III. DISEASES OF VEGETABLE AND FIELD CROPS

ASPARAGUS

RUST (Puccinia Asparagi) caused serious injury to asparagus, said to be Martha Washington, in a field at Waterville, N.S. This appears to be the first record of the occurrence of the rust in Nova Scotia. (J.F. Hockey)

FASCIATION (non-parasitic). A trace was observed in Lincoln Co., Ont. A few fasciated plants were noted in some fields in Jacques Cartier and Laval Counties, Que.

BEAN

MOSAIC (virus). A slight amount of mosaic was found in most bean fields in the Interior of British Columbia, but it was rarely severe and usually less than 1% of the plants were affected. In other parts of the Dominion the percentages varied widely: Coaldale, Alta., trace; Lethbridge, 7%; Saskatoon, Sask., 25%; Rosthern, trace in one variety; Ontario and Quebec, trace to 5%; Kentville, N.S., single plant; Queens Co., P.E.I., 7% and 2% respectively.

ANTHRACNOSE (Colletotrichum Lindemuthianum) was reported as follows: B.C., none seen in the Interior and a trace to 2% at the Coast; Medicine Hat, Alta., moderate infection in a commercial planting. Up to 90% of the plants infected in Kent Co., Ont., the damage being more extensive than in 1938; in a 16-acre field at Chatham a few of the spots on the pod penetrated to the seed. General and quite severe in most fields, but not as injurious as bacterial blight in the 27 fields of Brittle Wax and Pencil Pod beans grown for seed at St. Eustache, Lanoraie, Lacole, and St. Valerien, Que., and inspected at the end of the growing season (E. Lavallee). Infection was 5% in a field in York Co., N.B. Infection was slight this year in most gardens at Kentville, N.S., and also slight at Grand Pre. It destroyed 60% of the plants in relief gardens at Caseumpec, P.E.I.

BACTERIAL BLIGHT (Phytomonas Phaseoli). Infection was general and in some fields severe in the Brooks and Lethbridge districts in southern Alberta. It was also reported from Edmonton, Hughenden, and Peace River. The damage was a trace to moderate in the varietal plots at Olds and Lacombe and a trace to severe at Lethbridge. Although halo blight is present, it seems much less common. Bacterial blight was moderate in the gardens at Saskatoon and the Melfort Station, Sask.

Bacterial blight was moderate on Bountiful and Davis White Wax at Brandon, Man.; a trace occurred on other varieties. At Morden the disease was severe on some varieties, e.g. Davis White Wax. The disease was rather

severe in an 8-acre field at Streetsville, Ont.; about 4% of the plants were wilted and spots on the pods were numerous (J.K. Richardson). Out of 27 fields inspected in the Montreal area, Que., 26 were severely diseased; the remaining field, which was sown with beans selected from healthy plants only was remarkably clean (E. Lavallee). Bacterial blight was moderate in a field in York Co., N.B. The disease was also fairly severe at Kentville, N.S., and in Queens Co., P.E.I.

HALO BLIGHT (Phytomonas Medicaginis var. phaseolicola) was found at Lillouit, Rayleigh Mountain, Armstrong, Vernon and Grand Forks, B.C. In some fields only a trace of disease was found; in others, it was general and infected from 50 to 75% of the plants. The causal organism was definitely determined (G.E. Woolliams and H.R. McLarty). Halo blight was found in the coast region, in three fields where the crop was grown for seed. It was particularly severe in a field at Langley Prairie. The crops were all Black Pencil Pod and were grown from certified seed imported from Ontario (W.R. Foster). Slight to moderate infections were observed at Brooks and Lethbridge, Alta. (M.W. Cormack). The disease was reported as severe in Red Kidney and Altoba beans in the University gardens, Winnipeg, Man. The organism was isolated (W.A.F. Hagborg). As my correspondents report this is the first record of halo blight in B.C. and Man. (I.L. Conners)

RUST (Uromyces appendiculatus) was heavy in 2 acres of Kentucky Wonder on Lulu Island, B.C. (W.R. Foster). Aecia literally covered the leaves of Kentucky Wonder sent from a garden at Beavan Lake, near Arundel, Que., on July 16. Uredinia and telia were abundant on specimens received in August. Arthur (Manual Rusts U.S. and Canada p. 296. 1934) states that "aecia .... are rarely observed" (I.H. Crowell). A trace of rust occurred also on pole beans at Kentville, N.S., and Queens Co., P.E.I.

GREY MOULD (Botrytis cinerea) affected 5% of the pods in a greenhouse at Macdonald College, Que., in June (I.H. Crowell).

ROOT ROT or FOOT ROT (Fusarium spp.) caused a trace of damage at Coaldale, Alta. (G.B. Sanford). Odd plants of Early Wonder were wilted at Morden, Man. Isolations yielded Fusarium spp. (W.L. Gordon). Many plants showed severe stem lesions just below ground level in a field of Pencil Pod Wax at Streetsville, Ont. (J.K. Richardson).

ROOT and STEM ROT (Rhizoctonia sp.) was general at Lethbridge, Alta., causing about 1% damage (G.B. Sanford). Traces of stem rot were present in Scarlet Runner beans in Queens Co., P.E.I. (R.R. Hurst)

SUNSCALD (non-parasitic) varied from a trace to severe in the Interior of B.C., averaging slight to moderate.

BEET

CERCOSPORA LEAF SPOT (C. beticola) was slight in a planting in York Co., N.B., and moderate in a garden at Charlottetown, P.E.I.

SCAB (Actinomyces scabies). A few lesions were seen on several roots in Queens Co., P.E.I.

ROOT ROT (Rhizoctonia sp.) affected several roots in a garden in Queens Co., P.E.I.

CABBAGE

CLUB ROOT (Plasmodiophora Brassicae) was general in the market gardens on the lower mainland, B.C.; the damage was moderate (W. Jones). Club root was very destructive in many fields of Laval and Jacques-Cartier Counties, Que.; it was also found in home gardens in various localities (E. Lavallee). A few plants were severely injured in a garden at Charlottetown, P.E.I., and 4 reports of the disease in P.E.I. were received. (R.R. Hurst)

BLACK ROT (Phytomonas campestris) affected nearly all cabbage fields near Chatham, Ont., under contract to a canning company. In one field, 65% of the plants were infected, and in 4 others, 40%. The damage was severe. (L.W. Koch)

BLACK LEG (Phoma lingam) was general on the leaves, causing slight damage at the Sidney Station, B.C. (W. Jones)

DAMPING OFF (Rhizoctonia Solani). Diseased specimens were received from Deep Brook, N.S. (D. Creelman)

SOFT ROT (Erwinia carotovora). One affected plant was brought to the Laboratory, Charlottetown, P.E.I. (R.R. Hurst)

POWDERY MILDEW (Erysiphe Polygoni). A single plant of several under cages in a greenhouse at Ste. Anne de la Pocatiere, Que., became severely infected with powdery mildew in November. (C. Perrault)

CARROT

YELLOWS (Virus). Scattered plants of all varieties grown were infected at Brandon, Man. Yellows was common on carrot in commercial fields in York, Sunbury, Queens, Westmoreland, Carleton, and Charlotte counties, N.B. In two such fields in Sunbury Co., 45% and 50% of the crop respectively were affected and less than 10% of the affected plants produced marketable roots (D.J. MacLeod). According to correspondents from Leitche's Creek Station, N.S., quite a percentage of the carrots in their market garden have

failed to produce sound roots in the last two years. "The tops turn light in colour and get rather bushy and there will be a carrot all covered with roots or there will be no carrot at all, just a kind of fuzzy root". Frequently the affected plants go to seed. Their yield has been cut to quite an extent. (I.L. Conners). In a garden at Kentville, 1% of the plants were affected (K.A. Harrison). About 95% of the carrots were affected in a garden at Charlottetown, P.E.I., but the roots were not affected very much. (R.R. Hurst)

LEAF BLIGHT (Macrosporium Carotae) was of fairly general occurrence in the Lower Mainland and on Vancouver Island, B.C.; it caused considerable damage in one field in North Saanich. (W. Jones)

SOFT ROT (?Erwinia carotovora) destroyed 50% of the plants in a garden at Coalhurst, Alta. (R.A. Ludwig)

BACTERIAL BLIGHT (Phytomonas Carotae). A heavy, general infection occurred at Brandon, Man. This was the most extensive infection yet seen.

CAULIFLOWER

CLUB ROOT (Plasmodiophora Brassicae) was present in most cauliflower fields in Laval and Jacques Cartier Counties, Que.; the disease generally appears in patches (E. Lavallee). Traces were seen at the Station, Charlottetown, P.E.I., and one specimen was brought to the Laboratory. (R.R. Hurst)

WHIPTAIL (non-parasitic) was found in Ont. for the first time in the fall of 1938 and it developed again in several fields this past summer. Inspections of truck farms near Weston made by members of the Departments of Horticulture and Botany revealed the fact that a large percentage of the crop on several farms had been rendered useless by the trouble. Analyses were made of the soil from fields in which Whiptail was serious and from neighboring fields in which the cauliflower crop was normal. These showed that soils from the fields where Whiptail was serious, were acid in reaction, while the soils from fields with a normal crop were neutral or alkaline in reaction. In many instances, but not in all, the soils from fields badly infected by Whiptail were low in phosphorus in comparison with their potash content (J.E. Howitt). Whiptail was observed in one field at Ste. Dorothee, Que. (E. Lavallee)

WIRE STEM (Rhizoctonia Solani) has become a serious disease in the seed beds in Laval and Jacques Cartier Counties, Que. Three applications of $HgCl_2$ are recommended. (E. Lavallee)

SOFT ROT (Erwinia carotovora). An outbreak of soft rot occurred in the Leamington district, Ont., and resulted in the price being cut in two for about a week. One grower estimated his loss at $400. (L.W. Koch)

BLACK ROT (Phytomonas campestris). Two fields were found severely infected at St. Laurent, Que.; these same fields were affected last year. (E. Lavallee)

BROWNING (boron deficiency). This outbreak in Queens Co., P.E.I. affected 85% of the plants and the loss was heavy. Some control was obtained where boron was used under test. (R.R. Hurst)

CELERY

LATE BLIGHT (Septoria Apii). A trace of infection was observed at Lacombe, Alta.

