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EXPERIMENTAL FARMS BRANCH

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ELEVENTH ANNUAL

REPORT

OF THE

CANADIAN

PLANT DISEASE SURVEY

1931

Compiled by

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FOREWARD

The eleventh annual report of the Canadian Plant Disease Survey is considerably larger than the two previous reports. Such an increase in size is a direct reflection of the sustained interest of our collaborators in reporting the diseases in their territory. There has been a marked increase in the number of reports received. Several diseases new to Canada were recognized this year and reported to the Survey. In a number of instances, collaborators have included notes, which add greatly to the interest of the record. Besides these diseases, several others previously known to the individual collaborator in his section of the country were reported to the Survey for the first time. These diseases, however, are not indicated as new to Canada.

In addition to the regular Survey, Dr. G. R. Bisby has contributed a paper on "The Additions to the Fungous Flora of Manitoba" and Mr. Rene Pomerleau has presented a summary of his work on "The Distribution of White Pine Blister Rust in Quebec". These two contributions appear as separate section under the name of their authors. I am sure these papers will be of interest.

Although I have not added a list of collaborators, I wish to thank most cordially everyone who has contributed to the Survey. The names of many appear through the report, for when an item is of particular merit or where its value would be enhanced by the inclusion of the collaborator's name, it has been added at the end of the record. I am particularly indebted to Drs. A. W. Henry, G. B. Sanford, and P. M. Simmonds and their assistants for the comprehensive reports of diseases in Alberta and Saskatchewan. Dr. Wm. Newton has reported many diseases on Vancouver Island and in the lower Fraser Valley, which have not been previously noted in the Survey from that part of the Dominion. Mr. R. C. Russell of the Dominion Laboratory of Plant Pathology, Saskatoon, has continued to furnish records of his collections of parasitic fungi of Saskatchewan. Mr. H. N. Racicot of the Central Laboratory has contributed many records for Quebec. Special thanks are due to Dr. John Dearness for his unfailing interest and assistance. Both my collaborators and myself are indebted to him for the identification of many fungi, which would otherwise have remained undetermined.

A more simple and direct title has been adopted for the report to replace the one previously used. However, this report is numbered to conform with those already issued.

Suggestions, whereby the number of pages may be reduced without impairing the usefulness of the report, would be welcome. Up to now, I have attempted to retain the style of the early reports at the same time economizing on space in the actual typing.

March 15, 1932,
Division of Botany,
Ottawa, Canada.

I. L. Conners,
Plant Pathologist.

I. DISEASES OF CEREAL CROPS

WHEAT

STEM RUST - *Puccinia graminis* Pers.

B.C. - Stem rust was collected at Salmon Arm, Falkland, Koksilah, Mill Bay, Cobble Hill and Saanichton (M. Newton).

Alta.- Stem rust was first observed on August 20 on Garnet wheat at the Experimental Farm, Lacombe. Out of 825 fields examined, it was found in 15, which were located chiefly in zones 8 and 10.

Sask.- Stem rust appeared relatively late this year in Saskatchewan. It was first found at Saskatoon on July 25, and at Indian Head on July 27. Traces of stem rust were present in southern Saskatchewan on August 12, but the crop was practically ripe by that date. In northern Saskatchewan the grain was much heavier and later. However, damage from rust was very slight, except possibly in fields near the Manitoba boundary.

Man. - Heavy infections of stem rust were confined almost entirely to the area between the Red River on the east and a line joining Pilot Mound, Treherne and Lake Manitoba on the west, where the grain crops were the heaviest in the province. The average infection on common wheat in this area was 20 per cent, while in the southern part of the Red River valley it reached 25 per cent. The loss from rust in the larger area was estimated to be 3 to 8 per cent; in the Red River valley it varied from 5 to 10 per cent. In the south-western part of Manitoba the crops were much lighter and the loss from stem rust was placed at 0 to 1 per cent. In the northern half of the province most of the crops matured early and only traces of rust developed. However, in fields, where the grain was late, infections ranging from 20 to 40 per cent were present. The average loss in the northern half was one to 5 per cent.

Weather conditions appeared to play an important role in the spread of stem rust this year. During the first three weeks in June, precipitation was less than half the normal rainfall and heavy dews, which normally occur at night during this period, were almost entirely absent. On the other hand, during the last few days of June and the first week of July, the weather was very favourable for both spore germination and the development of the rust fungus. In consequence, although stem rust was not found until July 5, when traces of rust were observed at Morden and Morris, a sprinkling of rust was present throughout the southern part of Manitoba on July 8. Rust development continued very rapidly, so that on July 10

and 11, infections were reported as follows: Winnipeg, one per cent of the culms; Morris, 5 per cent; Morden, 30-40 per cent; and near Portage la Prairie, less than one per cent, with intermediate infections at places between those mentioned. Throughout the area, stem rust was less prevalent on Reward than on Marquis and Garnet, and less on Ceres than on Reward. Again, the average daily temperature was above normal during June and July. The crops were sown early and both reserve soil moisture and current rainfall were below normal. As a result most fields of cereals were rapidly maturing by the end of July and 95 per cent of the crops were ripe on August 10. The early ripening of the crops effectually halted further rust development.

In most fields of durum wheat only traces of rust were found. In one an infection of 25 per cent was reported.

Ont.- Pycnia of stem rust were found on May 12 and aecia on May 26 on the common barberry in the Arboretum at Ottawa.

In Carleton county most fields of wheat showed traces of stem rust. In one field infection varied from a trace to 5 per cent; the damage was nil. In Elgin county, three fields were examined, but no stem rust was observed.

Que.- Aecia of stem rust were found on twelve bushes of barberry in Mississiquoi county.

In L'Islet and Kamouraska counties, eight fields of Huron wheat were examined. Infection ranged from 10 to 50 per cent. At Macdonald College only a light infection was observed, apparently causing little or no damage.

N.B.- A trace of stem rust was found on wheat throughout the province.

N.S.- Specimens of the common barberry bearing mature aecia in abundance were received on July 1 from Cape Breton.

P.E.I.- The infection of stem rust was the heaviest observed on wheat for some time. Unlike its distribution in previous years, it was general throughout the Island. It caused a marked weakening of the straw and moderate to severe damage to the grain.

LEAF RUST - Puccinia triticina Erikss.

B.C.- Leaf rust was collected at Salmon Arm (several fields), Falkland, Koksilah, Cobble Hill, Mill Bay and Saanichton (M. Newton).

Alta.- Leaf rust was found in 10 per cent of the fields examined, being reported first on August 3. It was fairly abundant in zones 6, and 8 to 10, especially zone 8, where 26 fields out of 102 examined were rusted. In the rest of the province leaf rust was almost absent. The damage was estimated as follows: 30 fields, nil; 49 fields, less than 0.1 per cent; 3 fields, 0.1 to 1 per cent.

Sask.- Leaf rust was first reported on July 28 at Saskatoon. In south-eastern Saskatchewan it was fairly heavy in localized areas. It caused little or no damage except possibly in that part of the province.

Man.- Leaf rust was as widespread in the province as stem rust, but it was, as usual, less severe. Infections of leaf rust were light on Marquis, Reward, Garnet and Ceres, while fairly heavy infections were observed on Ruby and Kota. Traces only of rust occurred on durum wheat.

Leaf rust was first found on June 23 at Emerson, only a single pustule being collected. It was not again observed until July 5 and a trace was present throughout southern Manitoba by July 10. Unlike previous years, leaf rust was less prevalent than stem rust in the early part of the season. Usually the former is quite abundant by the time the latter makes its appearance. Doubtless the failure of leaf rust to develop, was due to the unfavourable weather conditions prevailing during most of June, which are briefly discussed under stem rust.

Que.- Leaf rust was reported from L'Islet, Kamouraska and Jacques Cartier counties. In general no damage occurred; some late fields may have suffered slightly.

Ont.- Leaf rust was fairly heavy on wheat in Carleton county, while there was a moderate infection on winter wheat in Elgin county. The damage was probably not more than a trace in either.

N.B.- Leaf rust was general on the plots of the Experimental Station, Fredericton.

N.S.- Although leaf rust was common on Marquis and Huron wheat in Kings county, it was not severe, except in late fields.

P.E.I.- Leaf rust was first reported on August 1, when it was observed on Huron wheat in Queens county. The outbreak was general over the Island. This rust was common and destructive to the leaves, but the amount of damage, which it caused, is difficult to estimate.

STRIPE RUST - Puccinia glumarum (Schmidt) Erikss.& Henn.

Dr. Margaret Newton has given a complete record of the collections of stripe rust which she has studied at the Dominion Rust Research Laboratory, Winnipeg, from 1927 to 1931. All these collections were made by Dr. Newton, except a few, where the collectors are indicated. The host and the place of collection are given below.

B.C.- Wheat: Dawsons Gold Chaff at Saanichton; Agropyron Richardsoni (Trin.) Schrad. at Point Gray, Mill Bay, Duncan, Agassiz; Bromus marginatus Nees at Victoria; B.sitchensis Bong. at Victoria, Duncan, Agassiz; Elymus glaucus Buckley at Victoria; E. Howellii Scribn. & Merrill at Victoria; E. marginalis Rydb. at West Saanichton; E. sp. at Victoria; Hordeum caespitosum Scribn. at West Saanichton (W. Newton); and H. jubatum L. at Victoria.

Alta.- Wheat: Chagot, Kubanka, Little Club and Stanley at Olds; Barley: O.A.C. at Olds; Agropyron Richardsoni at Edmonton; A. Smithii Rydb. at Red Deer; A. tenerum Vasey at Olds and Hobbema; and Hordeum jubatum at Lacombe, Olds, Red Deer, Edmonton and Hobbema.

Besides the report received from Dr. Newton,Dr. Sanford and his staff report the following collections of stripe rust in Alberta in 1931. Wheat: Chagot, Kubanka, Little Club at Olds; Chagot, Early Baart at Edmonton. Barley: O.A.C. 21 at Olds; White Barbless at Edmonton. Native grasses: Hordeum jubatum at many places from Calgary north and north-east to the Saskatchewan border and north to about the 54th parallel of latitude; Agropyron Richardsoni and A. tenerum at Hobbema, Mundare and in several locations near Vermilion; A. Smithii near Vermilion; on these native grasses and Bromus ciliatus L. in a grass nursery, Edmonton. Introduced grasses under cultivation: A. cristatum, A. desertorum, A. elongatum, A. obtusiusculum and A. sibiricum in University plots, Edmonton.

Collections of stripe rust from 1926 to 1930 found on wheat, barley and native grasses in many parts of Alberta and at Windermere, B.C. are recorded in the Plant Disease Surveys for these years. A complete list of varieties of wheat and barley found attacked by stripe rust in Alberta to

date is as follows. Wheat: White Federation, Bunyip, Marquis 7, Early Baart, Chagot, Bishop, Vermilion, Early Red Fife, Early Java, Little Club, Prelude, Reward, Jones Fife and Kitchener; Barley: O.A.C. 21 and White Barbless.

Sask.- Wheat: Marquis at Pontiex (B.J. Sallans) and Alsask (T.C. Vanterpool & J.H. Truscott); Aegilops sp. at Saskatoon.

Dr. Newton has found that all collections of stripe rust that she has cultured can infect wheat.

BUNT - Tilletia Caries (DC.) Tul. and T. foetens (Berk.) Trel.

In addition to the field surveys in the separate provinces, the following table on wheat bunt, prepared by Mr. Wm. Popp from the records of the Western Grain Inspection Division covering Western Canada for the three months ending Oct.31, 1931, may be of interest.

Wheat Bunt in Western Canada.

(Summary of inspections from Aug. 1 to Oct. 31, 1931).

	Cars Inspected	Cars "Smutty"	Percentage "Smutty"
Hard Red Spring	53,794	607	1.1
Alberta Red Winter	57	8	14.0
Durum	3,509	200	5.6
All wheat	57,456	816	1.4

Compared with last year there has been a marked reduction in the amount of smutty durum wheat, 16.6 per cent grading smutty in 1930 as against 5.6 per cent this year. Hard Red Spring wheat is also somewhat freer of bunt and as a result the percentage of all wheat grading smutty for the quarter has fallen from 2.8 per cent in 1930 to 1.4 per cent in 1931.

B.C.- A sample of winter wheat, O.A.C. 104, grown at Armstrong in 1931, was found heavily inoculated with spores of Tilletia Caries. Evidently bunt had destroyed a high percentage of the heads. The correspondent noted that the infected heads were borne on culms, which were considerably shorter than those bearing healthy heads.

Alta.- Bunt was widely distributed in Alberta. It was found in 51 fields out of 825 examined. However, the individual infections were higher in the northern part of the province; an infection of 40 per cent was observed in one field in zone 8, and 50 per cent in one in zone 9. Tilletia foetens was confined mostly to the southern part of the province.

Sask.- Bunt was reported from 15 fields out of 240 examined. In most fields only a trace was present; in a few, infections of one to two per cent were observed. In general Tilletia Caries was more prevalent than T. foetens. In a small increase plot of the variety Liguleless at the University of Saskatchewan over 10 per cent of bunt was observed.

Ont.- Bunt due to Tilletia foetens was found in three fields of Huron wheat out of four examined in Elgin County. In two fields 4 per cent of the heads were bunted while in the other field 28 per cent were destroyed.

Que.- An average infection of 25 per cent of bunt (T. foetens) was observed in three fields of Huron wheat in L'Islet and Kamouraska counties.

P.E.I.- A single head was found affected with Tilletia foetens in Queens county.

LOOSE SMUT - Ustilago Tritici (Pers.) Jens.

Alta.- The average damage from loose smut was reported as only 0.04 per cent, the highest loss being 2 per cent. Nevertheless, out of 825 fields examined, 43 or 5.2 per cent were affected and in zone 10 out of 376 fields, 31 or 8.2 per cent were smutted.

