemed to be the most susceptible variety.

The first symptom of the disease is a sudden wilting of one or more stems and then of the whole plant. The diseased plant loses its bright green colour, but still remains green for a few days. It finally turns yellow and soon dies. The vascular tissues of the stems and roots do not show a brownish discoloration, but sometimes the tuber-bearing stolons are decayed. The disease is very virulent and spreads rapidly in widening circles and in many fields over 90 per cent of the plants were more or less uniformly affected. Potatoes growing in virgin soil or soil, which has not been planted to potatoes for 10 to 15 years, were more seriously affected than those on older soils.

On digging up a diseased plant, one or two tubers are usually found partly or wholly decayed or they may show a soft blackening at the stem or the seed end, or around the eyes. The external symptoms are similar to those of late blight rot, but when pressure is applied to the affected area, the skin gives way and the tissues are soft, yellowish white, sticky and foul smelling. Isolations made by Mr. C. Perrault from freshly collected material have yielded both bacteria and fungi. The causal organism has not been definitely determined. The weather was dry and very warm during July (B. Baribeau).

SILVER SCURF - Spondylocladium atrovirens Harz

Sask.- Silver scurf is commonly seen at seed fairs on Early Ohio and Irish Cobbler potatoes, which have been washed.

P.E.I.- A trace to a moderate infection of silver scurf was found on Irish Cobbler in October in Queens county. The damage is usually greater towards the end of the storage season.

POWDERY SCAB - Spongospora subterranea (Wallr.) Lagerh.

P.E.I.- Powdery scab affected 25 per cent of the tubers in

one lot of Bliss Triumph in Kings county. The damage was slight.

GIANT HILL - Virus

B.C.- Giant Hill was general on Vancouver island. The damage was slight.

NET NECROSIS - Cause undetermined

Man.- In the 1930 crop, early varieties, such as Burpee's Early, Bovee, and Carter's Early Favourite, seemed to be more susceptible to net necrosis than others. Almost one per cent of the tubers were affected.

SEED-PIECE ROT - Cause undetermined

In the dried-out areas of Saskatchewan and Manitoba, fields showed stands of only 5 per cent of the plants, where cut sets were used, while 95 per cent of plants emerged under the same conditions, where whole sets were planted.

PHOMA ROT - Phoma tuberosa Melhus, Rosenbaum & Schultz

P.E.I.- A trace of Phoma rot was already present on Irish Cobbler in October.

BICHLORIDE INJURY

P.E.I.- Treating with bichloride of mercury severely injured 45 per cent of the sets in a lot of Irish Cobbler in Kings county. The damage was severe; the injured seed rotted and failed to produce plants.

SOFT ROT - Pythium sp.

B.C.- A soft rot caused by Pythium sp. was observed a few times during harvesting and storage of the crop on Vancouver island and in the lower Fraser valley.

LEAF SPOT - Botrytis sp.

N.B.- Severe damage was caused by this leaf spot in a 4-acre field of Bliss Triumph at the Experimental Station, Fredericton. The Botrytis appears to be weakly parasitic, following tip-burn, insect injury, etc. It fruited abundantly on affected leaves and it was the only organism on leaves showing these spots. (D.J. MacLeod)

RHUBARB

CROWN ROT - Cause undetermined
Alta.- Crown rot is common and often severe.

LEAF SPOT - Ascochyta Rhei Ell. & Ev.
Que.- The leaves of rhubarb were moderately to severely infected in a garden in Sherbrooke county. The damage was very little as the disease developed very late in the season.

P.E.I.- This leaf spot occurs generally in all gardens.

STEM ROT - Botrytis sp.
Alta.- Stem rot is fairly common in Alberta. In five gardens a moderate amount of rot was present.

LEAF SPOT - Cause undetermined
Sask.- A leaf spot, believed to be due to bacteria, was very common around Saskatoon (P.M. Simmonds).

CROWN GALL - Pseudomonas tumefaciens (E.F.Sm. & Towns.) Duggar
N.S.- A few specimens of crown gall are found each spring in one patch of rhubarb at Kentville.

LEAF SPOT - Phyllosticta straminella Bres.
Man.- A severe outbreak of this leaf spot was found in one patch.

P.E.I.- This leaf spot is fairly common, but causes no apparent damage. It was observed once this year in Queens county.

RUTABAGA

BLACK LEG - Phoma Lingam (Tode) Desm.
Que.- A single infected rutabaga was found in a field in Sherbrooke county.