Late blight (S. Apii-graveolentis) was not as common as usual in Ont., due to the dry conditions in the early season. However, with increased precipitation in late August and early September, some of the late crops became slightly infected. (J.K. Richardson)

The disease was satisfactorily controlled in well sprayed fields of celery in Que., but it was more or less severe in small unsprayed celery plantings (E. Lavallee). A slight infection occurred in a field in York Co., N.B. (D.D. Dolan). Traces of late blight were observed in stores and markets at Charlottetown, P.E.I. (R.R. Hurst)

EARLY BLIGHT (Cercospora Apii). On August 1, at Burlington, Ont., only the occasional field was found affected. Where spraying is regular and thorough, the disease is absent (J.K. Richardson). For the 4th consecutive year a field at St. Dorothee, Que., has been found quite heavily infected. The field was dusted but operations began too late; no rotation is practiced. (E. Lavallee)

STEM CRACKING (boron deficiency) seems to be general and causes considerable loss to some growers in Que. At Charny, where a grower had applied lime to the soil, the plants remained stunted and took on a rusty appearance, while the heart of each plant remained undeveloped. Affected plants on this farm reached about 10" in height, but others that received applications of borax grew normally. The disorder was first noticed about August 10, and became more serious as the season advanced (C. Perrault). Three fields in Laval Co. were severely injured. (E. Lavallee)

HEART ROT (cause unknown) was observed in 7 fields between Deschambault and Ste. Anne de la Pocatiere, Que. According to the Provincial Instructor in Horticulture practically every grower has suffered more or less loss from the trouble. In the fields visited, the damage varied from 10% to 90% and if, in some cases, the crop had been harvested two weeks later, it would have been a total loss. When the disease is not too far advanced, growers may still get a certain price for the crop. Plants being grown in the Laboratory greenhouse for experimental purposes

were almost all destroyed by heart rot (C. Perrault). Heart rot caused practically no damage in the Montreal district this year; the losses were very heavy in 1937 and 1938. (E. Lavallee)

SCLEROTINIA ROT (S. sclerotiorum) affected and destroyed about 10% of the plants when stored in a greenhouse in Lincoln Co., Ont., instead of being pitted. The ground was heavily watered. The disease appeared in areas. (G.C. Chamberlain)

DAMPING OFF (various), as well as root rot, caused considerable loss in a small contaminated greenhouse in Lincoln Co., Ont. Although the compost was sterilized, the old flats were not. (J.K. Richardson)

YELLOWS (?virus). A moderate to severe infection was found at Lethbridge, Alta. The symptoms were the same as those observed several years ago at Edmonton, and no organism was isolated. (A.W. Henry)

CHINESE CABBAGE

CLUB ROOT (Plasmodiophora Brassicae) was found in 3 fields in Laval Co., Que. This disease always causes severe injury to Chinese cabbage. (E. Lavallee)

CUCUMBER

BACTERIAL WILT (Erwinia tracheiphila) was found frequently in the Montreal district, Que., but the losses were not severe. (E. Lavallee)

ANGULAR LEAF SPOT (Phytomonas lachrymans). A slight infection was observed on 20% of the plants at Medicine Hat, Alta. (R.A. Ludwig). The disease was quite severe in York, Sunbury and Kings Counties, N.B., early in the season, but it became less important with the coming of dry weather in midsummer. (D.D. Dolan)

SCAB (Cladosporium cucumerinum) was severe in three fields at St. Laurent, Que.; many diseased specimens were observed on the public markets (E. Lavallee). No scab was seen in York or Sunbury counties, N.B., but around Sussex in Kings 10-15% of fruit were unmarketable due to the disease. Scab was less important than in 1938 on account of the dry weather. (D.D. Dolan)

SCLEROTIAL ROT (Sclerotinia sclerotiorum) was rather severe in a greenhouse at Medicine Hat, Alta.; in one planting 20% of the plants were affected.

MOSAIC (virus). Two canning companies in Essex and Kent Counties, Ont., reported damage in their "contract" crops due to mosaic. In one ½-acre of cucumbers 20% of the plants were affected (L.W. Koch). Mosaic affected 1% of the plants in a greenhouse in Lincoln Co. (G.C. Chamberlain)

EGGPLANT

EARLY BLIGHT (Alternaria Solani). A trace was present at Kentville, N.S., on eggplant planted adjacent to tomatoes, which were severely defoliated. (K.A. Harrison)

HOP

DOWNY MILDEW (Plasmodiophora Humuli). There was considerable basal spike infection in the Fraser River Valley, B.C., on the Clusters variety, but the disease was kept in check. Leaf infection was prevalent in June due to rain. Damage to the crop on the whole was slight since practically no cone infection occurred owing to good harvesting weather. Branling and Brewers Gold were also affected, but to a less degree than Clusters. This disease was found in small plots of Clusters established by Japanese growers in the Matsqui, Mission, and Haney districts. (W. Jones)

CHLOROSIS (virus). Affected plants are still prevalent in the hop yards in the Fraser River Valley, B.C., particularly in Fuggles and Golding. In one Fuggles yard, where roguing has been practised consistently a great improvement has been made in the uniformity and foliage colour of the plants. (W. Jones)

HORSE RADISH

LEAF SPOT (Ramularia Armoraciae). A slight infection was observed at Beaverlodge, Alta.

KALE

POWDERY MILDEW (Erysiphe Polygoni). A slight, general infection was observed at the Station, Sidney, B.C.

LETTUCE

ANTHRACNOSE (Marssonina Panattoniana) was severe on New York No. 12 at Brandon, Man., and in the suburban districts, East St. Paul and East

Kildonan, of Winnipeg. At the last point the crop was unsaleable. This is the first record of its occurrence in Manitoba. (J.E. Machacek)

DROP (Sclerotinia sclerotiorum) affected 10% of the lettuce in a 4-acre field in Surrey, B.C. (W. Jones)

TIP BURN (Non-parasitic) is general throughout the Okanagan Valley, B.C. The damage was slight this season (G.E. Woolliams). A narrow margin of the outer leaves of some 2,000 plants was scorched and dead. The plants were in cold frames at a grower's in Lincoln county, Ont. It was thought that the trouble was due to too high a temperature and low humidity, for a few plants grown at a cooler temperature were healthy. (G.C. Chamberlain)

MELON

BACTERIAL WILT (Erwinia tracheiphila) affected 4% of the plants in a plantation in Essex Co., Ont.; the damage was slight (L.W. Koch). The disease was occasionally observed in Laval and Jacques Cartier Counties, Que. (E. Lavallee)

LEAF SPOT (Cladosporium cucumerinum) was general in the Aldershot district, Ont., but it caused little damage, because only the leaves were affected. In the western part of the province the vines were severely defoliated resulting in marked reduction in yield, except in a few cases where the plants were sprayed. (J.K. Richardson)

ANTHRACNOSE (Colletotrichum lagenarium) was present in all plantations in the Leamington district, Ont. The damage was moderate, but less extensive than in 1938. (L.W. Koch)

MOSAIC (virus). About 5% of the plants were affected in an acre field in Lincoln County, Ont. (J.K. Richardson)

WILT (Fusarium sp.). The entire crop in the Aldershot district, Ont., appeared to be affected and it was estimated that there would be a 50% reduction in yield. Extremely dry weather in July was partly responsible. (J.K. Richardson)

ONION

DOWNY MILDEW (Peronospora Scheideniana) was prevalent in the Lower Mainland, B.C., and at Duncan, Vancouver Island, and neither dusting nor spraying was effective (W. Jones). Downy mildew was found in 2 out of 16 fields inspected in Eastern Ont.; 3% and 6% of plants respectively were affected. In Quebec infections were a trace, 20%, and 25% in the 3 fields examined. (D.M. Simpson)

NECK ROT (Botrytis Allii). An outbreak of neck rot and soft rot was observed in Spanish onions soon after they were harvested and placed in storage in Essex Co., Ont. Every grower suffered some loss, due to decay of the onions and in grade. One grower reported a loss of 500 bushels from 8 acres. (L.W. Koch)

LEAF SPOT (Alternaria sp.). A moderate infection was found at Morden, Man.

LEAF BLOTCH (Fusarium moniliforme). Only a trace of infection was observed at Morden, Man.; isolations from the infected tissue yielded F. moniliforme. (W.L. Gordon)

SOFT ROT (Erwinia carotovora). Where Spanish onions were irrigated in midsummer in the Leamington district, Ont., losses ran as high as 15% of the crop. (L.W. Koch)

PINK ROT (Fusarium sp.) was patchy in a 2-acre field at Cloverdale, B.C.; the damage was slight due to later recovery. (W. Jones)

FUSARIUM BULB-ROT (F. oxysporum Schl. f. 7 Wr.). Some fields in the Kelowna district, B.C., are so heavily infested with the pathogen that onion production is unprofitable in these fields; probably 60% of the bulbs are affected. The average infection in the district is 5%. For many years, the disease was confined to the Kelowna district, but recently it has appeared in the Vernon area. The pathogen has been identified by W.L. Gordon (G.E. Woolliams). Several growers are apparently suffering considerable losses from bulb-rot. The extent of the damage is not known because the crop was harvested when it was examined. (J.K. Richardson)

PARSNIP

YELLOWS (virus) was common in parsnips in York, Sunbury, Charlotte, and Northumberland counties, N.B. From 2% to 5% of the plants were affected in the 8 acres examined; the damage was slight. (D.J. MacLeod)

LEAF SPOT (Ramularia Pastinacae). A severe infection was observed in a garden at Kentville, N.S. (J.F. Hockey)

PEA

DOWNY MILDEW (Peronospora Pisi) was slight at the Station, Sidney, B.C.; it was, however, somewhat heavier in the Fraser River Valley. (W. Jones)

POWDERY MILDEW (Erysiphe Polygoni) was general and severe in the Lethbridge district, Alta., and in many fields the yield was seriously

reduced. Powdery mildew was severe at New Carlisle, Que., on August 22, while none was found at Cap d'Espoir. The peas were ruined before they were harvested at New Carlisle, but they escaped any appreciable damage at Cap d'Espoir (C. Perrault). Powdery mildew developed to some extent late in the season in Queens Co., P.E.I. (R.R. Hurst)

LEAF and POD SPOT (Ascochyta Pisi). Infection ranged from a trace to moderate in the plots at Olds, Alta. A moderate infection was present at Brantford, Ont., on July 11 (J.K. Richardson). The disease was fairly heavy at New Carlisle, Que., on August 2, while traces only were present at Cap d'Espoir (C. Perrault). Leaf and Pod Spot was fairly prevalent on the vines after harvest at Charlottetown, P.E.I.