Sask.- Out of 240 fields examined, 52 or 21.7 per cent were affected with loose smut. When the fields that were inspected were classified according to variety, it was found that the percentage of fields of each variety infected, was as follows: Marquis, 10 per cent; Garnet, 25; Ceres, 83; and Reward, 86.

Man.- Loose smut was present in 47 out of 48 fields examined. Infections were recorded as follows: 36 fields, trace to one per cent; 5 fields, 2 per cent; 4 fields of Reward, 2 to 7 per cent; 1 field of Kota, 3.6 per cent; 1 field of Ceres, 4 per cent. A trace to 1 per cent of smut was present in 13 out of 14 fields of durum wheat examined.

Ont.- Loose smut was again prevalent throughout western Ontario. Infection varied from 2 to 15 per cent. In Carleton county traces of smut were observed.

Que.- Infection by loose smut varied from 5 to 20 per cent in 8 fields of Huron wheat in L'Islet and Kamouraska counties, two fields showing the higher figure.

P.E.I.- Loose smut affected 15 per cent of the heads in a field of Huron in Queens county.

BLACK CHAFF - Pseudomonas translucens J.J. & R. var. undulosa (S.J. & R.) Stev.

Alta.- Black chaff was found in ten fields out of 828 examined and the damage was estimated at a trace.

Man. - Black chaff was reported from one field.

BASAL GLUME ROT - Pseudomonas atrofaciens (McCull.) Stev.

Alta.- Basal glume rot was reported from 10.3 per cent of the 825 fields examined. The heaviest infections were in zones 9, 10 and 11, where appreciable damage was caused in some fields.

Sask.- Out of 240 fields, 6 were found affected with basal rot and, although 10 per cent of the heads were affected in one field, the damage appeared to be slight. The disease was observed principally in the Battleford area, where infected fields were seen in addition to those reported.

Man. - Basal glume rot was severe in the two fields, where it was observed.

ERGOT - Claviceps purpurea (Fr.) Tul.

Alta.- Ergot was observed in only four fields. The highest infection was 2 per cent in one field in zone 11,

P.E.I.- Ergot was not common this year. Only traces were observed.

POWDERY MILDEW - Erysiphe graminis DC.

Alta. - Heavy infections of powdery mildew were common in experimental plots and in lodged places in fields.

Man. - A trace of powdery mildew was observed in one field.

Ont.- In a field of Huron wheat in Elgin county, the lower leaves were slightly affected.

P.E.I.- Powdery mildew was not common this year and where present caused slight damage.

GLUME BLOTCH - Septoria nodorum Berk.

Alta.- Glume blotch was reported in 175 or 21.2 per cent of the fields examined. The disease was reported from zones 6 and 8 to 11, the average damage being 0.4 per cent.

Sask.- Very little glume blotch was reported in southern Saskatchewan. It was found more frequently in the Battleford area, but it was generally present only on heads borne on prostrate culms.

Man.- A slight amount of glume blotch was reported in one field.

Que.- Glume blotch affected several varieties in Quebec, but the damage was apparently slight.

N.S.- Of all the varieties grown at the Experimental Farm, Nappan, Hope was the most severely affected with glume blotch. Seventy-five per cent of the heads were attacked.

P.E.I.- Glume blotch caused slight to moderate damage on the Island.

LEAF SPOTS

Alta.- Leaf spots reported to be due to Septoria Tritici Desm. were found in 26 or 3.4 per cent of the fields examined. The spotting was present in zones 8 to 13 only. The damage was estimated as follows: 9 fields, none; 17 fields, trace.

Sask.- Leaf spots were found in 68 fields out of 240 examined. They appeared to be more common in the zones that suffered least from drouth. The spots were caused by Septoria Tritici and S. nodorum in some cases.

ROOT ROTS

As in previous reports the root rot diseases are considered together with special reference to the specific pathogens as far as they are reported.

Alta.- Take-all (Ophiobolus graminis Sacc.) was reported in 247 fields out of 825 examined or 29.9 per cent of the fields visited. The average damage was estimated to be 1.1 per cent for all the fields surveyed, or 3.6 per cent for the diseased fields. In zone 9, where soil moisture was sufficient, the average damage was estimated to be 2.3 per cent. In zones 1 to 5 and in the southeastern sections of zones 6,8 and 10, the soil was too dry for typical take-all symptoms to develop. In consequence probably many fields affected with take-all in these zones were not reported as only those where the symptoms were typical were included in this estimate.

Root rot attributed to Helminthosporium sativum Pamm. King & Bakke and Fusarium spp. was found in 474 out of 825 fields examined, the percentage diseased being 57.4 per cent. The average damage was estimated to be 0.5 per cent for the fields surveyed or 0.8 per cent for the diseased fields. All cases of root rot except those showing typical take-all symptoms have been listed here.

Sask.- Take-all was very little in evidence this year except in a few districts, which did not suffer from drouth. It was reported from 28 fields out of 293 examined. The average damage was estimated to be a trace in zones 1, 7 and 9, and moderate in zone 10. As in previous years infections were found on comparatively new land.

Root rot caused by Helminthosporium sativum and Fusarium spp. was reported from 290 fields out of 293 visited. The average damage was considered moderate in zones 1, 2 and 9, and slight in zones 7 and 11. This type of root rot was quite severe in some fields of the drier areas. It was present practically everywhere, but does little damage on new land. (R. C. Russell).

Survey trips made during the middle of June in zones 10 and 11 and in the northern sections of zones 7 and 9, revealed a surprisingly small amount of the Helminthosporium type of root rot on wheat seedlings. After the late June rains, the outer leaves that had been damaged earlier by soil drifting, drought, or frost, were heavily infected near the base with Helminthosporium sativum, which was rapidly spreading to the tissue beneath and thus causing severe late-seedling blight. The damage was moderate to severe. (T. C. Vanterpool).

Browning root rot was found in 13 out of 240 fields, examined. Eleven of these fields were found in zone 11. Some of the fields showed light, but definite symptoms of browning, but the damage appeared to be slight (R. C. Russell).

All reports of browning root rot were received from the eastern and northern parts of the province. Severe cases of browning root rot were observed on summerfallow at Prudhomme, Humboldt, Brada (southeast of North Battleford) and at the Experimental Station, Scott. On June 25th one of the best examples of the disease ever encountered was that found at Brada. Plants in the healthy patches averaged 4 to 8 inches higher than those in the diseased spots. Secondary or crown roots were plentiful and over 50 per cent of them were rotted at the tips. Pythium oospores were numerous. Browning root rot was difficult to locate in the field on account of injuries suffered by the plants from drought, frost and soil drifting. The disease showed about the same distribution and severity as last year, and was not as serious as in 1928. (T.C. Vanterpool).

Man.- Root rot attributed to Helminthosporium sativum and Fusarium spp. was reported from 148 fields. The damage in the individual fields varied from a trace to severe.

HEAD BLIGHT - Gibberella Saubinetii (Mont.) Sacc.& Fusarium spp.

Alta.- Isolated heads affected with head blight were found in five fields in zones 9 and 10.

Sask.- Head blight was found in three fields out of 240 examined. In one field two to three per cent of the heads were affected.

Que.- Head blight was found in several varieties at Macdonald College. The average infection was estimated to be one per cent. The damage was slight.

N.B.- Traces of head blight were observed in the experimental plots, Fredericton. One field of Garnet wheat showed 2 per cent of the heads blighted.

N.S.- Less than one per cent of head blight was present on several varieties at the Experimental Farm, Nappan. A trace was also present in the rod row plots at Kentville.

P.E.I.- One per cent of the heads of Red Fife were affected with blight in a field in Kings county. Damage was slight.

HEAD BLIGHT - Helminthosporium sativum Pamm. King & Bakke

Alta.- Traces of head blight were found in zones 4, 8 and 10.

Sask.- A trace was found on the low heads in two fields.

"BRITTLE DWARF" Disease - Cause unknown

Sask.- What is believed to be a new disease has been observed for the last seven or eight years in the Field Husbandry plots of the University at Saskatoon. Both winter and spring wheats are susceptible and certain hybrid varieties have shown extreme susceptibility. Affected plants are invariably stunted with a tendency to excessive stooling. The heads are occasionally malformed with the portion of the top internode just below the head somewhat twisted or otherwise distorted; usually, they are empty or contain only small shrivelled kernels. The stems are exceedingly brittle and may be broken off readily at or between the nodes. Aphids are associated with the diseased plants and commonly occur in masses under the leaf sheaths. In 1925 and 1928 bacterial lesions similar to black chaff were common on the majority of the affected plants, and this season a definite mottling of the leaves was noticed. It is possible that a disease complex is here manifest. Specimens were sent to Dr. H. H. McKinney, U. S. D. A., for examination, In his reply he mentions that it is not the same as the mosaic occurring in the United States east of the Mississippi river and says that, "It is a curious looking disease and I should say merits further study". The trouble can often be traced to what appears to be an infection source and is frequently severe enough to ruin one half of a fortieth acre plot. Individual plants have been found at widely separated points on the campus. Seed from diseased plants failed to reproduce the disease either in the greenhouse or field. It has not been seen outside Saskatoon. This note is intended to draw the attention of other pathologists to the disease so that they may be on the look out for it on survey trips. "Brittle Dwarf" is suggested as a common name. Saskatoon, Sask., September, 1931. (W. P. Fraser, P. M. Simmonds and T. C. Vanterpool).

STEM BREAK - Cause unknown

Sask.- Stem break is reported to occur to some extent every year in many fields in almost all parts of the province; the damage is slight. The trouble appears first about July 15. It was probably not as prevalent as usual this year. A little of the trouble was found in the University plots, Saskatoon (T. C. Vanterpool).

FROST INJURY

Sask.- During May several frosts killed back the leaves of wheat more or less completely in zones 7, 9, 10 and 11, and probably in others. Younger seedlings seemed to suffer more than older ones. The damage was probably slight in fields sown with plump, vigorous seed. The injury was aggravated by high winds and soil drifting. The degrees of frost at Saskatoon were:

May 5, 11.5°F.; May 19, 6.0°F; and May 20, 5.5°F.

SOIL DRIFTING

Sask.- Damage caused by high winds and drifting soil is probably not very great although the seedlings must suffer a setback due to abrasion and dessication. The damage is confused with frost injury. On six days in May the wind reached a maximum velocity of 31 to 41 miles per hour at Saskatoon.

LEAF DISTORTION - Cause unknown

Sask.- For several seasons the flag leaf has been found distorted in Hard Federation at Indian Head. Damage was apparently nil.

GLUME DARKENING - Cause unknown

Sask.- This condition occurs occasionally and is probably physiological. It does not appear to cause any harm.

NEMATODE DISEASE - Heterodera punctata Thorne

Sask.- Only one field affected with this root rot was reported this year. The parasite appears to die out as soon as rotation of crop is begun on new land.

OATS

STEM RUST - Puccinia graminis Pers.

B.C.- Stem rust was general on oats on Vancouver island. The damage was slight.

Alta.- Out of 149 fields examined only two were found rusted. The damage was a trace.

Sask.- Stem rust appeared very late this year. In southeastern Saskatchewan on July 12, the stage of the crop varied from the early milk to the firm dough, some fields being ripe. At that time rust infections varied from a trace to three per cent and the average damage was later estimated to be slight. In northern Saskatchewan where the crop was much heavier and later, damage from stem rust was slight in zone 7 and a trace in zones 9 and 11.

Man.- Stem rust of oats appeared at the same time and was about as prevalent as wheat stem rust. It was heaviest in the

southeastern part of the grain growing area, the average infection being 25 per cent in fields ripe by August 10. In the northern half of the province, stem rust caused an average infection of 5 per cent on the early crop. In both areas late fields were heavily rusted and considerably damaged. The losses due to rust were also about the same for oats as for wheat (see wheat stem rust).

Ont.- A trace of stem rust was found in Carleton county. Stem rust was heavy on late varieties in the crown rust nursery at Ottawa.

Que.- Stem rust infections varied from 10 to 25 per cent in six fields of Alaska oats examined in L'Islet and Kamouraska counties.

N.S.- Slight infections of stem rust were observed in two fields in Colchester county.

P.E.I.- Stem rust was present throughout the Island, infection averaging 10 per cent on August 15. It was abundant causing moderate to severe damage by September 1.

CROWN RUST - Puccinia coronata Corda

Man.- Traces of crown rust were found throughout southern Manitoba by July 27. Subsequently the infection became patchy in the Red River valley, varying from a light sprinkling of rust in some fields to 40 per cent infection in others. Damage from rust was confined to the late fields. Traces of crown rust could also be found late in the season in the southwestern part and the northern half of the province.

Ont.- Pycnia of crown rust were observed on May 11, and aecia on May 26 on buckthorn in the Arboretum, Ottawa.

Crown rust was very patchy in Carleton county, infections varying from a trace to 15 per cent, according to the field examined. The role of the buckthorn in initiating the infection was not established in the few fields examined. Some varieties were heavily infected in the crown rust nursery at Ottawa.

Que.- A slight infection of crown rust was observed in Jacques Cartier county, while 10 to 20 per cent of rust was found on Alaska oats in Kamouraska and L'Islet counties.

N.S.- Crown rust was heavy on late fields of oats at Nappan. The damage was slight. Rust infections were generally light in

the fields examined in Pictou, Halifax and Colchester counties, only occasionally causing slight damage.

P.E.I.- Crown rust was found on buckthorn at Charlottetown in July. The rust was abundant on oats this year and apparently caused moderate to severe damage.

SMUT - Covered Smut - Ustilago levis (Kellerm. & Swingle) Magn. and Loose Smut - Ustilago Avenae (Pers.) Jens.

Alta.- Out of 235 fields examined, 110 or 46.9 per cent were infected with smut. The average damage was estimated to be 1.4 per cent. Smut appeared to be somewhat heavier in the southern part of the province, but this may have been due to the small number of fields observed. Most of the fields were affected with covered smut; only in a few fields was loose smut recorded.