ALTERNARIA LEAF SPOT - Alternaria Brassicae (Berk.) Bolle
(=A. herculea (Ell. & Mart.) J.A.Elliott)
Que.- This leaf spot was common on the older leaves in a field in Sherbrooke county.

SPINACH

DOWNY MILDEW - Peronospora effusa (Grev.) Rabh.
Ont.- Downy mildew severely affected King of Denmark spinach in a field in Lincoln county. Two other varieties, Blumingsvale and Viroflay, growing near the first were slightly affected and entirely free from mildew respectively.

BACTERIAL SOFT ROT - ?Bacillus carotovorus L.R. Jones
Alta.- About 3 per cent of the plants were killed in a garden at Edmonton.

SQUASH

BACTERIAL WILT - Bacillus tracheiphilus E.F.Sm.
Ont.- Bacterial wilt affected 3 per cent of the plants in a patch of Banana squash in Lincoln county. Hubbard squash was resistant.

SWISS CHARD

TIP BURN - Non-parasitic
B.C.- About one per cent of the plants were affected with tip burn in a varietal test plot at Summerland. The heart leaves die in the affected plants.

TOBACCO

The information reported below was compiled by Mr. T. G. Major, Tobacco Division, Ottawa.

(1) Seed-Bed

DAMPING-OFF - Pythium de Baryanum Hesse
A few cases were reported around Tillsonburg, Ont. In the Northern District of Quebec many beds were almost completely destroyed. Some damage also occurred in the Southern District.

BLACK ROOT-ROT - Thielavia basicola Zopf
Numerous cases were found in the L'Assomption-Montcalm region and an occasional instance in the Old Belt of Ontario.

SEEDBED MOULD - Pyronema confluens (Pers.) Tul.
Several cases occurred in Colchester South Tp., Essex Co., Ont. Formaldehyde (1:1000) checked the fungus but Uspulun was

not effective. Ventilation appeared to be an important factor.

BROWN ROOT-ROT (Cause unknown) The majority of the plants were affected in the Station beds at Summerland, B.C. The roots were brown in colour and root development was insufficient to sustain the plants without wilting.

SUNBURN - Considerable damage was reported in the Northern District of Quebec.

(2) Field

BLACK ROOT-ROT - Thielavia basicola Zopf

In Ontario moisture conditions were favourable to the disease but high temperatures kept it in check. Many of the fields in the Burley sections showing early season infestations recovered to a considerable extent. Much less damage occurred in Quebec, again due to the warm weather.

BROWN ROOT-ROT - Cause unknown

A few cases occurred in Quebec in fields where the tobacco had been preceded by timothy. In Ontario flue-cured tobacco grown after a 'rest crop' of fall rye showed an uneven stand in some localities.

WILDFIRE - Pseudomonas Tabacum (Wolfe & Foster) Stev.

No cases were reported in 1931 in the commercial districts. A few plants were affected at the Central Experimental Farm. The infestation was traced to a sample of seed of Nicotiana affinis.

ANGULAR LEAF-SPOT - Pseudomonas angulata (Fromme & Murray) Stev.

Minor outbreaks were reported on late crops in both Ontario and Quebec.

MOSAIC - Virus

The trouble was less prevalent in Quebec than in past years. In Ontario, particularly in the Old Belt many severe outbreaks were reported, some fields having infestations ranging up to 75 per cent. The priming varieties, Cash and White Stem Orinoco, appeared to be most seriously affected. In B.C, 48 per cent of the flue crop contained approximately 2 per cent affected plants. In the case of Burley the infestation was about 1 per cent.

FRENCHING - Considerable damage in the New Belt of Ontario and in British Columbia.

CURLY DWARF (Cause unknown) Slight injury in the Okanagan Valley, B.C.

PHYSIOLOGICAL LEAF SPOTS - In Ontario heavy local showers were followed by a breaking down of the leaf tissues.

NITROGEN STARVATION - A premature yellowing of Burley occurred on the lighter soils in the Old Belt of Ontario where less than 500 pounds per acre of low-analysis fertilizers were applied.

LIGHTNING INJURY - One case was reported in Maidstone Tp., Essex Co., Ont.

HAIL INJURY - Some 700 acres were damaged in Norfolk Co., Ont. of which 200 acres were a total loss. In Essex and Kent approximately 300 acres were affected.

FERTILIZER INJURY - In Ontario heavy applications of highly concentrated fertilizers not sufficiently mixed with the soil resulted in a stunted growth.

WIND DAMAGE - Considerable loss in the Ontario districts late in August.