RUST (Uromyces Fabae). Slight infections were observed in fields of canning peas at Ste. Martine and St. Jean, Que. A light infection also was present at New Carlisle on August 2, and also at Macdonald College and in all 3 counties of P.E.I.

ROOT ROT (Fusarium spp.). Infection ranged from a trace to severe in the varieties at Lacombe, Alta. In a canning area near Brantford, Ont., the disease was so severe that the crop had to be harvested prematurely, resulting in a loss of 30% of the crop. It was also reported as destructive in Essex county. A trace of root rot was found at Cap d'Espoir, Que. Root rot was quite severe in a garden where the disease has been observed for the past two years at Kentville, N.S. The pathogen was identified as F. oxysporum by Dr. W.L. Gordon. (D. Creelman)

LEAF BLOTCH (Septoria Pisi). A general light infection was observed at Lacombe, Alta. The disease was heavy on plants maturing seed at Charlottetown, P.E.I.

MOSAIC (virus). Infection was general in a field near Brantford, Ont., due to a rather severe infestation of asphids. The loss was estimated at 20% (J.K. Richardson). About 50% of the plants were affected in a small garden at Kentville, N.S. (J.A. Boyle)

PEPPER

MOSAIC (virus) affected about 3% of the plants in a planting in Wentworth Co., Ont.; the growth was markedly reduced. (G.C. Chamberlain)

FRUIT SPOT (cause unknown). About 20% of the fruit were spotted in a field at Ste. Dorothee, Que.; Alternaria was isolated from the spots. (E. Lavallee)

POTATO

Mr. L.S. McLaine, Chief of the Plant Protection Division, Production Service, kindly supplied the tabulations on the extent of the seed potato industry, the acreages of the leading varieties passing inspection, the extent that fields failed to pass inspection, and the average percentage of the diseases - black leg, leaf roll, and mosaic - found in the fields. All fields entered for certification are planted with certified seed.

Table 4 - Seed Potato Certification: Number of Fields and Acres Inspected, 1939.

Province	Number of Fields		Fields Passed %	Number of Acres		Acres Passed %
	Entered	Passed		Entered	Passed	
P.E.I.	4,482	3,700	82.5	19,945	16,809	84.3
N.S.	652	551	84.5	1,273	1,110	87.2
N.B.	2,982	2,226	74.6	14,189	10,850	76.5
Que.	976	487	49.9	1,418	518	36.5
Ont.	902	675	74.8	2,022	1,422	70.3
Man.	92	26	28.3	184	21	11.4
Sask.	174	131	75.3	277	161	58.1
Alta.	163	122	74.8	249	136	54.6
B.C.	382	283	74.1	729	518	71.1
TOTAL	10,805	8,201	75.9	40,286	31,545	78.3

Acres Entered

1938	38,825
1939	40,286

Increase of 1,461 acres or 3.7%

Acres Passed

1938	27,817
1939	31,545

Increase of 3,728 acres or 13.4%

Table 5 - Seed Potato Certification: Acreages Passed by Varieties, 1939.

Variety	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.-B.C.	Total
Green Mountain	5,637	141	7,069	409	111	71	13,438
Irish Cobbler	10,754	319	439	57	148	29	11,746
Katahdin	193	231	1,537	33	639	1	2,634
Bliss Triumph	209	354	1,721			3	2,287
Netted Gem					6	482	488
Rural New Yorker					285		285
Chippewa	5	1	32		202	9	249
Warba		1	2	1	27	41	72
President		18	23	11			52
Early Ohio						48	48
Early Epicure						31	31
Spaulding Rose	9		19	1			29
Garnet Chili		29					29
Columbia R.						28	28
Gold Nugget					3	23	26
Early Rose		2		3		9	14
Up-to-Date		8				5	13
White Rose						8	8
Other Varieties	2	6	8	3	1	48	68
TOTAL	16,809	1,110	10,850	518	1,422	836	31,545

The acreage entered for certification was again slightly increased, until it was double what it was in 1936, when 20,083 acres were entered. The acreage that has passed inspection has lagged slightly; nevertheless it has increased from 16,739 acres in 1936 to 31,545 acres in 1939. Bacterial ring rot accounted for the rejection of 202 and 130 fields respectively in N.B. and Que., while leaf roll was still high in N.B. where 332 fields were rejected on account of this disease. In most provinces, mosaic was the chief cause of rejection, so that for the Dominion it accounted for 775 or 29.8 of the rejections. Green Mountain and Irish Cobbler are the leading varieties grown, since 25,184 acres of these two passed inspection. However, the acreage of Katahdin was nearly doubled in 1939 and became the third leading variety in place of Bliss Triumph.

LATE BLIGHT (Phytophthora infestans) was found in most of the potato growing areas in the Fraser River Valley, B.C. It was first observed on July 8, but it was not generally prevalent until late July. On the whole, the disease was less prevalent or severe than usual.

Table 6 - Seed Potato Certification: Fields Rejected, 1939

Province	Mosaic	Leaf Roll	Black Leg	Bacterial Ring Rot	Foreign Varieties	Adjacent Diseased Fields	Misc.	Total
P.E.I.	360	31	17	5	140	90	139	782
N.S.	28	17			27	20	9	101
N.B.	112	332	3	202	30	48	29	756
Que.	236	5	2	130	11	31	74	489
Ont.	12	52	9	4	56	22	72	229
Man.	5		2		2		57	66
Sask.	3		7		6	5	22	43
Alta.		5	4	1		1	30	41
B.C.	19	21	10		3	23	23	99
TOTAL	775	463	54	342	275	240	455	2,604
Rejections as a percentage of fields:								
Entered	7.2	4.3	0.5	3.2	2.5	2.2	4.2	24.1
Rejected	29.8	17.8	2.1	13.1	10.5	9.2	17.5	100.0

Table 7 - Seed Potato Certification: Average Percentage of Disease Found in Fields, 1939.

Average percentage of disease found in	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
	%	%	%	%	%	%	%	%	%
Fields intered (first inspection)									
Black Leg	.11	.01	.04	.03	.12	.31	.23	.24	.15
Leaf Roll	.15	.43	1.23	.14	.42	.01	.01	.17	.60
Mosaic	.63	.55	.48	1.64	.08	.29	.09	.03	.65
Fields passed (final inspection)									
Black Leg	.02		.01	.38	.08	.02	.01	.01	.02
Leaf Roll	.05	.12	.16	.23	.15			.04	.11
Mosaic	.12	.15	.14	.53	.03	.08		.01	.10

Most of the crop was harvested in dry weather. However, in certain crops, which were not harvested until after the autumn rains had begun, late blight caused a maximum loss of 10% or an average loss of 1% in all late crops. Early and efficient spraying gave good results.

In experiments conducted at Steveston, 7 different spray materials were applied at the rate of 200 gallons per acre on July 12, July 27, August 12, and August 26. Both early and late blight were kept well in check until September 5. Little tuber rot developed, but the yield was considerably increased by spraying. The unsprayed plot yielded 15.8 tons per acre, while the plots sprayed with Powdered Bordeaux and Micronized

Burgendy yielded 18.9 and 20.8 tons per acre respectively, and those sprayed with the other materials ranged between these values. (H.S. MacLeod)

Although hot weather checked an incipient outbreak of late blight over most of Ont., the disease was severe in the Nippissing and Sault Ste. Marie districts. Considerable tuber rot also developed in Eastern Ontario. (O.W. Lachaine)

Late blight caused some damage throughout Que. The disease was first recorded in the Lake St. John district on July 27, 11 days later than last year. It appeared a few days later near Three Rivers, but it was not until August 24 that it was observed in the lower St. Lawrence. The disease was also found along the north shore of the St. Lawrence from Manicouagan to Havre St. Paul. In some fields where growers had planted their own seed along side certified seed, late blight was severe in the former; it is believed the tubers used for planting were affected by the disease. Late blight rot was more severe near Three Rivers than along the lower part of the St. Lawrence. The benefits of thorough spraying were more evident than usual. Many large fields sprayed 7 times were free from late blight and developed no rot. Most of the fields that were destroyed by blight were sprayed only 3 or 4 times, or in some cases no spray was applied.