Sask.- Covered smut was found in 25 fields out of 42 examined, while loose smut was present in only six. In a few fields 20 per cent or more of covered smut was recorded, but in most fields the damage ranged from a trace to 5 per cent. In one field in zone 1, 2 per cent of loose smut was present; in the others, the infection was a trace. Sixty per cent of loose smut was reported by a farmer from Quill Lake, where the oats had not been treated.

Man.- Covered smut was somewhat more prevalent than loose smut. The former was reported as follows: 23 fields, trace to 6 per cent; 1 field, 15 per cent; 1 field, 50 per cent. The latter was found as follows: 19 fields, trace to 3 per cent; 4 fields, 10 to 25 per cent.

Ont.- Loose smut was very prevalent in Wellington county this year. In some infected fields 17 per cent of the panicles were smutted. Both the loose and covered smuts were reported from Carleton and Lincoln counties; the average infection was about 10 per cent for loose smut and 2 per cent for covered.

Que.- In five fields of Alaska oats in Kamouraska county, 2 to 5 per cent of the panicles were destroyed by loose smut. In a plot of Banner, Macdonald 44, at Macdonald College, 5 per cent of the panicles were affected with loose smut.

N.S.- Loose smut was reported in the following counties: Kings, less than one per cent in several fields examined; Colchester, 3 to 6 per cent in 4 fields; Pictou, 3 to 10 per cent on 2 fields. Similarly, covered smut was recorded as follows: Colchester, 3 per cent in 2 fields; Halifax, 6 per cent in one field.

P.E.I.- Loose smut was abundant this year. Out of 50 fields examined throughout the province, 42 were smutty, infection ranging from a trace to 65 per cent, with an average infection of 8 per cent.

HALO BLIGHT - Pseudomonas coronfaciens (Ch. Elliott) Stev.

B.C.- Halo blight was general on Vancouver island and caused slight damage.

Alta.- Halo blight was reported from 42 fields out of 235 examined. The amount of damage in diseased fields was: 22 fields, none; 20 fields, a trace.

Sask.- Halo blight was reported from 2 fields out of 46 examined. At Maryfield the infection was severe on the lower leaves. In addition 20 fields were affected with leaf spots, which caused a trace to very slight damage. In many fields these leaf spots may have been halo blight, but they differed somewhat in appearance from that disease.

Halo blight was reported from Lintlaw, where the disease had been noticed the previous year in the same locality. It was worse in low spots of the field, where the soil was peaty.

Que.- Halo blight was very severe on several varieties at Macdonald College, infection varying from 10 to 100 per cent. This disease has been very serious on the College experimental plots and is interfering with the varietal tests. However, in a survey made last summer in several districts of the province, it was found to be of minor importance elsewhere.

BACTERIAL STRIPE BLIGHT - Bacterium (Pseudomonas) striafaciens Ch. Elliott

Alta.- Bacterial stripe blight was found in 48 out of 149 fields examined. The damage was as follows: 34 fields, none; 14 fields, a trace.

ROOT ROT

Alta.- Root rot caused by Helminthosporium sativum and Fusarium spp. was found in three fields out of 149 examined. Damage was a trace.

Sask.- Helminthosporium-Fusarium root rot was widespread (in 45 out of 49 fields examined), but it was rather mild in its action (damage, a trace). Crops on new land showed less lesioning on the average than those on older fields. In two

1/100th acre plots at Saskatoon about one per cent of the plants were affected with seedling blight due to Fusarium. The diseased seedlings were conspicuous on account of their yellow colour among the green and taller healthy ones.

Prematurity blight was present in four out of 42 fields. The disease was not very prevalent this year.

Man.- Helminthosporium-Fusarium root rot was found to some extent in Manitoba, causing a trace to slight damage.

BLAST - Cause unknown

Alta.- Blast was very common in all parts of the province. It was reported in 192 fields out of 235 examined. The average damage was estimated to be 6.1 per cent and in individual fields the loss was placed as high as 20 to 30 per cent.

Sask.- Blast was reported in 15 fields out of 46 examined. The trouble was quite noticeable this year; sometimes 90 per cent of the heads showed more or less blasting of the spikelets. The damage was slight to moderate. The extremely dry hot season may have favoured the disease.

N.S.- Blast was present in all the plots at Nappan and it was general in the ordinary fields.

P.E.I.- Blast caused slight damage in Queens county, average infection being 3 per cent in 25 fields.

LEAF BLOTCH - Helminthosporium Avenae Eidam

B.C.- Leaf blotch was general on Vancouver island. The damage was slight.

Alta.- It was found in 15 fields out of 235 examined. Damage was a trace only in the infected fields.

Que.- Leaf blotch was heavy on Alaska in Kamouraska and L'Islet counties.

N.B.- This disease was reported as general in York county.

SPECKLED LEAF BLOTCH - Leptosphaeria avenaria Weber (Septoria Avenae Frank)

Que.- Speckled leaf blotch caused slight damage to Banner, M.C. 44, on the plots at Macdonald College. It was present late in the season in several districts of Quebec, but infection took place too late to do any real harm.

N.B.- This disease was common along with leaf blotch, caused by Helminthosporium Avenae, at the Experimental Farm, Fredericton.

SEEDLING INJURY

Sask.- Oats suffered severe damage in the seedling stage in the experimental plots Saskatoon. The injury was probably due to frost, wind or drought, but it was impossible to decide which was the most important.

BARLEY

STEM RUST - Puccinia graminis Pers.

B.C.- Stem rust was collected at Salmon Arm and Cobble Hill. (M. Newton).

Alta.- Scattered local infections of stem rust were found late in the season, in five fields, all located in zone 10. It caused no damage.

Sask.- Stem rust was reported in 6 fields out of 24 examined. A mere trace of rust was found in zone 11, while more rust was found in some fields in zones 1, 2 and 7. Very little damage resulted.

Man.- Stem rust was prevalent on barley in Manitoba, It caused about the same amount of damage on barley as on wheat (see wheat stem rust).

Que.- Stem rust infections varied from 5 to 10 per cent in three fields in Kamouraska and L'Islet counties.

P.E.I.- In the plots at Charlottetown infections of stem rust varied from a trace or 10 per cent.

LEAF RUST - Puccinia anomala Rostr.

B.C.- Leaf rust was general on Vancouver island and in the lower Fraser valley. Damage was slight.

Man.- Slight traces of leaf rust were present throughout Manitoba.

Que.- Leaf rust infections varied from 3 to 5 per cent in two fields in Kamouraska county.

LOOSE SMUT - Ustilago nuda (Jens.) Rostr.

Alta.- Loose smut was found in 6 fields out of 116 examined. The highest infection observed was 6 per cent.

Sask.- This smut was reported from 6 fields out of 24 examined. Generally less than one per cent of the heads were smutted, except in a field at Midale and in a few experimental rows at Saskatoon, where five and seven per cent of the heads respectively were affected.

Man.- A trace to one per cent of loose smut was observed in 10 fields.

Ont.- Loose smut destroyed one per cent of the heads in a field in Carleton county.

N.S.- Three to 5 per cent of loose smut was reported in one field each in Colchester, Pictou and Halifax counties. One of the fields was in two-rowed barley.

P.E.I.-Loose smut affected 3 per cent of the heads in one field in Queens county.

COVERED SMUT - Ustilago Hordei (Pers.) Kellerm. & Swingle

Alta.- Covered smut was both common and destructive in Alberta. Out of 116 fields examined 62 or 53.5 per cent were smutty, the average damage being 2.3 per cent. The two highest infections were 25 and 70 per cent respectively.

Sask.- Covered smut was found in 10 out of 24 fields examined. Infection was usually only a trace, except in one field in zone 7, where 10 per cent of the heads were destroyed.

Man.- Covered smut was reported as follows: 10 fields, trace to one per cent; two fields, 3 to 4 per cent.

Que.- Very little covered smut was found at the Experimental Farm, Ste. Anne de la Pocatiere, but infections ranging from one to 3 per cent were found in 3 fields in Kamouraska county.

N.B.- A trace of covered smut was found at the Experimental Station, Fredericton.

P.E.I.- Covered smut affected up to 15 per cent of the heads in 10 fields in Queens and Kings counties.

STRIPE - Helminthosporium gramineum Rabh.

Alta.- Stripe was found in 14 fields out of 112 examined. The damage was as follows: 9 fields, trace; 3 fields, 1-5 per cent; 2 fields, 5-10 per cent.

Sask.- This disease was found only in the experimental plots at Indian Head and Saskatoon, where it was present on one or two varieties in each instance.

Man.- Stripe was found in 5 fields in Manitoba. The damage was slight in three fields and moderate in two.

N.B.- Barley stripe was reported from York county.

FALSE STRIPE - Cause undetermined

Sask.- Two per cent of the plants of O.A.C. 21 were affected in the rod row plots at Indian Head.

BACTERIAL BLIGHT - Pseudomonas translucens J.J. & R.

Alta.- Bacterial blight was present in 9 fields out of 78 examined. It caused a trace of damage in 3 fields.

NET BLOTCH - Pyrenophora teres (Died.) Drechsl.
(Helminthosporium teres Sacc.)

Alta.- Net blotch was found in 33 fields out of 116 examined. The damage was negligible, being none in 15 fields, a trace in 10, and light in 8.

Sask.- Net blotch was found in 16 fields out of 24 examined. Infections were usually very light in the southern part of the province and in the drier parts of zone 9, but some heavy infections were seen in the north, where the disease caused slight damage.

Man.- This disease was found in 7 fields, infections being a trace in 2 and moderate to severe in 5.

P.E.I.- Traces of net blotch were observed in the head row plots at Charlottetown.

SPOT BLOTCH - Helminthosporium sativum P.K. & B.

B.C.- Spot blotch was general on Vancouver island and in the lower Fraser valley. The damage was slight.

Alta.- Spot blotch was found in 20 fields out of 116 examined, causing no damage in 17 fields and a trace in 3.

Man.- A trace of spot blotch was found in 4 fields.

P.E.I.- Spot blotch was heavy in a field in Queens county.

ROOT ROT

Alta.- Root rot caused by Helminthosporium sativum and Fusarium spp. was reported from 8 fields out of 78 examined. the damage being a trace to slight.

Sask.- Helminthosporium-Fusarium root rot was found in 23 out of 24 fields visited. The damage was slight to moderate. Infection increased rapidly after July 1. The drier districts and the older fields showed the highest infections.

Prematurity blight was observed in three fields, all located in southern Saskatchewan.

Man.- Root rot of the Helminthosporium-Fusarium type was reported in 19 fields. The damage varied from a trace to moderate.

SCALD - Rhynchosporium Secalis (Oud.) Davis

B.C.- Scald was found severely injuring O.A.C. 21, Hannchen, Gold, Star, Plumage, Archer, Duckbill and Charlottetown in the experimental plots at Saanichton. Trebi appeared to be very resistant.

Alta.- Scald was found in 12 fields out of 116 examined, causing a trace to slight damage. The disease caused considerable damage on the experimental plots, at Vermillion, Lethbridge, Olds and Edmonton.

Sask.- A trace of scald was found in 3 fields out of 24 examined.

ERGOT - Claviceps purpurea (Fr.) Tul.

Alta.- A trace was found in one field out of 78 examined.

POWDERY MILDEW - Erysiphe graminis DC.

Que.- Powdery mildew was severe in one field in Megantic county.

P.E.I.- This disease was reported as severe on some volunteer barley in Queens county.

RYE

STEM RUST - Puccinia graminis Pers.
Man.- Stem rust did no damage to rye.

Que.- A light infection of stem rust was observed in Kamouraska county.

LEAF RUST - Puccinia dispersa Erikss.
Alta.- A trace of leaf rust was found in 3 fields out of 14 examined.

Sask.- Traces of leaf rust were reported from Kipling.

Man.- A trace of leaf rust was found at Gladstone.

Ont.- Two per cent of leaf rust was observed on rye growing in a field of wheat in Elgin county.

STEM SMUT - Urocystis occulta (Wallr.) Rabh.
Sask.- A trace of stem smut was found in one field near Neudorf. This single report is in marked contrast to the outbreak of last year, when 19 fields were found smutted, and infections varied from a trace to 11 per cent. 1931

ERGOT - Claviceps purpurea (Fr.) Tul.
B.C.- Ergot was reported from Summerland on volunteer rye.

Alta.- Ergot was found in 12 fields out of 14 examined. The damage was a trace to light in most of the fields surveyed. Four growers living in zones 6 and 10 reported that ergot had caused heavy damage to their rye.

Sask.- Ergot was rarely seen in most parts of Saskatchewan this season. This was possibly due to the drouth in spring and early summer.

The disease was not common in the plots at Saskatoon, and what was present, was distributed unevenly. It appeared much later than usual and then on the late maturing heads.

Man.- A trace of ergot was reported from one field.

Ont.- A light infection of ergot occurred in rye grown as a cover crop in Lincoln county.

Que.- Three per cent of the heads of rye, Common 513, were affected with ergot at Macdonald College. A trace was also reported from Kamouraska county.

ROOT ROT

Sask.- Helminthosporium-Fusarium root rot was found in 12 fields out of 14 examined. The disease was common and widespread, but it caused only slight damage.

Man.- A trace of root rot was reported in two fields.

BACTERIAL BLIGHT - Pseudomonas translucens J.J. & R. var. Secalis (R. G. & J.) Stapp

Alta.- Bacterial blight caused a trace of damage in 4 fields out of 14 examined.

Sask.- A purple stem streak, possibly caused by bacteria was seen near Hafford. The infection was light.

LEAF SPOTS - Cause undetermined

Sask.- Leaf spots caused a trace of damage in 3 fields out of 14 examined.

II. DISEASES OF FORAGE AND FIBRE CROPS

ALFALFA

LEAF SPECK - *Pseudopeziza Medicaginis* (Lib.) Sacc.

B.C.- Leaf speck was general on Vancouver island and in the lower Fraser valley. The damage was slight. Wherever alfalfa was used as a cover crop in orchards in the Okanagan valley, it was severely affected with leaf speck.