(3) Curing Barns

POLE BURN - Slight damage was reported in some localities in Ontario.

TOMATO

BLOSSOM-END ROT - Non-parasitic

B.C.- Blossom-end rot was general on Vancouver island.

Alta.- The disease caused moderate damage in a garden at High Prairie.

Que.- A trace of blossom-end rot was present at the Experimental Farm, Ste. Anne de la Pocatière.

MOSAIC - Virus

B.C.- Mosaic infected 1½ per cent of the plants growing under glass at Kelowna. About 5 per cent of the plants were affected in a field of Earliana also at Kelowna.

Ont.- Mosaic affected 10 per cent of the plants in a field of Chalk's Jewel in Lincoln county. The damage was slight.

N.B.- Mosaic is widespread in the province; infections ranged from 0 to 30 per cent.

STREAK - Virus

B.C.- Streak was general in the greenhouses on Vancouver island and caused considerable loss in some.

Sask.- Seven plants were affected with streak out of 800 to 1000 plants in the Horticultural plots at the University, Saskatoon. All the infected plants were on the outside rows. This is probably the first report of streak for Saskatchewan.

LEAF MOULD - Cladosporium fulvum Cke.

B.C.- Leaf mould occurred in some of the commercial greenhouses at Kelowna, while others were free of the disease. In the infected houses the percentage of diseased plants varied from slight to 100 per cent. Leaf mould was also general in the greenhouses on Vancouver island. The damage was severe.

Ont.- A severe infection of leaf mould was present in greenhouses near Brighton. The plants were noticeably weakened.

Que.- Leaf mould was quite common in greenhouses at Côte des Neiges, Montreal, but the infection was moderate.

EARLY BLIGHT - Alternaria Solani (Ell. & Mart.) Jones & Grout

B.C.- Early blight was general on Vancouver island, but it caused slight damage.

Ont.- Early blight infected lightly a field of Grand Rapids tomatoes in Lincoln county. The leaves were spotted, and the fruit, especially on the lower truces, was beginning to rot. A slight general infection was also present on Earliana in Welland county.

Que.- Some early blight was present on all the varieties at Ste. Anne de la Pocatière. It caused no perceptible damage. A

WILT - Fusarium Lycopersici Sacc. and Verticillium albo-atrum Reinke & Berth.

B.C.- Wilt due to these fungi was general in greenhouses on Vancouver island. It is very destructive when conditions are favourable for the disease.

RHIZOCTONIA - Corticium Solani (Prill. & Del.) Bourd. & Galx. (Rhizoctonia Solani Kühn).

B.C.- Rhizoctonia is general on tomatoes on Vancouver island.

TURNIP

CLUB ROOT - Plasmodiophora Brassicae Woron.

Que.- Ninety per cent of the plants were affected with club root in a small field of about ½ acre at St. Felix d'Otes.

N.B.- From 0 to 100 per cent of the plants were affected in the experimental plots, Fredericton. The damage was correspondingly slight to severe.

N.S.- Susceptible varieties were a total loss in the test plots at Kentville.

P.E.I.- Club root was very common resulting in considerable losses to the farmers. When the plants were attacked in the seedling stage, the crop was frequently a total loss. A resistant strain of Bangholm has been grown successfully in infected soil.

BROWN HEART - Non-parasitic

N.B.- Brown heart was general throughout the province. Infaction ranged from 5 to 100 per cent. All varieties were apparently affected.

WHITE SPOT - Cercosporella albomaculans (Ell. & Ev.) Sacc.

N.B.- Moderate to severe infections of white spot occurred on some of the experimental plots at Fredericton.

BLACK ROT - Pseudomonas campestris (Pamm.) E.F.Sm.

N.B.- A slight infection of black rot was noted at the Experimental Station, Fredericton.

by Gussow (Phytopath. 11:380-383. 1911). Stepanoff (see Rev. Appl. Myc. 10:493-494. 1931) states that excessive irrigation and manuring appeared to increase the incidence of the disease. This could hardly be so in Saskatchewan as it has been extremely dry this season and the plants were not watered artificially.

P.E.I.- A trace of black rot was found in a field of Halls Westbury in Queens county.

BACTERIAL DECAY - Cause undetermined

Man.- A grower sowed two lots of seed, both marked "Extra-Early Purple Top Milan". Many of the turnips from one lot of seed only had decayed to a slimy mass or only a hole indicated where a turnip had been. The disease caused moderate damage (G.R. Bisby).