Of 976 fields inspected for certification, 41 were rejected for late blight. The highest percentage of tuber infection recorded was 47% in a field which had not been sprayed. The average percentage of tubers infected was 5.7%. (B. Baribeau and C. Perrault)

Late blight was not as severe and widespread in N.B. as in 1938. The disease developed rapidly in the northern half of Carleton and in Victoria, Madawaska, and Restigouche Counties, since favourable conditions prevailed during August and September. However, only a few cases of serious loss from tuber rot were reported. (C.H. Godwin)

Late blight was not general in N.S. in 1939. It was found in Colchester Co. on July 22 and was fairly common by Aug. 17. In Kings Co. the disease was severe only at Scott's Bay. Tuber rot was negligible, except in Colchester Co., where 0.75%, of the crop was rotted. Heavy spraying with bluestone at Scott's Bay just before digging probably helped greatly to prevent rot. (W.K. McCulloch)

Late blight was found at Charlottetown, P.E.I., on July 27 and near Cascumpec on July 29. Both outbreaks were of minor importance and the dry weather for the next month held the disease completely in check. Traces of blight were reported in several fields near Hunter River on Sept. 12, but again a dry period followed, so that no tuber rot nor decrease in yield was noticeable. The damage was the least experienced since 1935. (E.H. Saunders)

RHIZOCTONIA (Corticium Solani (Rhizoctonia Solani) was quite prevalent on the plants in B.C., but in most areas it was of little importance. Only a few crops showed abundant sclerotia on the tubers (H.S. MacLeod). In Alta., sclerotial development was slight on the tubers. However, in one lot of 1200 bu. grown in the Oliver district, 85% of the tubers bore sclerotia (J.W. Marritt). Stem canker was very prevalent and severe at Edmonton, Calgary, Lethbridge, and intermediate points. No other potato disease in Alta. reduces the yield as much. A cool wet planting season, followed by a very dry summer appears to have favoured the disease (G.B. Sanford). A slight development of the sclerotia occurred on the tubers in Sask. Rhizoctonia was not prevalent in Man. and northern Ontario to judge from its presence in the field. (J.W. Scannell)

Rhizoctonia was less prevalent in Que. than in 1938. The average tuber infection was 3.2% in 400 bins (B. Baribeau). Rhizoctonia as a damping off during May and June in N.B. caused a high percentage of misses in fields of Green Mountain and Katahdin. Sclerotia were abundant on tubers harvested late in the season. Four per cent of the crop would be infected (C.H. Godwin). Rhizoctonia was less severe than in 1938, Katahdin in particular showing less. The average percentage of tubers showing sclerotia were about 3.5%. Spongy tubers, which were common in Katahdin on sandy soil, were invariably found attached to plants severely injured, presumably by Rhizoctonia (W.K. McCulloch). Rhizoctonia was particularly severe on Katahdin and less so on Green Mountain in P.E.I. In the former variety the yield of some affected plants has been reduced to two tubers with a total weight of 4 ounces. The tubers show discoloration of the stem end and frequently of the vascular ring; sclerotia also occur on the tubers. (S.G. Peppin)

BLACK LEG (Erwinia phytophthora) was more prevalent than usual in B.C.; it was the cause of rejection of 10 fields and was found in 45 others out of 344 inspected (H.S. MacLeod). From 1 to 4% of the plants were affected in many fields near Edmonton and Lethbridge, Alta. The cool, wet weather in the early season apparently favoured the disease (G.B. Sanford). The disease was more prevalent than usual in fields inspected for certification, particularly in the northern part of the province; 21% were affected. In Sask., black leg was the cause of the rejection of 7 fields and was present in 28 out of 174 inspected; these fields were mostly in the north-eastern section of the province (J.W. Marritt). Black leg was not common in Man.; only 2 fields were rejected on account of this disease. (J.W. Scannell). Black leg decreased slightly from 1938 in Ontario.

Black leg was the cause of rejection of 2 fields out of 976 inspected in Que.; it was relatively scarce, the highest infection recorded was 4% (B. Baribeau). Only 3 fields out 2,928 were rejected for black leg in N.B.; dry weather prevailed during the growing season. The disease continued to decline in N.S.; 10 fields out of 652 were infected. Only a few growers do not regularly treat their seed. (W.K. McCulloch)

EARLY BLIGHT (Alternaria Solani) was severe on tubers from the Cloverdale district, B.C., in April; it was also severe on Sutton's Reliance at Cloverdale in July (W. Jones). In general the disease was not severe except in a few instances, although present both on the coast and in the southern part of the Interior (H.S. MacLeod). A trace of early blight occurred in the plots at Saskatoon, Sask. (T.C. Vanterpool). Early blight was severe in some fields near Port Arthur, Ont.

Early blight was first reported on July 29 in Temiscouata Co., Que.; in general, infection was slight, but it caused the premature death of the plants in some sections. It was more prevalent along the north shore of the St. Lawrence between Clark City and Havre St. Pierre than late blight in late August. A trace of tuber rot was observed at the time of bin inspection (B. Baribeau and C. Perrault). Early blight was prevalent in August in all fields in N.B.; it caused some premature ripening of the plants (C.H. Godwin). A moderate infection of early blight combined with drought reduced yields about 25 bu. per acre in N.S. Only a trace of tuber rot was found (W.K. McCulloch). Early blight varied from a trace to occasionally heavy in P.E.I.; 12 lots of tubers showing rot were brought to the Laboratory. (R. R. Hurst)

BACTERIAL RING ROT (BACTERIAL WILT and ROT) Phytomonas sepedonica). The adoption of the name, Bacterial Ring Rot, in Canada seems to be desirable since it has come to be used widely in the United States. Morover, by calling the disease bacterial wilt and rot, growers associated it with the comparatively mild Fusarium and Verticillium wilts, with which they were familiar. In consequence, it has been difficult to impress upon them the highly infectious and destructive nature of the disease. (I.L. Conners)

Bacterial ring rot has not been found in B.C.; one suspected case proved to be negative upon microscopic examination by Dr. W. Newton (H.S. MacLeod). An extensive survey for the disease was made in 1939 in Alberta by the Provincial Department of Agriculture in co-operation with the University. The principal potato growing areas south of township 33, and west of range 5 of the 4th meridian were visited, during which time, 680 fields of all sizes selected at random were examined. The disease was located in 12 townships in the irrigated districts of southern Alberta, including the districts of Lethbridge, Coalhurst, Coaldale, Raymond, Taber and Retlaw. The severest infections were found in early varieties and in early planted fields of Netted Gem, but little or no disease was identified with certainty in late planted or late maturing fields. Approximately 200 tons of potatoes showed 1% to 10% of the disease at the time of inspection. In addition some 800 tons showed a trace or were suspected of being infected. Some of these stocks may have been free. On the other hand, because of the difficulty of detecting traces of the disease, it may have been present in stocks where none was reported.

Although bacterial ring rot was not recognized until 1937 in Alberta, there is evidence that it has been present for several years on certain farms in the Lethbridge district. Potatoes constitute an important part of field production on many farms in the irrigated districts. About 200 carloads are exported annually by Lethbridge wholesale houses. The presence, therefore, of bacterial ring rot in this area is of considerable economic importance (O.S. Longman). The disease was found in one field out of 163 inspected for certification in Alberta; the seed had been imported last spring (J.W. Marritt). Bacterial ring rot was found in two fields at Birds Hill, Man., at digging time. These fields consisted of 26 acres of Irish Cobbler and 9 acres of Chippewa respectively and had been previously rejected on account of Fusarium wilt. The diagnosis was confirmed by Dr. W.A.F. Hagborg. (J.W. Scannell)

Bacterial ring rot was found on nine farms in Ontario, seven being in the Alliston district. On four of these seven, the disease was found last year. Instead of getting rid of their contaminated stock as advised, the growers had attempted to select healthy tubers from it. Infection ranged from 7 to 25%. Growers who obtained clean seed and had disinfected their equipment appear to have eliminated the trouble. Where a picker planter was used to plant diseased seed and then a lot of clean seed, it transmitted the disease to the clean seed, but the infected plants were mostly concentrated in the first few rows. The disease was found for the first time in Eastern Ontario; it appeared to have been introduced in 1938 seed obtained from P.E.I. (O.W. Lachaine). Bacterial ring rot was found in 130 fields out of 976 entered for certification in Quebec. The disease was also present in many commercial fields and in some fields 25% of the crop was unfit for sale on account of the rot. Some evidence of spread of bacterial ring rot by a picker planter was obtained at two widely separated districts in the province (B. Baribeau). To judge by the number of diseased specimens received at the Laboratory, bacterial ring rot is widespread in Quebec. Experiments have shown that the knife is a most important agent of transmitting the disease from diseased to healthy tubers. The planter is also capable of spreading the disease to a certain extent, and disinfection of a contaminated machine with strong formaldehyde did not give quite 100% control. All white varieties so far tested have proven equally susceptible, but among the red varieties Rural Blush has shown considerable resistance in the past two years. (C. Perrault)

Bacterial ring rot was found in 202 fields in N.B. this season, compared to 81 in 1938, and has been found in all important seed producing areas in N.B. All varieties commonly grown have been found to be infected (C.H. Godwin). The disease was found in N.S. for the first time at Glenmont, in a field of White Rose; the seed came apparently from North Dakota via St. John, N.B. (W.K. McCulloch). Bacterial ring rot was found on 13 farms in P.E.I. These fields were: 2 of certified Irish Cobbler at Monticello, 0.6% infection; 2 of certified Katahdin of the same stock, Freetown, 10% infection; and 9 of table stock Green Mountain in an area

about New London, Long River and Hope River. Infected stock was from one source, and practically all stock sold from this source in the past 3 or 4 years was infected. The diseased lots were consigned to a starch factory. (Geo. W. Ayers)

Bacterial ring rot has now been found in at least one place in 27 of the 48 States of the United States. These States are as follows: Me., Mass., N.Y., Penna., N.J., Md., N.C., S.C., Fl., Ala., La., Ohio, W.Va., Ky., Mich., Wisc., Minn., Iowa, N.D., Nebr., Mont., Wyo., Utah, Colo., Idaho, Oreg., and Calif., according to a letter received from Dr. J.G. Leach, on January 9. The prevalence of the disease varies greatly in the individual States. (I.L. Conners)