Alta.- Although leaf speck was usually present and was severe in certain fields, the disease was apparently not as important as in previous years.

Sask.- Infections from leaf speck were very light, but only a limited number of fields were visited and in these, conditions had been very dry.

Man.- Leaf speck was not injurious at the Agricultural College, Winnipeg.

Que.- Leaf speck was heavy in several fields in Jacques Cartier county and it caused severe defoliation in some. A moderate infection was also reported in one field in Kamouraska county.

N.B.- Leaf speck was common on alfalfa throughout the province and caused moderate damage in some fields.

N.S.- From 10 to 70 per cent of the leaves were affected with leaf speck in the fields examined in Kings and Cumberland counties.

P.E.I.- Leaf speck was common, but caused little damage in Queens county.

SCLEROTINIA ROOT ROT - *Sclerotinia Trifoliorum* Erikss.

B.C.- *Sclerotinia* root rot was general on Vancouver island, but the damage was slight.

Alta.- Several fields were found, chiefly in zone 10, where *Sclerotinia* root rot caused a trace to moderate damage. Severe killing was produced experimentally at Lacombe and Edmonton. Symptoms of the disease are most easily observed during April and early May.

BACTERIAL BLIGHT - *Pseudomonas Medicaginis* Sackett

B.C.- Bacterial blight was found in one field only at Edgewood, Arrow Lake district, on June 17. The damage was about

5 per cent. Diagnosis of the disease was confirmed by laboratory examination and cultures. (J.W. Eastham).

Alta.- Bacterial blight was reported from 3 fields out of 13 examined. It caused a trace to slight damage.

LEAF SPOT and STEM CANKER - Ascochyta Meliloti (Trel.) Davis
Alta.- This disease was common and sometimes severe.

BROWN ROOT ROT - Plenodomus Meliloti Dearn. & Sanford
Alta. Brown root rot caused slight damage in 2 fields out of 10 examined. The damage is difficult to detect in fall inspections.

N.S.- Slight to moderate infection of brown root rot was observed on plants examined in fields of alfalfa, two or more years old, in Kings and Cumberland counties. Some plants die out in fields of all ages. The identity of the disease was confirmed by Dr. Sanford. (J.F. Hockey)

VIOLET ROOT ROT - Rhizoctonia Crocorum (Pers.) DC.
Alta. Rhizoctonia Crocorum was identified as the pathogen in two collections of root rot material from the Lethbridge district. A trace of infection was found (G. B. Sanford). In addition to this record violet root rot was also collected on potato in Saskatchewan this year (see under potato). It is believed that this disease has not been reported previously in Canada. Buddin and Wakefield (Trans. Brit. Myc. Soc. 12:116-140, pl. 11-14. 1927 and ibid 14: 97-99. 1929) present evidence to show that Helicobasidium purpureum (Tul.) Pat., one of the Auriculariales, is the perfect stage of Rhizoctonia Crocorum.

RUST - Uromyces Medicaginis Pass.
Man.- A few pustules of rust were found in Manitoba for the first time this year. It was collected at the Agricultural College, Winnipeg.

DODDER - Cuscuta sp.
B.C.- Dodder was severe in limited areas on Vancouver island.

COMMON CLOVER

POWDERY MILDEW - Erysiphe Polygoni DC.

B.C.- Powdery Mildew was general on alsike and red clover on Vancouver island and in the lower Fraser valley. The damage was slight on alsike and moderate on red clover. The disease was also quite general throughout the Okanagan valley.

Alta.- Powdery mildew is fairly common; infections vary from a trace to light.

Que.- Powdery mildew was found in four fields in Kamouraska and L'Islet counties. Infection was general in these fields. Moderate infections were reported on red clover in Missisquoi and L'Assomption counties.

N.B.- The disease was fairly common on red clover throughout the province. The damage was not estimated.

N.S.- Powdery mildew was general in a small area in a field of red clover in Colchester county.

P.E.I - Powdery mildew was general on the second crop of red clover throughout the province in September, and caused slight to severe damage to the crop. The early infections on the first crop were not injurious.

RUST - Uromyces Trifolii (Hedw.f.) Lév.

B.C.- Rust was general on red clover on Vancouver island and in the lower Fraser valley. The damage was slight.

Alta.- Rust was observed on alsike clover at Edson, Entwistle, Olds, Wetaskiwin and in several locations near Edmonton. Both the aecial and telial stage were collected at Edmonton, and the identification of the rust verified by Dr. G. R. Bisby.

Sask.- A fairly heavy infection of rust was collected on alsike clover near Melfort.

Que.- Rust was observed on red clover in Jacques Cartier county. Fully 75 per cent of the leaves bore pustules in the fall. Rust was also reported from two fields in Kamouraska county.

N.S.- Slight to moderate infections of rust were reported on alsike from Colchester county. The rust was also general and heavy on second-crop red clover in many places in the province.

P.E.I.- Moderate infections of rust on red clover were recorded.

PSEUDOPEZIZA LEAF SPOT - Pseudopeziza Trifolii Fuck.

B.C.- This leaf spot was general on red clover on Vancouver island and in the lower Fraser valley.

Alta.- Pseudopeziza leaf spot was collected at Lacombe.

N.S.- Moderate infection of the leaf spot was reported on red clover from 2 fields in Colchester county.

P.E.I.- This leaf spot was found in Queens county. Fifty per cent of leaves were affected, but little damage occurred.

CERCOSPORA LEAF SPOT - Cercospora zebrina Pass.

Alta.- Cercospora leaf spot was collected at Lacombe.

SOOTY SPOT - Dothidella Trifolii Bayl.-Elliott & Stansf. (Polythrincium Trifolii Kunze)

Alta.- Sooty spot was collected at Wetaskiwin, Edmonton and Edson. It is fairly common on alsike clover late in the season. What was probably the pycnidial stage (Sphaeria Trifolii Pers.) was found by Dr. G. R. Bisby in a collection sent to him for examination.

Sask.- A trace of sooty spot was found on alsike growing by the roadside near Melfort July 31. Conidia were present.

N.S.- Sooty spot was general throughout the province on red clover. In Kings and Cumberland counties, 60 per cent of the foliage was affected in some fields.

DOWNY MILDEW - Perenospora Trifoliorum de Bary

Alta.- Light infections of downy mildew were observed at Edmonton and Wetaskiwin.

P.E.I.- Downy mildew caused moderate damage to the second growth of red clover in Queens county.

MOSAIC - Virus.

Alta.- Occasional plants were affected by mosaic.

N.B.- A few plants were found affected with mosaic at the Experimental Station, Fredericton.

LEAF SPOT and STEM CANKER - Ascochyta Meliloti (Trel.) Davis

Alta.- This disease was found in 10 fields out of 26 examined, infection varying from a trace to light in the affected fields.

MOSAIC - Virus

B.C.- Mosaic was present on 0.5 to 1.0 per cent of the plants of white sweet clover at Summerland.

Alta.- Mosaic is of fairly common occurrence, but apparently causes no damage.

BROWN ROOT ROT - Plenodomas Meliloti Dearn. & Sanford

Alta.- Brown root rot was found in 8 fields in zones 10 and 12 out of 26 examined in the province. The amount of damage was as follows: A trace in 4 fields, slight in 2 fields, and heavy in 2.

SCLEROTINIA ROOT ROT - Sclerotinia Trifoliorum Erikss.

Alta.- This root rot was found in 3 fields out of 26 examined, and caused severe damage in 2. The disease was probably present and did some damage in some of the other fields examined, but it is practically impossible to detect the disease and assess the damage in the fall, when most of these fields were surveyed.

CORN

SMUT - Ustilago Zeae (Beck.) Ung.

B.C.- Corn smut is rare on Vancouver island.

Alta.- A trace of smut was reported near Brooks.

Sask.- A single large gall was the only smut seen on the University plots, Saskatoon.

Ont.- Smut was prevalent on sweet corn, destroying the ears in the experimental blocks at the Vineland Station. It was also prevalent, in Wellington county, where 2 to 8 per cent of the plants were infected in many fields.

Que.- A trace of smut was present on the Experimental Farm, Ste. Anne de la Pocatière. Single fields in Kamouraska and Quebec counties showed 5, and 3-4 per cent infection respectively.

A trace was also found on Golden Bantam at Abbotsford and Waterville.

N.B.- A trace of smut was reported from a field in Victoria county.

RUST - Puccinia Sorghi Schw.

Man.- Rust was abundant on sweet corn at the Agricultural College, Winnipeg.

Que.- Rust was collected at Abbotsford, Waterville, and Ste. Anne de la Pocatière.

P.E.I.- A trace of rust was found on Golden Bantam in Queens county. Rust is not common in the province.

DRY ROT - Diplodia Zeae (Schw.) Lév.

Sask.- Three corn plants, stunted and prematurely bleached, were noted in the University plots, Saskatoon. Pycnidia of this pathogen were found at the base of one of these plants. No ears were formed. This is the first time this disease has been observed in Saskatchewan.

BACTERIAL STALK and EAR ROT

Alta.- This disease was severe in gardens at Edmonton, following a wet, cool period in early August. Infection presumably takes place from the soil as the decay first appears in the root. The disease then spreads to the stalk, leaves, ear and tassel. It resembles the disease described by H. R. Rosen (Ark. Agr. Exp. Sta. Bull. 209, 1926). The rot was also observed at Wetaskiwin, Lacombe and Olds. The causal organism has not been definitely determined.

BROWNING ROOT ROT - Asterocystis radicis Willd.

Sask.- Asterocystis radicis was observed for the first time in corn plants from the field, when it was collected at Saskatoon. (T.C. Vanterpool).

FLAX

WILT - Fusarium Lini Bolley

Sask.- A trace of wilt was found in 2 fields out of 5 examined. In the experimental plots at Saskatoon, Crown was badly diseased, while Bison was resistant to wilt.

Man.- Wilt was found in 2 fields, infection being light and moderate respectively.

RUST - Melampsora Lini (Pers.) Desm.
Man.- A trace of rust was found in 3 fields.

HEAT CANKER - Non-parasitic
Sask.- At the Experimental Farm, Indian Head, 10 per cent of the plants were affected with heat canker in varieties Long-stem, Bison, Buda, Linota, Premost and Crown, while there were only a few dead plants in Novelty.

MANGEL

SOFT ROT - Botrytis sp.
Que.- About 15 per cent of the roots were affected with a storage rot due to a Botrytis at the Experimental Farm, Ste. Anne de la Pocatière.

DRY HEART ROT - Non-parasitic
B.C.- This disease affected a large percentage of the roots in one part of a field at Summerland.

SUNFLOWER

WILT - Sclerotinia Sclerotiorum (Lib.) de Bary
Alta.- Wilt was observed in 3 fields, but most stands were apparently free. It caused 10 per cent damage in one field at Strathmore.

N.B.- The disease was severe in a garden patch in York county. The damage was 50 per cent.

N.S.- Affected plants were found in only 3 fields. Up to 20 per cent of heads were diseased in the pure line selections at Kentville in October.

RUST - Puccinia Helianthi Schw.
Que.- A light infection of rust was observed in one field in Kamouraska county.

LEAF SPOT - Septoria Helianthi Ell. & Ev.

N.S.- Twenty-five to seventy per cent of the foliage was severely affected in fields in Kings and Cumberland counties. In one field the leaves were practically all wilted or dead.

CULTIVATED GRASSES

AWNLESS BROME (Bromus inermis)

Leaf spot (Septoria bromigena Sacc.) was fairly common in Alberta, heavy infections sometimes being present. In Saskatchewan, the disease was observed only once.

Scald (Rhynchosporium Secalis (Oud.) Davis) was rather common and often severe in Alberta.

Ergot (Claviceps purpurea (Fr.) Tul.) occurs frequently and is sometimes severe in Alberta. It was found this year in zones 9 to 11. A heavy infection of ergot was reported in one field in Manitoba.

A leaf spot, apparently caused by bacteria, was found in a field in Alberta. Bacteria were abundant in the exudate formed on many of the spots.

BROOM MILLET (Panicum mileaceum)

Smut (Sorosporium Panici-mileacei (Pers.) Takah.) was prevalent in one field of broom millet in Manitoba.

TIMOTHY

Stem rust (Puccinia graminis Pers. var. Phlei-pratensis (Erikss. & Henn.) Stakm. & Piemeisel) was general on Vancouver island, B.C.

Rust was common in Alberta; slight to severe infections were found in zones 9 and 10.

A slight infection was present on late plants in Kings county, N.S.

Slight to moderate infections were observed on both cultivated strains and wild plants in Queens county. P.E.I. The damage was insignificant.

Ergot (Claviceps purpurea (Fr.) Tul.) was found at Hobbema and Lacombe, Alta.

Leaf Spot (Heterosporium Phlei Gregory) was reported as general on Vancouver island.

WESTERN RYE GRASS (Agropyron tenerum)

Ergot (Claviceps purpurea (Fr.) Tul.) was noticed occasionally in zones 9 and 10, in Alberta.

Smut (Ustilago bromovora (Tul.) Fisch.) caused severe damage in some cultivated stands in Alberta. The three highest infections were: Strathmore, 90 per cent; Vermillion, 50; and Lacombe, 25. Smut was found occasionally on the wild grass in zones 4, 6, 9 and 10.

This smut was sent in for identification from Robinhood, Sask. The severity of the infection was not reported.

Dying-off (Cause unknown). Seed was sown in rows in the University plots, Saskatoon, Sask. in 1930 and growth began well the next spring, but by May 29 a large portion of the rows were dead. Such severe damage has not been noticed previously. (T. C. Vanterpool).

LAWN GRASSES

Snow Mould (Cause unknown) was observed forming patches on the lawns in the University campus and in the City gardens, Saskatoon, Sask. The damage was slight. The injury appears to be similar to what was common around Montreal, Que., in the springs of 1926 to 1928. However, the Typhula-like sclerotia (0.5 to 1 mn. in diam.) were not found at Saskatoon, while they were common at Montreal. (T.C. Vanterpool).

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 or 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. graveolentis 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 $\frac{1}{2}$ 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).

IV. DISEASES OF FRUIT CROPS

APPLE

SCAB - *Venturia inaequalis* (Cke.) Wint.

B.C.- Scab is general on Vancouver island and in the lower Fraser valley.

Climatic conditions prevailing throughout the season were such that scab was severe only in the Salmon Arm district. However, losses were slight as a regular spray schedule is always carried out. In the Okanagan valley scab was not serious even where the trees were not sprayed. McIntosh and Wealthy were the most severely attacked.

The results of counts made on unsprayed trees in the Kootenay Lake district were furnished by Mr. J. W. Eastham: Granenstein, of 243 apples on entire tree, 96.7 per cent were scabby; McIntosh Red, 1219 apples, 99.3 per cent scabby; Rome Beauty, 377 apples, 93.1 per cent scabby.

Ont.- Apple scab was very prevalent in Wellington county this year. In some instances 100 per cent of the fruit and leaves were infected on unsprayed trees of susceptible varieties such as McIntosh and Baxter. In Leeds and Grenville counties scab was also very serious, 60 per cent of the fruit and leaves being infected on unsprayed trees.

In the Niagara peninsula scab was about as prevalent as in 1930. In one unsprayed orchard, 40 per cent of leaves and 30 per cent of the fruit were infected. In sprayed orchards the trees were quite free from infection. The ascospores were first discharged on May 7 in the Laboratory orchard, St. Catharines.

In Carleton county, in an orchard, where the calyx spray was delayed on account of bad weather, scab infection was as follows: McIntosh, 50 per cent on the foliage, 25 per cent on the fruit; Fameuse, 20 and 30 per cent; Wealthy, 10 per cent on the foliage; and Lobo, 25 per cent.

Que.- Scab was especially prevalent on McIntosh and Fameuse in western part of Quebec. The season was very favourable for scab development. Nearly all commercial orchards were sprayed. In 95 per cent of those orchards, where the number of sprays advised by the "Quebec Spray Service" was applied, scab infection varied from a trace to 10 per cent. In those where one or two sprays were omitted, scab ran from 10 to 50 per cent. In unsprayed orchards 100 per cent of the fruit was usually scabby.

Sepal infection was the most common and late infections were especially noticeable in orchards near the St. Lawrence river.

Perithecia were mature on April 24; following a rain, the first discharge was noticed on April 28-29; the heaviest discharge occurred on May 12-13. (F.L. Godbout)

In eastern Quebec in Kamouraska, L'Islet, and Montmagny counties, infections on the fruit of several varieties varied from one to 20 per cent.

N.B.- In the lower St. John valley scab was severe, chiefly on McIntosh and Fameuse, while in the upper St. John, infection was light.

N.S.- Heavy infections were general on fruit and leaves in Nova Scotia. Unsprayed trees in many orchards were defoliated by August. First ascospore discharge took place on May 9 and conidia were found on foliage lesions on May 25. The weather was very favourable for scab development, the early part of the season being similar to 1925. (J.F. Hockey)

P.E.I.- Scab caused slight to severe damage on McIntosh and Gravenstein in Queens county. In unsprayed orchards scab was common and destructive; in carefully sprayed orchards only traces were present.

FIRE BLIGHT - Bacillus amylovorus (Burr.) Trev.

B.C.- Fire blight was very common in many sections of the Okanagan valley on susceptible varieties such as crab, Spitzenburg, Wealthy, Jonathan, etc., but it caused no serious loss. The disease has not been recognized on Vancouver island or in the lower Fraser valley.

Man.- Fire blight was fairly destructive despite a dry spring.

Ont.- In general, fire blight caused light infections in the Niagara peninsula. A conspicuous outbreak of the disease occurred in a small orchard of Greening apples in Lincoln county. It caused general twig infection.

Que.- Fire blight was prevalent throughout the province in 1931, being more widespread than in 1930, but less severe, causing very little damage. Very few orchards were free from the disease, but most of them had only a trace. It was severe in a block of Alexander at St. Hilaire, and severe in one and moderate in another at Abbotsford; moderate in a block of Fameuse at Hemmingford; and

severe in a few small orchards of mixed varieties in eastern Quebec. Fire blight occurred almost entirely as twig infection. Blossom infection was observed only at Abbotsford and Franklin Centre. At Abbotsford it occurred in patches on three Fameuse trees; it was severe on a Queen's Choice crab; and present in moderate amounts on Alexander. At Franklin Centre it was severe on one Golden Russet, two King, and a few Fameuse trees. The varieties most severely infected were Winter Arabka, Alexander, and crab apple.

Observations made at Lennoxville on a number of varieties showed Golden White to be severely affected, Joyce moderately so, and Lawfam, Atlas, Lobo, Choata, and Niobe slightly infected.

P.E.I.- Fire blight caused slight to moderate damage to the twigs in an orchard of Golden Russet in Queens county.

BLACK ROT - Physalospora malorum Shear
(Sphaeropsis malorum Pk.)

Sask.- Black rot apparently caused the death of a few limbs in the University orchard, Saskatoon. The pycnidial stage was abundant on the twigs of certain trees. What was probably the perfect stage was present on July 28, but the perithecia were very immature.

Ont.- A scattered infection of black rot was found on Baldwin apples in an orchard in Lincoln county. Although McIntosh, Wealthy, Duchess, and Greening trees were growing in the same orchard, no disease was found on them.

Que.- A trace of black rot was noticed in the experimental orchard at Ste. Anne de la Pocatière.

CORKY CORE - Physiological

B.C.- Corky core was much less severe in the Okanagan valley than last year, when it was estimated that 200,000 boxes were affected.

Ont.- Ninety per cent of fruit was worthless on account of corky core in an orchard of Talmon Sweet, Delicious, Duchess, and Northern Spy in Welland county.

DROUGHT SPOT - Physiological

B.C.- Drought spot was exceedingly severe in the Okanagan valley; its occurrence has meant the total loss of crop in many

orchards. The loss is difficult to estimate, but it certainly amounts to many thousands of boxes. It was extremely abundant on Jonathan and McIntosh Red at the Experimental Station, Kelowna. It was not general at Penticton, but it is on the increase.

PHYSIOLOGICAL BREAKDOWN

Que.- A breakdown in Fameuse apples occurred in one orchard at Oka. About 90 per cent of the crop was affected. The surface of affected fruit was uneven, but the epidermis was intact and of normal colour. When cut open, the fruit showed brown spots of broken-down tissue. At first these spots were found only near the epidermis, but later in the season they were present throughout the apple, their number depending on the severity of the disorder. The first specimens collected greatly resembled the illustrations of heat injury by Brooks and Fisher (Figs. 1 and 2, Plate 1, Journ. Agr. Res. 32:1-26. 1926), except that the broken-down tissues were not so continuous nor so near the epidermis. In later collections the specimens resembled those illustrated by McAlpine (Figs. 45 and 46, Plates 9 and 10, Bitter Pit Investigations, First Report, 1911-12). As the season was hot and the precipitation below normal, the trouble may be due to a combination of drought and heat injury.

DIE-BACK - Physiological

B.C.- Die-back was not exceptionally severe in the Okanagan valley and it occurred only in those orchards that had previously been suffering from the trouble.

DIE-BACK

Sask.- Die-back was responsible for considerable damage to the trees in the University orchard, Saskatoon. It is impossible to decide whether the limbs were killed by severe winter conditions or by Cytospora sp. The pycnidia of the fungus were plentiful on the dead limbs.

RUST - Gymnosporangium clavipes Cke. & Pk.

Que.- Slight damage was caused by rust in Kamouraska county. The identification of the fungus was confirmed by Dr. G.R. Bisby (J.G. Coulson)

N.S.- In the Annapolis valley one to 2 per cent of the fruit were marked by rust.

FROST CURL

B.C.- Frost caused considerable curling of the leaves at Penticton. The injury was most severe on Jonathan.

POWDERY MILDEW - Podosphaera leucotricha (Ell.& Ev.) Salm.

B.C.- Powdery mildew was general on Vancouver island and in the lower Fraser valley. Only in isolated sections was the damage significant.

There has been a distinct increase in the prevalence of powdery mildew this season. It was present in practically every orchard in the Okanagan valley and it did considerable damage by marking the fruit in the Penticton district. In the experimental spray blocks at Summerland, 30 per cent of the apples on the unsprayed trees had to be culled out on account of surface markings. Jonathan, Wagener and Yellow Transparent were the most susceptible varieties.

N.B.- Almost 3,000 trees were all heavily infected with powdery mildew in a nursery in York county.

ANTHRACNOSE - Neofabrea malicorticis Jackson

B.C.- Anthracnose was general on Vancouver island and in the lower Fraser valley. The damage was severe and greater than in 1930.

The disease was not prevalent except in neglected orchards, or those near water or in moist locations at Salmon Arm.

CROWN ROT - Physiological

B.C.- Where control measures have not been adopted, crown rot is steadily on the increase in the Okanagan valley. The percentage of trees affected can not be stated for large areas as a survey has not been possible. In certain badly affected orchards, as high as 25 per cent of the trees were diseased. Spitz, King, Winesap and Cox Orange are very susceptible although no variety appears to be resistant.

TWIG BLIGHT - Nectria cinnabarina (Tode) Fr.

Que.- The fungus was found at Abbotsford, fruiting on the bark of a dead stump where the branch had been pruned off.

N.S.- A slight amount of twig blight was found on Ben Davis and Rome Beauty in Kings county.

SOOTY BLOTCH - Gloeodes pomigena (Schw.) Colby

N.S.- A trace of sooty blotch was seen in Kings county.

P.E.I. - A slight amount of sooty blotch was present in Queens county.

FLY SPECK - Leptothyrium Pomi (Mont.& Fr.) Sacc.

N.S. - A trace of fly speck was found in Kings county.

HEART ROT - Pleurotus areolatus

N.S.- Pleurotus areolatus has only been found on apple trees affected with heart rot in Kings county. It is not known whether the fungus is the primary cause.

EUROPEAN CANKER - Nectria galligena Bres.

B.C.- European canker was found at Port Alberni, V.I. It is apparently rare.

N.S.- European canker was found in a few poorly cared for orchards of King, Nonpareil, and Wagener in Kings and Annapolis counties. The control of this canker is apparently connected with that of the green apple bug. The disease is on the decrease.

FROG-EYE SPOT - Cause undetermined

Rather extensive observations were made on frog-eye spot at Abbotsford, Que., and Manotick, Ont. At Abbotsford, frog-eye spot was found as follows: Wealthy, 3 to 4 spots per leaf; Fameuse, 2 spots per leaf; Golden Russet, slight infection; Yellow Transparent, a trace. At Manotick, the disease was recorded as follows: Lobo, most severely affected, 5 to 6 spots per leaf on the average; Wealthy, 4-5 spots per leaf; McIntosh, slight infection; Fameuse and Melba, traces. A microscopic examination of affected leaves, collected late in the season, showed that Coniothyrium pirinum (Sacc.) Sheld. was the most abundant fungus, all varieties being affected except Lobo. The spots on the latter variety yielded Cladosporium herbarum (Pers.) Lk. only. Other fungi found fruiting on the leaves were: Phyllosticta limitata Pk., and Phyllosticta sp. Spots, which were not in fruit, were cultured and yielded the following fungi: Alternaria sp. (not A. Mali), Cladosporium sp., and 3 unidentified fungi. Neither in the sections, nor in culture has Sphaeropsis Malorum been observed, although this fungus has been shown to be the causal agent of frog-eye spot in other places. Infection experiments with the fungi isolated have not been made (H.N. Racicot & A.S. Hill).

PINK ROT - Tricothecium roseum Lk.

P.E.I.- Where apple scab was present this disease had already appeared on stored fruit by October.

SILVER LEAF - Stereum purpureum (Pers.) Fr.

Que.- A trace was found in the experimental orchard, Ste. Anne de la Pocatière.

BITTER PIT - Non-parasitic

B.C.- Bitter pit was found on large size fruit at Summerland. Wealthy was the most susceptible variety.

Que.- Five per cent of the apples were affected with bitter pit, after being put in storage at Ste. Anne de la Pocatière.

BITTER ROT - Glomerella cingulata (Stonem.) Spauld. & v. Schrenk (Gloeosporium fructigenum Berk.)

B.C.- Bitter rot was found at Gordon Head, V.I.

Que.- A trace of bitter rot was found on several varieties in the experimental orchard, Ste. Anne de la Pocatière.

SPOT SCALD - Non-parasitic

N.S.- Spot scald developed on fruit exposed to light after being previously stored for 4 to 6 weeks. It was apparent only on fully matured fruit.

SUN SCALD - Non-parasitic

B.C.- Sun scald was most severe on old trees, which were being top worked at Penticton, Summerland, and Kelowna. It was also severe later in the season on heavily laden trees of Winter Banana, Permaine, and Wagener at Penticton.

Ont.- Sun scald disfigured 5 per cent of the fruit on Duchess and Wealthy in an orchard in Lincoln county; McIntosh was not affected.

FRUIT ROT - Botrytis cinerea Pers.

B.C.- Fruit rot due to Botrytis cinerea was found occasionally on Vancouver island. The damage was slight.

APRICOT

DROUGHT SPOT and PHYSIOLOGICAL SHOT-HOLE

B.C.- This disease was not serious in the Okanagan valley and was confined to certain orchards, where cultural conditions were poor.

BLACKBERRY

ORANGE RUST - Gymnoconia Peckiana (Howe) Trotter

Ont.- Five per cent of plants were affected with rust in a planting of Eldorado in Lincoln county. In another plantation also in Lincoln county, about 5 per cent of the plants were rusted. This plantation had been carefully rogued every year. The owner said he would never plant blackberries again on account of the rust. Otherwise the crop would be a good paying one. Rusted specimens were submitted for identification from Whitby.