FUSARIUM WILT (F. sp.) affected 18% of the fields inspected in B.C. in 1939 as compared to 13% the previous year, but no fields were rejected (H.S. MacLeod). Eleven out of 174 fields were rejected in Sask. on account of wilt and 8 others showed a trace to 1%; the disease was more prevalent than previously (J.W. Marritt). The disease was widespread in Man. in 1939. It was present in 69 out of 92 fields inspected, and the percentage of diseased plants varied from 0.3 to 12.6%. The weather was hot and dry in July, followed by showers nearly every day and high relative humidity in August. All fields of table stock showed a great deal of wilt in late summer. (J.W. Scannell)

VERTICILLIUM WILT (V. sp.) caused moderate damage in one garden in Edmonton, Alta. (G.B. Sanford). It was more in evidence in P.E.I. in 1939 than in any previous year due to favourable climatic conditions for its detection and to the absence of early and late blight. In all 67 fields were rejected for wilt on account of the infection exceeding 1%; 44 fields were in Prince Co., and the other 23 in Queens, with no cases in Kings. The increase in the number of fields reported affected with wilt is probably due to factors mentioned above, to the use of diseased stock and, to a limited extent, to spread from contaminated soil to healthy stocks. The disease has been greatly reduced by treating the cut sets with Semesan Bel, 2 lb. in 15 gal. of water; in a preliminary experiment the percentage of wilted plants was reduced from 58.9% in untreated diseased seed to 12.5% in the treated, while untreated healthy seed showed 2.2%. The yield was also improved by treatment. These results confirm the observations of one of the potato inspectors, on the value of seed treatment. (G.W. Ayers)

STEM-END ROT (Fusarium Solani var. eumartii) was much less important in 1939 than the previous year in Ont., due to the fact that a large number of growers replaced their diseased seed with sound material. There are, however, many table stock growers still planting diseased seed. The worst centre is about Mount Albert (O.W. Lachaine). The presence of stem-end rot was established in several fields in the Alliston and Everett districts. The disease is mostly confined to fields where growers plant their own, undoubtedly contaminated seed instead of securing fresh seed,

known to be free from the disease. Soil contamination was not a factor as a fairly long rotation is already practised. (D.B.O. Savile)

WILT (cause undetermined) was reported again in small amount in Colchester Co., N.S.

STORAGE ROTS were prevalent and often severe in Alberta in the winter 1938-39. Several pathogenic fungi were isolated, the most common being Fusarium caeruleum, F. sambucinum f. 6 and Pythium ultimum. Severe rotting in storage was caused by Erwinia phytophthora following black leg damage in the field at St. Albert. Storage rot due to Fusarium spp. was reported from Madison, Sask. Two cases of storage rot were investigated in Man.; odd tubers were infected. Fusarium sambucinum f. 6 was isolated from Winnipeg material, and F. Solani from Birds Hill. (W.L. Gordon)

COMMON SCAB (Actinomyces scabies) was found on potatoes in only a few areas in B.C., and the infection was usually slight (H.S. MacLeod). Scab was more severe than usual in Alberta on smooth skinned varieties. In Saskatchewan over 50% of the tubers on the average were affected by scab, and after grading about a quarter of the lots inspected showed too much scab to pass certification standards (J.W. Marritt). It was less common than usual in Man. and northwestern Ont. Common scab was not serious in Que. this year. Infection ranged from a trace to 4% upon bin insection and averaged 1.6% (B. Baribeau). The average infection in N.B. was 2% of the tubers.

Scab was widely distributed in N.S.; the average infection was 2.5%. About 20% of the crops were clean, but one crop of Katahdin showed 45% of scab (W.K. McCulloch). Scab was plentiful in P.E.I. making it difficult to grade the crop. (R.R. Hurst)

POWDERY SCAB (Spongospora subterranea) was found in several fields in the Fraser River Valley, B.C., and in the Ladysmith district, Vancouver Island. Infection ranged from very slight in Netted Gem to very severe (75% of tubers) in White Rose (H.S. MacLeod). Powdery scab was found in a few lots of seed potatoes in Que. It was less evident than last year in N.B. Powdery scab was found in 7 fields in Kings Co., N.S. and 2.2% of the tubers were affected; it was much less common than in 1938. A trace was observed in one lot of tubers in P.E.I.

SKIN SPOT (Oospora pustulans). A slight infection was found at Edmonton, Alta.; the pathogen was identified by Dr. Gussow. (G.B. Sanford)

SILVER SCURF (Spondylocladium atrovirens). In two lots of Irish Cobbler, 10% of tubers had to be discarded when the seed was graded for certification; otherwise the disease was unimportant in B.C. Silver scurf was noticed in a few lots in Que., N.S., and P.E.I.

STEM-END HARD ROT (Phomopsis tuberivora). A few affected tubers were noticed on Lulu Island, B.C. (E.R. Bewell)

LEAF ROLL (virus) was found in 171 fields in B.C. and caused the rejection of 21. This is an increase over 1938 (H.S. MacLeod). The disease was prevalent in suburban gardens of Edmonton and Calgary, Alta., and the 3 fields rejected for leaf roll were similarly grown near Edmonton. Only a trace of leaf roll was seen in Sask. (J.W. Marritt). Leaf roll was again almost absent from Man. (J.W. Scannell)

The hot dry summer of 1938 apparently favoured the spread of leaf roll in Ont.; 52 fields were rejected in 1939 as compared to 12 in 1938 and the percentage of infection was trebled (O.W. Lachaine). Leaf roll was recorded in 274 fields out of 976 inspected in Que. and caused the rejection of 5. An increase of the disease is anticipated in 1940, since Myzus persicae was comparatively abundant in 1939 (B. Baribeau). Leaf roll was still prevalent but not as serious as in 1938 in N.B. The disease was mostly concentrated in York, Carleton, and Victoria counties; in one area the average infection in 100 fields fell from 16.6% in 1938 to 9% in 1939. Leaf roll was reported in 52% of the fields inspected in N.S., and caused the rejection of 2.6%; in one field of Chippewa 21% of the plants were affected (W.K. McCulloch). Considerable more leaf roll was found in P.E.I. than in any previous year. (S.G. Peppin)

MOSAIC (virus) was found in 201 fields in B.C. and 19 fields were rejected; it was more prevalent than in 1938. The disease was again common in gardens in Edmonton and Calgary, Alta. Mosaic was found in only 5 fields in Sask. Mosaic was prevalent in Man., and 5 fields and several plots were rejected. Mosaic was common but slightly less prevalent in Ont. than in 1938. In Que., 236 fields were rejected on account of mosaic; infection ranged from a trace to 20%. In N.B., 112 fields were rejected; the symptoms were obscure this year. Mosaic was found in 56% of the fields inspected and caused the rejection of 4.3% in N.S.

GIANT HILL (virus suspected) was found in 50% of the fields inspected in B.C., but none were rejected on account of its presence. It is very difficult to control the trouble satisfactorily even by the most careful selection of the stock for a tuber unit seed plot and thorough roguing (H.S. MacLeod). Giant hill was found in an 8-acre field of Early Ohio near Winnipeg, Man. This is the first time the trouble has been noted in Man. (J.W. Scannell). Traces were found in fields of Green Mountain in N.B.; use of seed free from the condition has reduced the number of fields reported (C.H. Godwin). A trace was present in a few fields of Green Mountain in Kings Co., N.S.

SPINDLE TUBER (virus) was rare in Man. and northwestern Ont. A trace to 0.6% occurred in 44 fields out of 976 inspected in Que.; the disease is general in table stock, up to 10% of the plants being affected. Spindle tuber was not so conspicuous as last year in N.B. due to the better quality of the seed being used, particularly the Katahdin variety; 4 fields were

rejected. The trouble was found in 2 fields of Irish Cobbler in N.S. Spindle tuber was noted in 25 fields of table stock in P.E.I.; a trace to 5% of the plants were affected.

WITCHES' BROOM (virus) affected a trace to 2% of the plants in 38 fields inspected in B.C. Two plants were found affected in a field in P.E.I.

YELLOW DWARF (virus) increased somewhat, particularly in the Caradoc district, Ont.; 14 fields were rejected this year against 5 fields last year. Yellow dwarf affected 25% of the plants of Sebago and 1% of Arran Consul at Ste. Arsene, Que.; a clover field was growing 400 feet from the potatoes. The Sebago planting was one of 21 lots scattered across Canada all from the same seed; all other plantings were free from the disease. Yellow dwarf was also reported in B.C. and Alta.

The vector of yellow dwarf, Aceratagallia sanguinolenta, is represented in the National Entomological Collection by specimens from several localities in Ont. and Que., by a few specimens from Man. and a series from Saskatoon, Sask., on alfalfa. Two collections from B.C. are referred here with some doubt. It appears that this leaf hopper is widespread and occurs in comparative abundance throughout the agricultural areas of eastern North America. There are no records of an epidemic or near epidemic in Canada unless the Saskatoon report might be so considered. (H.G. Crawford)

PSYLLID YELLOWS. Severely affected plants were seen in vacant plots near Calgary and at Medicine Hat, Alta., and definitely affected plants were recorded at Olds and Brooks. The disease was not general as it was last year (J.W. Marritt).

Severe net necrosis of the tubers with the characteristic distortion and abnormal pigmentation of the vines was observed again at Medicine Hat, Calgary and Lethbridge. At Lethbridge and in a section of Calgary all the tubers in the affected plantings were severely netted and unfit for sale or table use. At Lethbridge the outbreak, contrary to the previous season, was local in nature. However, heavy losses were incurred by those, who, contrary to advice, used affected 1938 stock for seed. Some fields were plowed up early, while others showed a high percentage of misses and many weak and backward plants. The monetary loss is estimated to be double that of 1938. Present experimental and observation evidence is that the necrosis was initiated by the tomato psyllid (Paratrioza cockerelli). Moreover, it appears that under conditions in Alberta a characteristic netting of the tubers, discoloration of the vascular region of the tubers and stem, and the destruction of the cortical area of stolons and roots are constant symptoms produced by the attack of these insects (G.B. Sanford). Psyllid yellows was not observed in Saskatchewan.