Que.- This rust has been observed every year for the past five years in southern Quebec. It caused no commercial damage. This year a collection was made at Huntingdon.

LEAF SPOT - Mycosphaerella Rubi Roarck. (Septoria Rubi Westend.)

B.C.- Septoria leaf spot was general on Vancouver island. The damage was slight.

N.S.- Leaf spot caused slight defoliation in two plantations in Kings county.

CANE BLIGHT - Leptosphaeria Coniothyrium (Fuck.) Sacc. (Coniothyrium Fuckelii Sacc.)

B.C.- Cane blight is general on Vancouver island and in the lower Fraser valley. The damage is slight on Himalayan, the principal commercial variety.

CROWN GALL - Pseudomonas tumefaciens (E.F.Sm. & Towns.) Duggar

B.C.- Crown gall is general on Vancouver island and in the lower Fraser valley. The damage is slight.

FRUIT ROT - Botrytis cinerea Pers.

B.C.- Fruit rot due to Botrytis does slight damage on Vancouver island and in the lower Fraser valley.

BLUEBERRY

WITCHES' BROOM - Calyptospora Goeppertiana Kühn
(C.columnaris (Alb. & Schw.) Kühn)

N.S.- Witches' broom was found in Kings and Yarmouth counties on both wild and cultivated species. As high as 5 per cent of the plants may be affected. Apparently it is possible to find specimens over most of the western half of Nova Scotia.

LEAF RUST - Thekospora Vacciniorum Karst.

Que.- This rust was collected on cultivated plants of high bush blueberries at Pointe du Lac.

CANKER - Godronia Cassandrae Pk.
(Fusicoccum putrefaciens Shear.)

Que.- Branches of high bush blueberry were found to bear cankers near the base, on which was fruiting Fusicoccum putrifaciens Shear. This material was collected in a plantation of about 50 plants representing a dozen varieties imported from White Bog, N.J. The plants were growing in a depression in the garden, which was very sandy, but where the blueberries were located the soil contained some muck.

The plants are attacked near the base. One branch after another dries up and dies until the plant is killed. About 15 plants have died in two seasons. Dr. N. E. Stevens, Washington, D.C., confirmed the identification. This organism causes a destructive end-rot of the cranberry, but this is the first time it has been observed on the high bush blueberry. (Vaccinium corymbosum L.) (H.N. Racicot & A.S. Hill).

CHERRY

SHOT HOLE - Coccomyces hiemalis Higgins
(Cylindrosporium hiemalis Higgins)

Ont.- Shot hole was not at all common at Vineland Station.

Que.- Some shot hole was found in two orchards in Kamouraska county.

N.B.- A few trees were slightly affected with shot hole in York county.

N.S.- Shot hole caused 10 to 20 per cent defoliation in Kings county. Unsprayed trees are likely to be heavily defoliated.

P.E.I.- Both wild and cultivated cherries were heavily defoliated in Queens county.

POWDERY MILDEW - Podosphaera Oxyacanthae (Fr.) de Bary

Ont.- Powdery mildew caused slight damage to an orchard of Montmorency cherries in Lincoln county.

BROWN ROT - Sclerotinia americana (Worm.) Nort. & Ezekiel

N.S.- Blossoms, leaves, and twigs of Morillo cherries were killed by brown rot in Kings county, 20 per cent of twigs died back a distance of one to 18 inches.

BLACK KNOT - Dibotryon morbosum (Schw.) Theiss. & Syd.

Que.- Black knot was noted on cultivated cherry in L'Islet county. It was also reported from three orchards in Kamouraska county. Knot was severe on wild cherries.

YELLOW LEAF - Non-parasitic

Ont.- In an orchard of 1000 sour cherry trees at Ridgeville, the upper branches of all trees were severely defoliated. The orchard is well cultivated; the trees are underpruned.

DROUGHT SPOT and PHYSIOLOGICAL SHORT HOLE

B.C.- This disease was noted at Naramata, Penticton, and Summerland.

CURRANT

WHITE PINE BLISTER RUST - Cronartium ribicola Fischer

B.C.- White pine blister rust is general on Vancouver island and in the lower Fraser valley.

Ont.- A heavy infection of white pine blister rust occurred on a plot of black currants across the road from a stand of white pine at Vineland Station. It caused severe defoliation in a planting of Boskop in Lincoln county. Victoria proved to be more resistant. The rust also caused severe defoliation late in the season in a planting of Topsy at Manotick

Que.- This rust caused severe defoliation of the black currant bushes at Cap Rouge, only about six young leaves remained at the tip of each shoot. The rust also caused defoliation at other places as follows: Neuville, severe; Beebe, moderate. Early in the season wild Ribes were inspected for rust about Hull. Scattered infections bearing uredinia were present on all the bushes examined.

N.B.- White pine blister rust is common on both wild and cultivated Ribes throughout the province.

P.E.I.- A heavy infection of this rust was found on red currant in Queens county. It caused serious defoliation. The rust was also observed in Prince and Kings counties.

SEPTORIA LEAF SPOT - Mycosphaerella Grossulariae (Fr.) Lindau (Septoria Ribis Desm.)

Sask.- This leaf spot developed rapidly in the University gardens, Saskatoon, from Oct.1 to 10. It appeared to cause premature defoliation.

P.E.I.- Septoria leaf spot caused some leaf drop on black currant in Queens county.

GLOEOSPORIUM LEAF SPOT - Pseudopezaza Ribis Kleb. (Gloeosporium Ribis (Lib.) Mont. & Desm.)

Que.- Gloeosporium leaf spot caused 75 per cent defoliation in a patch of red currant in Iberville county.

P.E.I.- This leaf spot was common in Queens county, but it caused little damage.

POWDERY MILDEW - Sphaerotheca mors-uvae (Schw.) Berk. & Curt.

B.C.- Powdery mildew was general on Vancouver island.

Alta.- Powdery mildew caused severe damage to both red and black currants in a garden at Edmonton.

Sask.- The young growing tips of black currant were rather severely damaged by powdery mildew in the University garden, Saskatoon.

In a garden protected by a windbreak of trees on three sides, black and red currants were slightly damaged by powdery mildew. Perithecia were forming well on the stems.

Ont.- Powdery mildew was prevalent on black Maple currants in a plantation in Lincoln county. The damage was slight.

GOOSEBERRY

WHITE PINE BLISTER RUST - Cronartium ribicola Fischer

B.C.- White pine blister rust is general on gooseberry on Vancouver island.

Que.- A very slight infection of this rust was found on gooseberry at Cap Rouge.

GLOEOSPORIUM LEAF SPOT - Pseudopeziza Ribis Kleb.
(Gloeosporium Ribis (Lib.) Mont. & Desm.)

Que.- This leaf spot caused about 90 per cent defoliation of the cultivated American gooseberry in a garden at Iberville.

P.E.I.- Traces of Gloeosporium leaf spot were found in a garden in Queens county.

CLUSTER CUP RUST - Puccinia Pringsheimiana Kleb.

B.C.- This rust was found at Saanichton. The damage was slight.

Que.- Specimens of rusted gooseberry leaves were received from Ste. Anne de la Pocatière.

N.S.- Cluster cup rust infected the leaves moderately and the fruit slightly in a plantation in Yarmouth county.

GRAPE

BLACK ROT - Guignardia Bidwellii (Ell.) Viala & Rav.

Ont.- Black rot infection varied considerably in the peninsula. In some vineyards 5 per cent of the fruit in the bunch was infected while in others only a trace was attacked. Where the vines were sprayed rot was of no importance.

DOWNY MILDEW - Plasmopara viticola (Berk. & Curt.) Berl. & de Toni

Ont.- The foliage was severely infected with downy mildew. In unsprayed vineyards considerable damage occurred on account of shelling of the fruit.

CROWN GALL - Pseudomonas tumefaciens (Sm. & Towns.) Duggar

Que.- Specimens of crown gall on grape were received for identification from Arthabaska county. The vines were of the "Beta" variety, and had been purchased from a nursery at Taylor's Falls, Minn.

LOGANBERRY

CROWN GALL - Pseudmononas tumefaciens (Sm. & Towns.) Duggar
B.C.- Crown gall was general on Vancouver island and in the lower Fraser valley. The damage was severe.

FRUIT BLIGHT - Botrytis cinerea Pers.
B.C.- Fruit blight caused severe damage on Vancouver island and in the lower Fraser valley.

CANE BLIGHT - Leptosphaera Coniothyrium (Fuck.) Sacc.
(Coniothyrium Fuckelii Sacc.)
B.C.- Cane blight is general and very serious on Vancouver island.

SPUR BLIGHT - Didymella applanata (Niessl) Sacc.
B.C.- Spur blight was found at Saanichton. The damage was slight.

BLOSSOM BLIGHT - Cause undetermined
B.C.- Blossom blight is destructive in the Elk Lake, Royal Oak, Keating, and Saanichton districts on Vancouver island. It caused a loss of about 30 per cent of the crop. Foster (Scient. Agric. 11:529-534. 1931) reported Bacillus dessicans n. sp. as the cause of this disease. More recent study indicates that thrip injury is the primary cause, but thrips alone are unable to produce any serious damage. Besides Bacillus dessicans several other bacteria have been isolated from blighted blossoms and fruit and their pathogenicity tested. It appears that some of these organisms may be more pathogenic than Bacillus dessicans (W. Newton).

ORANGE

STEM-END ROT - Diplodia natalensis Pole-Evans
Que.- This rot is causing serious damage to oranges shipped from Jamaica. Five to 50 per cent of the fruit is affected on its arrival by boat in Montreal (J.G. Coulson).

PEACH

SCAB - Cladosporium carpophilum Thüm.
Ont.- Peach scab was less prevalent than in 1930 in the Niagara peninsula. Thirty to 40 per cent of the fruit was

infected in an unsprayed block of Rochester in Lincoln county, but only 4 per cent was severely affected. Elberta was quite free from infection.

LEAF CURL - Taphrina deformans (Berk.) Tul.

B.C.- Leaf curl was general on Vancouver island. The damage was severe.

Ont.- Leaf curl was general and quite prevalent in unsprayed orchards in the Niagara peninsula. Ten per cent or more of the leaves were affected especially on Elberta. Where the trees were sprayed, infection was very light. Infection apparently occurred about 2 weeks after the buds had opened.

POWDERY MILDEW - Sphaerotheca pannosa (Wallr.) Lév. var. Persicae Woron.

B.C.- Powdery mildew was not abundant, but it was severe on Triumph and New Haven varieties at Summerland.

BROWN ROT - Sclerotinia americana (Worm.) Nort. & Ezekiel

Ont.- A scattered infection of brown rot was present in a block of Red Bird peach in Lincoln county. The damage was slight.

BLIGHT - Coryneum Beijerinckii Oud.

B.C.- Blight is general on Vancouver island. The damage is slight.

PEAR

FIRE BLIGHT - Bacillus amylovorus (Burr.) Trev.

B.C.- Fire blight was kept fairly well in check in most districts of the Okanagan valley through the work of the Extension Service of the Provincial Department of Agriculture. In the Westbank area, however, a serious outbreak occurred and as a result several orchards were practically wiped out.

Ont.- Fire blight caused considerable twig blight and in many instances branches and limbs were also involved. In the young Barlett orchard at the Laboratory, St. Catharines, infection was severe. It also caused a moderate amount of twig blight on Flemish Beauty at Abbotsford, Que.

SCAB - Venturia pyrina Aderh.

B.C.- Scab was general on Vancouver island; the damage was severe.

Ont.- Eighty per cent of the fruit was infected and severely damaged in a block of six Flemish Beauty trees in Lincoln county. The twigs and leaves were affected moderately and slightly respectively.

N.S.- Scab was very common in Kings county, 100 per cent of the fruit being infected in several varieties.

P.E.I.- A small percentage of fruit were severely damaged in an orchard of Flemish Beauty in Queens county.

DROUGHT SPOT - Non-parasitic

B.C.- Drought spot was found on Bartlett and Flemish Beauty at Penticton. It is not very prevalent, but it is on the increase.

BLACK END ROT - Non-parasitic

B.C.--Black end rot has increased slightly in the Penticton area, but it is not of serious economic importance.

CORKY CORE - Non-parasitic

B.C.- Corky core was found on several varieties at Summerland.

DIE BACK - Non-parasitic

B.C.- A number of trees were affected with die back in an orchard at Westbank. The buds had opened and then dried up; the dead leaves remained in position. In some instances the wood was alive and new leaves had come out; in others the wood was dead and the cambium had darkened.

POWDERY MILDEW - Podosphaera leucotricha (Ell. & Ev.) Salm.

B.C.- Powdery mildew appears to be somewhat on the increase as it was reported as affecting fruit from different sections. It was found on one tree of Pyrus ussuriensis in the Laboratory grounds, Summerland. Mildew was severe on the fruit of Bartlett and Flemish Beauty at Penticton.

PLUM

BLACK KNOT - Dibotryon morbosum (Schw.) Theiss. & Syd.

Que.- Black knot was severe on plums at Ste. Famille, Isle of Orleans. It was noticed in six orchards in Kamouraska county, 5 to 75 per cent of the trees bearing knots. The disease is present on 75 per cent of the wild plum trees along the roadsides on the

islands of Montreal and Jesus. The disease is affecting the ornamental value of these trees.

N.B.- Black knot is common on wild plum throughout the province. Slight infections occur also on cultivated plum.

N.S.- Black knot was noticed in a well cared for orchard at Kentville.

P.E.I.- Black knot caused slight damage in an orchard in Queens county. The disease is becoming less troublesome in well cared for orchards.

PLUM POCKETS - Taphrina Pruni (Fuck.) Tul.

Man.- Plum pockets was almost absent at Winnipeg in 1931.

Que.- Out of ten trees, four were badly infected with plum pockets in Kamouraska county.

N.S.- Half the fruit was destroyed on some unsprayed trees in Annapolis county.

BROWN ROT - Sclerotinia americana (Worm.) Nort. & Ezekiel

B.C.- Brown rot caused slight damage on Vancouver island.

Ont.- Brown rot was mere prevalent than in 1930 on stone fruits in the Niagara peninsula. No counts were made to determine the percentage of rot, but infected fruit could easily be found. Brown rot apothecia were first observed on May 4 and could be found easily on May 14.

N.S.- Up to 10 per cent of the fruit was affected by brown rot on varieties of Prunus domestica and prunes in Kings county.

P.E.I.- Brown rot was severe on one tree out of three in a garden at Charlottetown.

SHOT HOLE - Coccomyces prunophorae Higgins
(Cylindrosporium prunophorae Higgins)

B.C.- Shot hole is general on Vancouver island, but the damage is slight.

Ont.- Shot hole caused some defoliation in an orchard of prunes in Lincoln county.

Que.- A moderate infection of shot-hole was present on Damas plums at Ste. Anne de la Pocatière.

SCAB - Cladosporium carpophilum Thüm.

Que.- Fruits sent in for examination from Frontenac county were found to be affected with scab. The owner stated that his plums had dried up just as they were ripening for the last two or three years.

BACTERIAL SPOT - Pseudomonas Pruni E.F.Sm.

Ont.- This disease was observed on two neighbouring farms in Lincoln county. On one farm the disease was very prevalent, rendering the fruit useless and causing considerable shot hole and defoliation.

GUM SPOT - Non-parasitic

B.C.- Gumming accompanied by an internal necrosis has been more serious this year than usual in plums in the Okanagan valley. The loss over the whole area is difficult to estimate, but in certain orchards approximately all the fruit was unmarketable on account of the gumming.

PLUM LUMP - Non-parasitic

B.C.- In some orchards about Summerland 100 per cent of the fruit was affected.

BLACK ROT - Physalospora malorum Shear
(Sphaeropsis malorum Pk.)

Sask.- A small amount of the imperfect stage was found on plum at Saskatoon.

DIE BACK - Valsa ambiens (Pers.) Fr.
Cytospora ambiens Sacc.

Sask.-Both stages of the fungus were found on plum. The fungus was identified by Dr. Dearness.

QUINCE

LEAF BLIGHT - Fabraea maculata Atk.
(Entomosporium maculatum Lév.)

Ont.- Leaf blight was severe on quince at Jordan in 1930.

RUST - Gymnosporangium clavipes Cke. & Pk.

N.S.- Less than one per cent of the fruit and leaves were affected in an orchard in Kings county. The trees were well sprayed with sulphur fungicides.

RASPBERRY

SPUR BLIGHT - Didymella applanata (Niessl) Sacc.

Man.- Spur blight is common and causes some injury in Manitoba.

Ont.- Traces of spur blight were found on Latham, Viking and Newman at Manotick.

N.B.- Slight to moderate infections of spur blight were noted throughout the plantations in the province.

P.E.I.- Spur blight causes heavy losses in Queens county.

MOSAIC - Virus

B.C.- Mosaic was general on Vancouver island; over 50 per cent of the plants were affected.

Alta.- Both mosaic and leaf curl, especially the former, occur in many of the raspberry plantations in the province. Sometimes the damage is severe.

Ont.- Mosaic was found to be general in plantations inspected in York, Peel, Halton, Lincoln, Wentworth, Welland, Norfolk, Elgin, Huron, and Brant counties. The disease is more prevalent in Cuthbert, Viking, and King varieties. (G.C. Chamberlain). At Manotick the following percentages of mosaic were noted: Cuthbert, 20-25 per cent; Viking (2 plantings) 3 per cent and a trace; Newman, a trace.

N.B.- Mosaic infected 20 per cent of the plants at the Experimental Station, Fredericton. The disease is common on wild raspberries throughout the province.

P.E.I.- The following percentage of infected plants were reported in Queens county: Herbert, a trace to 100 per cent; Viking, a trace only.

LEAF CURL - Virus

Ont.- Leaf curl was found scattered throughout Lincoln, Brant, Middlesex, Elgin, Halton, Welland, and York counties.

The percentages of infection were small.

N.B.- Leaf curl was common on wild and cultivated raspberries throughout the province. The damage was severe.

ANTHRACNOSE - Plectodiscella veneta Burkh.
Gloeosporium venetum Speg.

Ont.- Anthracnose was prevalent in a planting of Black Perfection in Lincoln county; the damage was slight. Fifty per cent of the canes showed a trace and 10 per cent a moderate infection in a planting of Newman at Manotick. Only a trace was present on Viking.

P.E.I.- A trace of anthracnose was found on Viking in Queens county.

SEPTORIA LEAF SPOT - Mycosphaerella Rubi Roark
(Septoria Rubi Westend.)

Ont.- Specimens of this leaf spot on Herbert were sent in for identification from Sutton West.

Que.- Septoria leaf spot heavily infected 100 per cent of leaves of Herbert in plantations at Emileville and Beebe.

CANE BLIGHT - Leptosphaeria Coniothyrium (Fuck.) Sacc.
(Coniothyrium Fuckelii Sacc.)

B.C.- Cane blight was general and severe on Vancouver island. Diseased canes of Cuthbert were received from Hatzic. The owner says "That two-thirds of the canes have rotted or nearly rotted off. In some places the whole hill has died".

Ont.- Cane blight had affected and killed two per cent of the canes in a planting of Cuthbert in Wentworth county.

Que.- A trace of cane blight was found on Adams 87 at Cap Rouge.

BLUE STRIPE WILT - Verticillium ovatum Berkeley & Jackson
and Verticillium sp. (V. Dahliae group)

Ont.- Blue stem wilt was found scattered throughout Lincoln, Wentworth, and Norfolk counties, on Viking and Cuthbert. Infection varied from 1 to 5 per cent.

N.S.- Wilt affected 1½ per cent of the canes in a planting of Herberts in Kings county.

PUCCINIASTRUM RUST - Pucciniastrum americanum (Farl.) Arth.

Que.- About 30 per cent of the leaves were slightly to moderately affected with this rust in a planting of Viking at Abbotsford.

N.S.- Specimens of rusted leaves of cultivated raspberry were collected at Kentville in 1925. Examination of these leaves showed that they were infected with Pucciniastrum americanum. It is probable that the rust on Viking reported last year as Kuehneola uredinis was this rust. (I.L. Conners and A.S. Hill)

PHRAGMIDIUM RUST - Phragmidium imitans Arth.

B.C.- This rust is general on Vancouver island and is severe in certain districts.

POWDERY MILDEW - Sphaerotheca Humuli (DC.) Burr.

Ont.- Powdery mildew was prevalent on Brighton, Count, and Latham in the Niagara peninsula; it caused some stunting of the growth. Heavy infections were also reported on Latham from Peel and Halton counties.

CROWN GALL - Pseudomonas tumefaciens (Sm. & Towns.) Duggar

Ont.- Crown gall was in general more widespread this season due possibly to the high soil temperatures and frequent showers. In a planting of Latham in Lincoln county 25 per cent of plants were affected; the damage was moderate. Many galls appeared at the surface of the ground choking and killing the affected canes.

DIE BACK - Non-parasitic

B.C.- Die back, apparently caused by a late frost was very general at Summerland, Penticton, and Naramata. There was a considerable reduction of the crop.

HAIL INJURY

Ont.- Hail that fell a week or ten days previous to Sept. 24, severely injured the canes of raspberries at Manotick. The injury had the appearance of anthracnose, except that the hail marks were confined to one side of the cane and were scattered evenly, about two to three inches apart, the whole length of the cane.

BLOSSOM BLIGHT - Cause undetermined

B.C.- Blossom blight caused severe damage to Franconia, an English variety, in certain districts on Vancouver Island.

Cuthbert is practically immune in the field.

SANDCHERRY

POWDERY MILDEW - Podosphaera Oxyacanthae (Fr.) de Bary

Sask.- A fairly heavy infection of powdery mildew was present on some of the bushes of sandcherry in the University orchard, Saskatoon, on Sept. 29. Perithecia were abundant.

DIE BACK - Valsa ambiens (Pers.) Fr.
(Cytospora ambiens Sacc.)

Sask.- A little Valsa ambiens along with Cytospora ambiens was found on sandcherry. Determinations were made by Dr. Dearness (R.C. Russell).

STRAWBERRY

LEAF SPOT - Mycosphaerella Fragariae (Schw.) Lindau
(Ramularia Tulasneii Sacc.)

Sask.- A light infection of the conidial stage was present on cultivated strawberries in the University garden, Saskatoon.

Ont.- Leaf spot was reported but caused little damage in Lincoln and Carleton counties.

Que.- Medium to heavy infections of leaf spot were reported from Western Quebec. In some cases it caused heavy defoliation and thus decreased the yield. Leaf spot was general from Quebec to Riviere du Loup, 25 to 50 per cent of the leaf surface being infected.

N.B.-Leaf spot was widespread in the province. The damage was slight.

N.S.- Leaf spot was present in Annapolis and Halifax counties; it apparently caused no damage.

P.E.I.- Leaves of Senator Dunlop were moderately infected in Queens county; the damage was practically nil.

POWDERY MILDEW - Sphaerotheca Humuli (DC.) Burr.

Ont.- Powdery mildes caused slight damage in the Niagara pen-

BLACK ROOT - Cause undetermined

Ont.- Twenty-five per cent of the plants were affected with black root on May 22 in a patch of Parson's Beauty. The old plants were dying. The young plants were as yet apparently healthy.

LEAF SCORCH - Diplocarpon Earliana (Ell. & Ev.) Wolf
(Marssonina Fragariae (Sacc.) Kleb.)

Ont.- Leaf scorch was unusually common in the district around Vineland Station.

V. DISEASES OF FOREST AND SHADE TREES

ASH (Fraxinus)

RUST - Puccinia sparganoides Ell. & Barth.

A trace of rust was found on the leaves and peticles of white ash (F. americans L.) in the Provincial Forest Nursery, Berthierville, Que. A single specimen was found on the same host in York county, N.B.

Leaves of white ash were fairly heavily infected with Piggotia Fraxini Berk. & Curt. at Berthierville.

BASSWOOD (Tilia)

POWDERY MILDEW - Uncinula Clintonii Pk.

Powdery mildew was found on baswood leaves near Farmer's Rapids, Que.

BEECH (Fagus)

ROT - Panus stipticus Fr.

Panus stipticus was very common on dying beech at Kentville, N.S.

BUTTERNUT (Juglans)

LEAF SCORCH - Marssonina Juglandis (Lib.) Magn.

Leaf scorch is general on butternut throughout Quebec. It has been observed from Ottawa to Montreal and Quebec City. It was also present east and south of Montreal throughout the Eastern Townships to Sherbrooke, Stanstead, Hemmingford, and Franklin Centre. Specimens were collected and determined from Abbotsford and St. Sulpice (H.N. Racicot).

CEDAR (Cedrus)

The current year's growth of young deodar cedars (Cedrus deodara Laws.) was found killed in a nursery at Vancouver, B. C. on July 15. The conidiophores of a Botrytis were plentiful on dead and dying shoots. The injury may affect the symmetry of growth. The previous month was exceptionally wet.

CHESTNUT (Castanea)

BLIGHT - Endothia parasitica (Murr.) Anders. & Anders.
Stands of the native chestnut (Castanea dentata) were found severely damaged by blight in Welland, Lincoln, and Norfolk counties. Trees were being killed outright by the disease.

ELDER (Sambucus)

Leptosphaeria sambucina Ell. & Ev. was found on elder in the University nursery at Saskatoon, Sask.

ELM (Ulmus)

BLACK SPOT - Gnomonia ulmea (Schw.) Thüm.
Que.- Black spot was collected on slippery elm (Ulmus fulva Michx.) at Lennoxville. Specimens were also observed in the Provincial Forest Nursery, Berthierville. Forty to 50 per cent of the leaves were infected; on 5 per cent the infection was moderate to severe.

N.B.- A trace of black spot was present on elm in York county. Specimens were identified by Dr. Dearness.

BALSAM FIR (Abies balsamea)

WITCHES' BROOM - Melampsorella Caryophyllacearum Schroet.
N.B.- This disease is common throughout the province.

N.S.- Witches' broom was observed in Kings and Annapolis counties. It may be found in most stands of fir in western Nova Scotia.

MAPLE (Acer)

Box Elder (Acer Negundo)
One tree, whose upper limbs were seriously diseased in 1929, is now in a very stunted sickly condition at Saskatoon, Sask. The majority of the younger shoots are dead and bear abundant pycnidia of Sphaeropsis albescens Ell. & Ev. (R.C. Russel).

Septoria Negundinis Ell. & Ev. and Piggotia Negundinis Ell. & Dearn. were collected on leaves at Martinville, Que.

Red Maple (Acer rubrum)

A species of Phoma was found killing the young twigs in Lincoln county.

Norway Maple (Acer platinoides)

One tree was completely defoliated as a result of being affected with wilt (Verticillium sp.)

Silver Maple (Acer saccharinum)

A trace of tar spot (Rhytisma acerinum (Pers.) Fr.) was collected at L'Assomption and Ste. Anne de la Pocatière, Que. It was reported on the same host from Queens county, P.E.I. The disease is common throughout New Brunswick, causing slight damage.

Mountain Maple (Acer spicatum)

Powdery mildew (Uncinula circinata Cke. & Pk. was collected near Farmer's Rapids, Que.

FIRETHORN (Pyracantha)

SCAB - Fusicladium sp.

On a number of occasions the leaves and fruit of Pyracantha coccinea Roem. have been found covered with sooty spots, at Vancouver, B.C. A fungus was present on these spots which is indistinguishable from Fusicladium on apple or pear. The degree of infection is comparable to that of scab on Flemish Beauty pear in a bad season (J.W. Eastham).

HAWTHORN (Crataegus)

FIRE BLIGHT - Bacillus amylovorus (Burr.) Trev.