The potato and tomato psyllid, Paratrioza cockerelli Sulc, was present over the greater part of Alta. and Sask. from the International Boundary

north to Edmonton, Alta., and Melford, Sask., in 1939. Approximately the same area was infested in 1938, but there was a marked reduction in population this year. A survey through the Crow's Nest Pass as far west as Cranbrook, B.C., showed no P. cockerelli west of Cowley, Alta., where a trace was found.

Loss from psyllid yellows was limited to local areas, particularly near infested greenhouses. In these greenhouses and in nearby plots of tomatoes and potatoes, the loss was equal to that of 1938, in many cases approaching 100%. (G.F. Manson)

PURPLE TOP (cause unknown) was found in 16% of the fields inspected in Alta. and 2 fields were rejected. In one field of table stock at Pouce Coupe, B.C., 75% of the plants were affected (J.W. Marritt). So-called purple top was found in many plantings throughout Alberta with an average of about 1% of the plants affected (G.B. Sanford). In Sask., 6% of the fields inspected were affected and one was rejected due to the disease (J.W. Marritt). One field of Netted Gem at Brandon, Man., was rejected on account of purple top. The seed used was from a field that was perfectly healthy in 1938. The disease began to show up as soon as the crop came up according to the growers. In general less purple top was observed than in the previous year (J.W. Scannell). A disease referred to as purple top has been found in Katahdin, in N.B. and P.E.I. (See special section on virus diseases by D.J. MacLeod).

PEPPER SPOT (cause unknown) was first recognized in 1938. This year it was observed in several lots in west and north Edmonton, Alta. It is characterized by many small, superficial black spots observable on both sides of the terminal leaves; more or less chlorosis, and later well marked brown pulpy streaks in the vascular area of the stems. The streaks begin at the upper nodes. The disease is apparently not of a virus nature, but is due to mineral unbalance or concentration in the soil. (G.B. Sanford)

NET NECROSIS (cause unknown). The disease so designated was found in a large number of potato fields in southern Alberta. Damage was exceptionally severe at Medicine Hat and Calgary. In Medicine Hat 100%, of the tubers were affected in several fields (A.W. Henry). The germination of tubers from 5 lots of certified 1938 seed was tested. These lots showed no more net necrosis than is permitted by the regulations, i.e. not over 4% of the tubers affected. Many eyes failed to grow, or weak spindling sprouts developed with an abnormal amount of roots. A survey in June showed that the planting of affected seed had resulted in many extremely poor stands, the returns from which would not pay for further cultivation (G.B. Sanford). While net necrosis and psyllid yellows may be different expressions of one and the same trouble, the two diseases are reported separately, here.

Net necrosis was much more prevalent than usual in B.C., the trouble varying from a trace to quite severe. Several fields were rejected for

certification and there were complaints of its occurrence in several shipments of table stock potatoes. The necrosis was of several types and the amount present in any field varied with the location in the field (H.S. MacLeod). Traces were seen in Sask.

Samples of tubers showing stem-end browning and net necrosis were planted in 1939; 85% of plants developed leaf roll (B. Baribeau). Net necrosis was found in all seed in the Keswick area, N.B., during shipping inspections (C.H. Godwin). Traces were seen in Prince and Queens counties, P.E.I.

DEEP STEM-END BROWNING (cause unknown) was also observed in Keswick area, N.B. It was seen occasionally in P.E.I.

HOLLOW HEART (non-parasitic). Several specimens were received at the Laboratory, Charlottetown, P.E.I.

FROST INJURY. A frost caused slight damage to potatoes in the Lake St. John district, Que., on June 17. A trace of damage was observed in October in the Lake St. John district and L'Islet Co.; and severe damage in Matapedia Co. (B. Baribeau). Traces were found on bin inspection in Prince and Queens Counties, P.E.I. (R.R. Hurst)

FLEA BEETLES caused some injury to the foliage in the southern districts of B.C., but tuber injury was not observed (H.S. MacLeod). There was a severe outbreak of flea beetles in P.E.I. in 1939. (R.R. Hurst)

SPINDLING SPROUT affected a trace to 15% of the tubers. Many of the plants from such tubers were weak and failed to develop or were affected by virus diseases.

BLIND TUBER (non parasitic). In affected sets, the eye fails to develop a normal stalk, forming a small tuber at the eye or fleshy tuberances develop anywhere on the surface of the set. In N.B. the condition is usually associated with unfavourable weather conditions following planting. High storage temperatures and high temperatures during tuber maturation are also said to have unfavourable influence. The trouble was unusually prevalent in 1939 and was responsible to some extent for missing hills, especially in areas where potatoes were planted very early and exposed later to cold wet weather. (J.L. Howatt)

SEED-PIECE DECAY (Pythium de Baryanum). Four lots of seed planted in pots in the greenhouse, Kentville, N.S., about December 1, showed 93%, 92%, 66% and 24% of seed-piece decay, respectively, on December 21. The organism was isolated. The soil in the pots was wet and cool. Later plantings in drier soil were not affected (K.A. Harrison). Seed-piece decay was responsible for many poor stands in P.E.I. (R.R. Hurst)

STEM ROT (Sclerotinia sclerotiorum) was found affecting 2% of the plants of Netted Gem near Ladner, B.C. The pathogen was identified by Dr. Drayton. This is the first time the disease was found in B.C. (H.S. MacLeod). In a crop of White Rose at Cloverdale, over 10% of the plants were affected (W. Newton). The disease affected 1% of the plants in a quarter acre of Houma in Kings Co., N.S. (P.E. Donat)

GREY MOULD (Botrytis cinerea) was observed as a stem rot in several fields in Que. towards the end of the season. Usually the stem was attacked at the base of the leaves, which turn yellow and dry up (C. Perrault). Infection was a trace to slight on the older leaves in a field of Green Mountains in Kings County, N.S. (J.F. Hockey)

CURLY TOP (virus) was found affecting scattered plants in the Okanagan Valley, and the boundary districts of the Interior of B.C. This is the first Canadian report of its occurrence on potato. The symptoms are an upward rolling of the leaves, aerial tubers, and an abundance of small tubers below ground. Tomatoes and redroot pigweed affected by curly top were found growing in close proximity to the infected potato plantations. The identity of the disease was unknown but when the symptoms were described to Dr. Leon K. Jones, Wash. Agr. Exp. Station, Pullman, Wash., on his visit to the Laboratory this fall, he suggested that the trouble was curly top. The diseased plants were collected by Mr. E.R. Bewell and Mr. W. Touzeau (W. Newton). Curly top appears to be fairly prevalent and destructive in the vicinity of Pullman on Katahdin, Chippewa, and a number of seedling strains that have Katahdin as a parent. The disease does appear on the Russet Burbank variety at times, but the symptoms are not as pronounced on this variety as they are on the above mentioned varieties, which contain a colour factor. On Russet Burbank the disease can be readily confused with extreme Rhizoctonia root and stem injury (L.K. Jones). The insect vector, Euttetix tenellus, is unrepresented in the National Entomological Collection. (C.R. Twinn)

SOFT ROT (Pythium ultimum) was found in 3 fields at Grand Forks, B.C., and also a shipment of potatoes from Kamloops to Calgary, Alta. (W. Jones & E.R. Bewell)

EELWORM (Heterodera marioni) was found in 2% of the tubers in storage at Sooke, B.C. (W.R. Foster)

BLACK DOT (Colletotrichum atramentarium) was fairly common on Green Mountain in October in Queens Co., P.E.I. (R.R. Hurst)

SUN SCALD (non-parasitic) affected a trace to 5% of the tubers in some localities in P.E.I. Soil temperatures were in some cases as high as 98°F. (R.R. Hurst)

RADISH

CLUB ROOT (Plasmodiophora Brassicae) affected 2% of the radishes in a garden at Charlottetown, P.E.I.

BROWN HEART (boron deficiency) caused slight to moderate damage to radish in a garden in Queens Co., P.E.I.

PROLIFERATION (cause unknown) affected about 70% of the plants in three lots of Scarlet Globe being grown for seed at Summerland, B.C. Affected plants failed to produce seed, except a few of the earliest formed pods. (T.B. Lott)

RHUBARB

CROWN ROT (cause unknown). Traces were recorded at Rosthern, Melfort, Saskatoon, Sask.; and in Queens Co., P.E.I.

LEAF SPOT (Ascochyta Rhei) was moderate in a garden at Edmonton, Alta.; slight on some plants at Brandon and Morden, Man.; severe in Queens Co., P.E.I.

LEAF SPOT (Phyllosticta straminella) was moderate on a new variety at Kentville, N.S. (D.W. Creelman)

ANTHRACNOSE (Colletotrichum erumpens) was moderate to severe at Kentville, N.S.; in a lot of Early Sunrise set this spring, 62% of the foliage was dead or dying on August 4. (K.A. Harrison)

SALSIFY

WHITE RUST (Cystopus cubicus). In a garden in Saskatoon, Sask., a large salsify plot was severely infected by white rust in mid-season, but the roots developed quite well in spite of every leaf being infected (T.C. Vanterpool). A trace was seen in one field at St. Leonard - Port Maurice, Que. (E. Lavalle)

SPINACH

DOWNY MILDEW (Peronospora Spinaciae) was general in one garden at Sidney, B.C. (J. Bosher). It caused slight damage in one garden in Saskatoon, Sask., but was absent from another (T.C. Vanterpool). Downy mildew was observed in many fields in Laval Co., Que., but it caused no serious damage. (E. Lavallee)

WILT (Fusarium redolens f. 1 Wr.) affected 80-100% of Bloomsdale Long Standing plants in a plot for seed at Grand Forks, B.C. The disease

develops during the hot weather in summer and kills the plants shortly before the seed begins to mature. Isolations were compared with authentic cultures and the two appeared identical. (G.E. Woolliams)

SWEET CORN

SMUT (Ustilago Zeae). A specimen was received from Shellbrook, Sask. Smut was of no economic importance in the Niagara Peninsula and Western Ont. except in isolated fields where no crop rotation is followed or cultural practices are careless (J.K. Richardson). Smut is commonly seen in sweet corn in the Montreal district, Que., but the loss is always slight. (E. Lavallee)

SEED DISCOLORATION (Fusarium sp.). A sample from the Seed Laboratory, Vancouver, B.C., showed pale brown areas on the seed, chiefly around the germ end. A Fusarium was isolated. (W.R. Foster)

TOBACCO

The tobacco disease report presented below was prepared by Dr. G.H. Berkeley from notes gathered by himself or supplied to him by Mr. P.G. Newell, St. Catharines, Ont.; Dr. L.W. Koch and Mr. R.J. Haslam, Harrow, Ont.; Mr. F.A. Stinson, Delhi, Ont.; Mr. R.J. Stallwood, Tillsonburg, Ont.; Mr. G.E. Turcotte, L'Assomption, Que.; and Mr. R. Bordeleau, Farnham, Que.

Diseases in the Seedbed

DAMPING-OFF (Rhizoctonia sp. and Pythium sp.) was present in the majority of seedbeds in both the old and new districts of Ontario and to a lesser extent in Quebec. Though the disease was generally confined to small patches in most beds, several cases were observed where large areas were affected. In several beds, damping-off was so severe that it became necessary to reseed. Damping-off appeared early and caused considerable damage at the time the seedlings were emerging from the soil. Again, at transplanting time, damping-off was a factor of considerable importance. A few growers found it necessary to buy plants because of the severity of damping-off in their seedbeds.

BLACK LEG (?Erwinia Aroideae). In the old belt, black leg was more prevalent than in 1938, as it was present to some extent in most beds by transplanting time. In the new belt, black leg was observed in only seven greenhouses. Appreciable loss of plants occurred in only two beds.

BLACK ROOT ROT (Thielaviopsis basicola) was more general than ever before in seedbeds in the new belt. Of 134 beds examined, black root rot was found in 62. In eighteen cases, the disease was so general that all the plants had to be discarded. In the old belt, black root rot was observed

in 28 beds. Most cases developed late in the seedbed stage and consequently damage was not severe.

YELLOW PATCH (cause unknown) was not as prevalent in the new belt as it was in 1938. In the majority of cases, the plants outgrew the early stunting caused by this trouble. In the old belt, yellow patch occurred in several localities, particularly in beds where large quantities of fresh muck were used.

BLUE MOULD or DOWNY MILDEW (Peronospora tabacina) appeared for the second consecutive year in Essex county, Ont., in eight seedbeds and two fields. The fact that the disease first appeared in seedbeds where it had developed last year indicates that it was able to overwinter under Ontario conditions.

GRAY MOULD (Botrytis sp.). In the new belt, gray mould occurred in a small patch in one seedbed. Large necrotic spots were formed on the lower leaves, and lesions extended from one to four inches up the stem. The characteristic conidiophores were present. This is apparently the first report in Canada of gray mould as a seedbed disease.

Diseases in the Field

MOSAIC (virus) was more prevalent than last year in both the old and new belts of Ontario and in the northern district in Quebec, while in the southern district in Quebec it was about the same as in 1938. It was again observed that the great majority of cases of high infection were in fields which had been planted to tobacco the year previous. During the early part of the season, mosaic was not so much in evidence, but following the rains in August, it became widespread with many fields showing a high infection. A few cases were observed where infection ranged between 70% to 90%. Counts made in 62 fields gave an average of 10.6%, as compared with 3.5% average in 100 fields last year. In 24 fields where tobacco followed tobacco, the average percentage of mosaic was 28.2%, whereas it was only 1.8% in 33 fields where rye preceded tobacco. Mosaic was more general in the flue-cured district of Quebec than it was in the cigar-leaf and pipe tobacco district.

RING SPOT (virus) was observed on isolated plants in a number of fields in various sections of the new belt. Ring spot was prevalent in the old belt, causing appreciable damage in some cases.

STREAK (virus). This disease was reported last year under the heading "A virus disease new to Ontario". Since then, investigations have indicated that this new disease is tobacco streak, as described by J. Johnson in 1935. This year, it was encountered in both the old and new districts in Ontario and in the northern district in Quebec. Kelley was again the variety most severely affected. However, streak was not so widespread as in 1938 and caused much less damage. In most fields, only a few affected plants appeared scattered here and there in the field.

BLACK ROOT ROT (Thielaviopsis basicola) was more prevalent in the new belt in Ontario than ever before. It was responsible for some of the unevenness of stand that was apparent in the early season. On the whole, however, the importance of black root rot lay in checking the growth in the earlier part of the season, with a consequent delay in maturity. Instances of severe reduction in yield were not numerous. A root-rot survey made in 126 fields indicated that root rot was present in 43 fields (34.1%) and absent in 83 (65.9%). Of the 43 fields affected with root rot, black root rot was present in 28 (65.1%), brown root rot in 11 (25.6%) and both brown root rot and black root rot in 4 fields (9.3%). Due to favourable harvesting conditions continuing later into the season than usual, the later-maturing, root-rot affected crops were, for the most part, satisfactorily harvested. Losses from root rot were accordingly not as great as they might have been had frosts occurred earlier.

In the old belt, the disease caused much less damage than in 1938. Though numerous fields were midly affected, favourable weather toward the end of the season favoured recovery, with the result that there was little serious damage.

Black root rot was the most prevalent disease in the northern district of Quebec this season, though it did not reduce the crop yield to any appreciable extent. In the southern district, black root rot was less prevalent than in 1938 and only a few fields were adversely affected.

BROWN ROOT ROT (Cause unknown). In the new belt, brown root rot was observed in 15 fields (11.9%) out of 126 examined. Of these 15 cases and seven additional fields encountered in the district, seven followed corn, seven followed tobacco, four followed sod, and the rotation in four is unknown. It should be pointed out that in the seven cases following tobacco, corn may have been a factor in the manure, or in the 1937 rotation. Brown root rot was found on the following varieties: Yellow Mammoth (12), White Mammoth (3), Gold Dollar (1), White Stem Orinoco (1) and unknown in 5 cases.

In the old belt, 38 cases of brown root rot were observed, 26 of which occurred in soil which had had corn, or corn refuse, added to it in 1937 or 1938. In 22 cases the Burley variety infected was Harrow Velvet, while in 7 cases it was Halley's Special. In one field where Kelley was replanted in several rows of Harrow Velvet, the Kelley plants became several times the size of the nearby Harrow Velvet plants. Of the flue-cured varieties, Yellow Mammoth was the most severely attacked. Brown root rot was present in the district to about the same extent as last year. Although brown root rot was quite serious during the early growth period, a large percentage of mildly affected fields recovered to make fairly normal growth towards the end of the season. However, severely affected fields did not recover, resulting in serious losses to the grower.

FRENCHING (Non-parasitic). This disease was much less prevalent than in 1938. Out of 126 fields examined in the new belt, only 12 or 9.5% showed frenching. Only a few cases of extreme frenching were noted. In the old belt, six cases of frenching were observed, all on imperfectly drained fields.

ANGULAR LEAF SPOT (Phytomonas angulata). In the new belt, angular leaf spot was not so prevalent as it was in 1938. In fact, it was observed on only a few plants in three fields. In the old belt, however, mild outbreaks of this disease occurred towards the end of the season in the Gest, Wheatley, and Tilbury districts, where it could be found in practically every field by the end of August. In the two Quebec districts, this disease became prevalent towards the end of the season, following rains in August.

LEAF SPOTS (non-parasitic) were much less prevalent than last season in both Ontario and Quebec. Where it did occur, it appeared to be associated with poorly drained soils.

HOLLOW-STALK (?Erwinia Aroideae). Only a few cases were reported in Quebec.

SORE-SHIN (Rhizoctonia Solani) was more prevalent in the new belt than in 1938. Many fields throughout the district contained several sore-shin plants. It was of no importance, however. Not reported from other districts.

NEMATODES (Heterodera marioni) were found on tobacco roots in six fields in the new belt. In five fields, only a few plants were affected. In the sixth field, where tobacco followed potatoes and field peas, the infection was general.

WILT (cause undetermined). A wilt corresponding in many respects to that caused by Fusarium oxysporum was observed in both the old and new belts in Ontario. A Fusarium sp. has been isolated, but its pathogenicity has not as yet been tested. This wilt was observed on plants in widely separated districts. Single leaves or several leaves or one side of a plant were affected. Necrosis of water-conducting tissues was observed in affected leaves. Wilt was observed in flue-cured, Burley, and dark types.

UNEVEN RIPENING. This condition was observed again this season in the new belt, but was less abundant than in 1938.

MAGNESIUM DEFICIENCY was more in evidence in the new belt than in 1938.

POTASH DEFICIENCY occurred in all districts in about the same proportions as in 1938.

LIGHTNING. Several cases of lightning injury were reported.

TOMATO

BLOSSOM-END ROT (non-parasitic) was frequent in gardens about Victoria, B.C. Damage by blossom-end rot was reported from the greenhouses at Oliver, Alta. The trouble was general and severe at Morden, Man. Blossom-end rot was observed in many parts of Ontario. In some cases, 20% of the fruit were being destroyed (J.E. Howitt). No severe cases were seen in the Montreal district, Que. Traces of blossom-end rot were seen in gardens throughout P.E.I., but it was of little importance.

MOSAIC (virus). There was considerable less mosaic, or streak, than in previous years about Victoria, B.C. (W.R. Foster). Mosaic was present in practically all greenhouse tomatoes in the Okanagan district; the average loss was not over 1% (G.E. Woolliams). Mosaic affected 3% of the plants of one variety in a 6-acre field inspected for seed at Brighton, Ont. It also affected 15% of the plants in a seed plot at St. Catharines (G.E. Chamberlain). Traces of mosaic were found in 2 fields at St. Jean and Boucherville, Que., but it is known to be much more common (E. Lavallee). Mosaic was observed in 5 gardens about Charlottetown, P.E.I.

SPOTTED WILT (virus) caused slight damage in greenhouses at Medicine Hat and Edmonton, Alta.

YELLOWS (virus) appeared in most fields at Summerland, B.C., but it was not very prevalent (G.E. Woolliams). Yellows, due to the virus causing curly top of beets is present every year on tomato in the Okanagan district, but varies greatly in severity. This year it was noticed on Hubbard squash in the Grand Forks area. (H.R. McLarty)

LEAF MOULD (Cladosporium fulvum) caused 20-25% loss in a few greenhouses about Victoria, B.C., due largely to neglect of proper ventilation (W.R. Foster). The disease was found in most commercial greenhouses in the Okanagan district; as a rule the losses are slight and take place mostly at the end of the picking season (G.E. Woolliams). Leaf mould infection was heavy in a greenhouse in Lincoln Co., Ont., in March, 1939. The mould resistant variety, "Vetamold", was outstandingly resistant (G.C. Chamberlain). An outbreak of leaf mould occurred on the late tomato crop in late August and early September in Essex and Kent counties. By Sept. 15, the disease was found in every plantation. It caused some defoliation, but the attack came too late to cause appreciable damage. All crops in the Harrow district in November were suffering from leaf mould, resulting in a shortening of the picking period in many greenhouses (L.W. Koch). A few affected leaves were received from River Herbert, N.S. (D.W. Creelman). Two cases of leaf mould were reported in P.E.I. (R.R. Hurst)

EARLY BLIGHT (Alternaria Solani). A trace was reported on New York State at Morden, Man. Many early tomato crops were entirely ruined in Essex Co., Ont., before the crops were half harvested, in spite of the comparatively dry weather early in the season. Septoria Lycopersici was also present, making it difficult to estimate which organism was causing the greater damage. Early blight caused considerable defoliation in Lincoln Co., but the damage was slight (J.K. Richardson). Early blight caused severe defoliation at Kentville, N.S. The disease was moderate and apparently caused little damage at Charlottetown, P.E.I.

SEPTORIA LEAF SPOT (S. Lycopersici) was less severe than in 1938 on the early tomato crop in the Essex and Kent Counties, Ont.; the disease was widespread, but generally mild. On the late crop this leaf spot became moderately severe in August in a few localities in Kent Co. (L.W. Koch). Septoria leaf spot was present in most of the 10 fields visited in the Montreal district, Que., although the affected plants were partially defoliated, the infection came too late to cause serious damage. (E. Lavallee)

VERTICILLIUM WILT (V. sp.). A slight amount of wilt was found in a few greenhouses in the Victoria district, B.C. Many growers sterilize their soil, thus reducing chances of infection. (W.R. Foster)

FUSARIUM WILT (F. Lycopersici) had affected about 50% of the plants in a greenhouse at Macdonald College, Que., on Dec. 4. It is probably common and quite destructive late in the season. (I.H. Crowell)

PHYTOPHTHORA ROT (P. Cactorum) was observed in a greenhouse at Freeman, Ont. Nearly all the fruits on the lower trusses showed the characteristic brown rot. When the fruits were placed in a moist chamber the conidiophores and conidia developed in abundance. Diseased material was sent to Dr. Donald Reddick, who reports that the organism was isolated and identified to be Phytophthora Cactorum. Two or three other lots of tomatoes affected by this rot were received this year, and in 1935, specimens were received from London, Ont. (J.E. Howitt)

GREY MOULD (Botrytis cinerea) caused heavy losses in several cars of fall crops shipped from B.C. to eastern points. (W.R. Foster)

TIMBER ROT (Sclerotinia sclerotiorum) was found affecting 1% of the plants in a greenhouse in May in Lincoln Co., Ont.; the soil was excessively moist and heavily manured. (G.C. Chamberlain)

NAILHEAD (Macrosporium tomato) was present on the early tomato crop in many plantations in Essex Co., Ont.; the damage was slight. One plantation showed 10% infection. (L.W. Koch)

ANTHRACNOSE (Colletotrichum phomoides). One canning company in Essex Co., Ont., reported that all loads of tomatoes contained a percentage of affected fruit. Damage was less severe than in 1938. (L.W. Koch)

PHOMA ROT (P. destructiva) has been observed occasionally on tomatoes in Ont., but it has never been found to be serious until this year. This fall, however, it was observed causing serious injury in 3 widely separated fields in the Brighton area. According to Mr. Sidney Simmons of this department, about 25% of the crop was affected in one field at at least 20% was destroyed in the other two. (J.E. Howitt)

BACTERIAL CANKER (Phytomonas michiganensis). A few diseased plants at least were found in most fields in the Okanagan, Kelowna and Vernon districts, B.C.; the average loss did not exceed 1%. (G.E. Woolliams)

BLOTCHY RIPENING (non-parasitic) caused a 30% reduction in the market value of the crop in 4 greenhouses at Gordon Head, B.C. (W.R. Foster). Tomato fruits showing this trouble were sent from a greenhouse at Colborne, Ont.; the owner reported a considerable portion of the fruit affected. (J.E. Howitt)

POTASH DEFICIENCY was observed at two points in P.E.I. and specimens were brought in from three others. (R.R. Hurst)

BREAKDOWN (non-parasitic). The tomato crop suffered serious losses from sun scald in some districts in the Okanagan Valley, B.C. The summer was particularly hot and dry. Breakdown was also present, but it was largely masked by the more serious damage caused by the sun scald. (R. Fitzpatrick)

CREOSOTE FUMES. About 40 beds of seedlings were seriously burned by fumes released from creosote paint in the Montreal district, Que. The paint was applied to the seed-bed frames during the winter. The seedlings in close proximity to the boards were especially affected. (E. Lavallee)

FRUIT CRACKING (non-parasitic) was severe, apparently due to environmental factors, at Morden, Man.

EELWORMS (Heterodera marioni) severely infected several individual plants in the greenhouse at Macdonald College, Que. (I.H. Crowell)

TURNIP

CLUB ROOT (Plasmodiophora Brassicae). About 5% of the roots were affected in a ton in storage at Metchosin, B.C. (W.R. Foster). The disease was reported from St. Nicholas, Que. All the turnips were infected in a small field at Pictou, N.S.; the crop was probably almost a complete loss (K.A. Harrison). A 30% infection was seen in Colchester Co., in a field of Ditmar. (W.K. McCulloch)

Club root was almost as severe in P.E.I. in 1939 as in previous years, although very little rain fell during the summer. All susceptible varieties were affected almost 100% in the club root area at the Laboratory. Infection probably took place early in the summer when moist conditions prevailed. Infection was slight on Laurentian swedes at Marshfield and it was severe on Ditmar at Union Road. (G.W. Ayers)

BROWN HEART (non-parasitic) was observed on 2 farms in Quebec; although the crop was not severely affected, it was unsaleable (C. Perrault). Brown heart was common on turnip in the southern and central part of N.B., where drought prevailed last year. (J.L. Howatt)

BORON INJURY was observed in seedlings in Queens Co., P.E.I., but all affected plants recovered later. (R.R. Hurst)

BLACK LEG (Phoma lingam). A few affected plants were found in two fields along Riviere des Prairies, Montreal Island, Que.; specimens received from two gardeners in Laval Co. indicate that black leg causes possibly a serious decay in this district. The disease is being studied by Mr. Roger Desmarteau, Quebec Plant Protection Service (E. Lavallee). Black leg caused slight to very severe damage in P.E.I. Of the varieties grown, Laurentian swedes showed the least infection. (R.R. Hurst)

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

SOFT ROT (Erwinia carotovora) was found affecting 2 plants in a series of plots at Knoydart, N.S., in August.

BLACK ROT (Phytomonas campestris). During the winter of 1938-39, many samples of turnips were sent to the Department disfigured by a trouble, which the growers called "Dry Rot". It appeared first on the outer skin as a small dark spot, which enlarged and disfigured the roots when temperatures were favourable. Isolations and re-inoculations by the Department of Bacteriology here at the College showed the cause was Phytomonas campestris. (J.E. Howitt)

TYPHULA ROT (T. umbrina Remsberg). This rot has been briefly described by P.J. Salisbury (Proc. Canadian Phytopath. Soc. 9:10-11. 1940). It was found to be prevalent in spring on pit-stored turnips in the Pemberton district, B.C. The first evidence of the disease are sunken, circular, shallow brown dry-rot areas. Sclerotia develop under the epidermis and become erumpent. Secondary bacterial invaders cause an extensive wet rot, on which numerous dark brown sclerotia and white mycelium develop. The organism has recently been described by Miss Remsberg (Ruth E. Remsberg, Studies in the genus Typhula, Mycologia 32:52-96, fig. 1-58. 1940).

DOWNY MILDEW (Peronospora parasitica). Infection was a trace to heavy in P.E.I. in September. (R.R. Hurst)

POWDERY MILDEW (Erysiphe Polygoni) infected the leaves of some plants in a greenhouse, Macdonald College, Que. (I.H. Crowell)

MOSAIC (virus). Specimens of affected steckling material were received from the Station, Nappan, N.S. (J.F. Hockey)

WATERMELON

LEAF SPOT (Cladosporium cucumerinum). A slight infection was present in most plantations in Essex Co., Ont.; but the damage was negligible. (J.K. Richardson)

FRUIT ROT (Mycosphaerella citrullina). Several fruits were affected by the typical black blossom-end rot in a ½-acre patch in Essex Co., Ont. (J.K. Richardson)