P.E.I.- Fire blight caused slight damage on C. Oxyacantha var. rosea grafted on a hardy stock at Charlottetown. The disease has been practically eliminated by careful pruning.

RUST - Gymnosporangium clavariaeforme (Jacq.) DC.

P.E.I. - This rust caused slight damage to hawthorn in Queens county.

HORSECHESTNUT (Aesculus)

LEAF SPOT - Phyllosticta sphaeropsoidea Ell. & Ev.

P.E.I.- This disease occurs commonly in Prince Edward Island

and frequently causes severe injury during mid-summer. Infection varied from a trace to 60 per cent of the leaf surface.

MOUNTAIN ASH (Sorbus)

FIRE BLIGHT - Bacillus amylovorus (Burr.) Trev.
P.E.I.- Fire blight causes slight to severe damage on both American and European mountain ash. Frequently the trees succumb to the disease.

OAK (Quercus)

LEAF CURL - Taphrina caerulescens (Mont. & Desm.) Tul.
Alta.- Specimens of this leaf curl were collected at Beaverlodge. It caused moderate damage. The fungus was identified by Dr. Dearness.

HEART ROT - Polyporus sulphureus (Bull.) Fr.
N.S.- Heart rot occurs on some trees of red oak year after year at Kentville.

HEART ROT - Polyporus frondosus (Dicks.) Fr.
N.S.- Large clumps of this polypore have been growing at the bases of red oak trees for the past three years at Kentville. In one instance the side of the tree was decayed.

PINE (Pinus)

WHITE PINE BLISTER RUST - Cronartium ribicola Fischer
B.C.- White pine blister rust is evidently well established in the Kootenay Lake district on western white pine. Blister rust scouts of the United States Dept. of Agriculture collected numerous fruiting cankers along the western arm of Kootenay Lake between Nelson and Proctor.

Ont.- This rust was collected on Pinus Strobus L. var. umbraculifera Knight and P. monticola Dougl. in the Arboretum at Ottawa.

Que.- Besides Mr. Pomerleau's report on white pine blister rust (see p.105) the disease was recorded on pine as follows:-

Wychwood and Lac Beauport, specimens received.

Hull, several small pines were found infected in a pasture. One tree, two and a half inches in diameter, was affected at the base.

Deux Montagnes county, rust present for the past two years in a stand of 100,000 pines. Probably it would be worth while to eradicate the Ribes.

Chateauguay, 16 ornamental trees were nearly all dead on account of rust. The trees are 15 years old and they have been affected for at least four years.

N.B.- Only two reports were received from extensive forest areas.

N.S.- The rust is on the increase in western Nova Scotia. In a clump of trees at Kentville, 50 per cent were affected. On May 6, aecia were abundant and shedding spores.

P.E.I.- White pine blister rust caused severe damage in Queens and Prince counties. Many trees have died from rust.

BLISTER RUST - Cronartium Comandrae Pk.

B.C.- One half of one per cent of the young trees of Pinus ponderosa Dougl. were affected with this rust at Summerland. It causes the death of the young trees and is occasionally found on old ones.

Sask.- This rust was found near Macdowall, Sask. on Pinus Banksiana.

NEEDLE RUST - Coleosporium Solidaginis (Schw.) Thüm.

Sask.- The needles of Pinus Banksiana Lamb. were lightly infected near Macdowall, Sask. not far from where the rust was found last year.

NEEDLE CAST - Lophodermium pinastri (Schr.) Chev.

N.B.- Occasional infections of needle cast were noted throughout the province.

N.S.- Needle blight was very prevalent on trees along roads and in the driest parts of the woods at Waterville, Goldbrook, and Kentville. Considerable Lophodermium pinastri was present on fallen needles. It is thought that the drought of 1930 may have been an important factor in causing the death of the needles.

POPLAR (Populus)

CANKER - Hypoxylon pruinatum (Klotzsch) Cke.

Sask.- This canker is common on P. tremuloides Michx. in many districts of Saskatchewan. It is distinctly parasitic and by girdling the tree causes the death of scattered individuals in the bluffs. About 5 per cent of the trees were dead or dying, apparently due to this canker, in a bluff near Saskatoon. (R.C. Russell).

Que.- A severe infection was reported from Blue Sea Lake.

LEAF SPOT - Septoria populicola Pk.

Ont.- A slight infection of this leaf spot was present on Populus Tacamahaca Mill. (P. balsamifera Duroi not L.) at Kemptville.

CANKER - Cytospora chrysosperma (Pers.) Fr.

Alta.- This canker was more common in southern Alberta than in 1930, although it was less common in the area north of Calgary. Little killing was observed.

Sask.- Cytospora chrysosperma was abundant on dying trees of Russian poplar in the University orchard, Saskatoon. It was hard to estimate the damage caused by the fungus, but it is thought to be a weak parasite, which followed injury due to drought.

SPRUCE (Picea)

Needle Rust - Peridermium sp.

Ont.- Blue spruce growing in the Arboretum and about city residences, Ottawa, were heavily infected with a needle rust. The trees showing rust in the Arboretum were labelled as follows: Picea Engelmannii and its variety glauca; P. pungens and varieties argentea, glauca, Kosteri, and Kosteri glauca. No rust was found on P. Engelmannii var. argentea or on many other species of Picea growing in the Arboretum. As the pycnia are deep-seated under the epidermis it is thought that the Peridermium is connected with a species of Chrysomyxa (I.L. Conners).

P.E.I.- This needle rust caused a slight infection on blue spruce in Queens county.

Dr. Meyer-Wegelin of Hannoversch-Münden, Germany, who spent the summer in the region of Matamak, Que., reported that the surface of the water in that region was covered with a very fine

dust. On examining samples of this dust, it was found to consist exclusively of aeciospores. It is probable that these spores were those of the needle rusts of spruce, which were abundant in that region. (H.T. Güssow).

Coniophora byssoidea (Pers.) Fr. was found attacking spruce seedlings in a consignment from France. The percentage of infection was slight. The fungus was determined by Dr. L.O. Overholts (Forest Herbarium and Culture 1686).

WILLOW (Salix)

SCAB - Fusicladium saliciperdum (Ell. & Tub.) Tub.

Que.- Scab was reported from Compton and Sherbrooke counties.

N.B.- Scab was common throughout the entire province.

N.S.- Scab and black canker is rapidly destroying Salix vitellina in Nova Scotia. Ten per cent of the trees surviving from previous years were killed. The damage caused by these two diseases can not be estimated separately. (K.A. Harrison)

P.E.I.- Scab is destroying many trees in each county.

BLACK CANKER - Physalospora Miyabeana Fukushi

N.B.- Black canker is common in association with scab.

N.S.- Black canker along with scab is very serious in Nova Scotia.

CANKER - Cytospora chrysosperma (Pers.) Fr.

Alta.- Cytospora chrysosperma was pentiful on dead limbs of willow in windbreaks in Alberta.

N.S.- Cytospora chrysosperma apparently kills the twigs early in the spring but it is not active in the summer. Five per cent of the twigs were damaged on Salix babylonica at Kentville.

DIE BACK - Cytospora sp.

Sask.- Considerable die-back is present in the willow windbreaks around the University orchard, Saskatoon. A species of Cytospora is fruiting on the dead limbs.

LEAF SPOT - Gloeosporium Salicis West.

Que.- Specimens of this leaf spot were collected at Berthierville.

N.S.- This leaf spot caused some defoliation, late in the season, at Kentville.

Rhytisma salicinum (Pers.) Fr. heavily infected narrow-leaved native willows at Biggar, Sask. A moderate infection was reported on willow in Rouville county, Que.

Gloeosporium boreale Ell. & Ev. was collected at Lennoxville, Que.

Uncinula Salicis (DC.) Wint. was common in northern Saskatchewan. It was also reported from Lennoxville, Que. and Queens county, P.E.I.

VI. DISEASES OF ORNAMENTALS

ARBUTUS

LEAF SPOT - Microsphaerella arbuticola (Pk.) House
B.C.- This leaf spot was general on Vancouver island and in the lower Fraser valley. The damage was severe, but it was less than in 1930. (W. Newton)

CARAGANA

LEAF SPOT - Septoria Caraganae (Jacz.) Died.
Alta.- This leaf spot caused some leaf drop at Edmonton.

Sask.- Light to heavy infections of this leaf spot were noticed on all Caragana hedges examined in Saskatoon and at the Forestry Farm, Sutherland. It caused slight premature defoliation. As usual only mature leaves were attacked.

Man.- Leaf spot caused some defoliation at Winnipeg in 1931. This is the first report of this disease from Manitoba.

CARNATION (Dianthus Caryophyllus)

RUST - Uromyces Dianthi (Pers.) Niessl
B.C.- Rust was general on Vancouver island; the damage was slight.

CHINA ASTER (Callistephus)

YELLOWS - Virus
B.C.- Yellows was rare on Vancouver island. Damage was slight. The disease was also reported from Summerland.

Alta.- Yellows was often common in gardens throughout the province. The disease was often severe.

Sask.- Yellows was severe in all parts of Saskatoon. In the City Gardens, over 50 per cent of the plants were affected. All the plants were diseased in a bed 50 x 10 ft. at the University. In the Aster section of the Flower Show, there were few entries on account of the disease. It was also prevalent at Indian Head.

Man.- Yellows was severe at the Agricultural College, in Winnipeg, and elsewhere.

A good many marigolds (Calendula) turned yellow and the heads only partly developed as in aster yellows or more commonly did not properly expand at all at the Agricultural College, in Winnipeg, and other places (G.R. Bisby).

Que.- Over 90 per cent of the plants were affected with yellows in an experimental bed at Cap Rouge. The eleven varieties present were about equally infected. Tarnished plant bug may have caused some of the injury.

A single plant of Scabiosa was found affected with yellows in the same garden at Cap Rouge.

N.B.- Yellows was widespread and destructive throughout the province.

Yellows affected a number of other garden flowers at the Experimental Station, Fredericton. The following notes on infection, damage, etc. were supplied by Mr. D.J. MacLeod: Ageratum, 50 per cent affected; Calendula, all the marigolds affected and severely damaged, flowers seriously disfigured; Cape Marigold (Dimorphotheca), 100 per cent affected, damage severe; Coreopsis, 50-100 per cent affected, damage severe, yellows common in York county; Dahlia, occasionally infected, damage slight; Everlasting (Helichrysum), all varieties affected 100 per cent, damage severe; Gaillardia, severely affected; Marigold (Tagetes) all varieties affected 100 per cent, damage severe; Treemallow (Lavatera) 10 to 30 per cent affected, damage severe; Zinnia, 25 per cent affected, damage severe.

P.E.I.- This disease is so destructive that it is practically impossible to grow garden asters.

WILT - Fusarium conglutinans Woll. var. Callistephi Beach

B.C.- Wilt was general on Vancouver island and in the lower Fraser valley. The damage was severe. It was also reported from Summerland.

Alta.- The disease was observed at Edmonton.

Sask.- A trace of wilt was noted in the beds at the University, Saskatoon. A moderate infection was also seen in a city

garden at Saskatoon.

Ont.- Wilt was again widespread and serious in western Ontario. Some aster growers reported that 100 per cent of their plants were destroyed. In the gardens inspected, 8 to 15 per cent of the plants were infected (J.E. Howitt).

Aster wilt was general in Lincoln and York counties.

Que.- In general the light coloured varieties were most affected (up to 30 per cent) by wilt in the experimental garden at Cap Rouge. Some misses occurred in the rows, but it may have been due to cut worms.

N.B.- Wilt was general throughout the province. The damage was mild to severe.

STEM and FLOWER BLIGHT - Botrytis cinerea Pers.
B.C.- This disease was general on Vancouver island and in the lower Fraser valley. The damage was slight.

STEM ROT - Corticium Solani (Prill. & Del.) Bourd. & Galz.
B.C.- Stem rot was general, but caused slight damage on Vancouver island and in the lower Fraser valley.

RUST - Coleosporium Solidaginis (Schw.) Thüm.
N.B.- China aster was moderately infected in the plots at Fredericton. The damage was slight.

CHRYSANTHEMUM

BLOSSOM BLIGHT - Botrytis cinerea Pers.
B.C.- Blossom blight was rare on Vancouver island.

POWDERY MILDEW - Oidium Chrysanthemi Rabh.
B.C.- Powdery mildew was general on Vancouver island and in the lower Fraser valley. The damage was severe.

DAHLIA

MOSAIC - Virus

P.E.I.- Traces of mosaic occurred at the Experimental Station, Charlottetown. The diseased plants were badly dwarfed, and matured early or died. This disease is evidently carried over in the tuber as sets from infected plants have consistently yielded diseased plants in the last three years.

TUBER ROT - Bacterial

N.B.- A bacterial rot affected about 5 per cent of the tubers in the plots at Fredericton.

ENGLISH IVY

LEAF SPOT - Colletotrichum trichellum (Fr.) Duke
(=Vermicularia trichella Fr.)

B.C.- This leaf spot is general on Vancouver island. The damage is slight (W. Newton).

An examination of the specimens sent by Dr. Newton showed that the fruit body is a typical acervulus on which are borne the spores and the stout setae. In the absence of a pycnidium we have followed Miss Duke in placing the fungus in the genus Colletotrichum. (I.L. Conners & A.S. Hill)

FLOWERING CURRANT (Ribes aureum)

WHITE PINE BLISTER RUST - Cronartium ribicola Fischer

Que.- A trace of rust was found at L'Assomption.

GERANIUM (Pelargonium)

LEAF SPOT - Cercospora Brunkii Ell. & Ev.

Ont.- This leaf spot was destructive to two kinds of geraniums in a greenhouse at Belleville. The identification of the fungus was confirmed by Dr. C. Chupp. This report is apparently the first Canadian record.

ROOT ROT - Pythium de Baryanum Hesse var. Pelargonii H. Braun

Man.- This disease appeared in a greenhouse at Winnipeg. A

culture of the pathogen made by Dr. Bisby was compared with an authentic culture of the above named species and no difference could be found between them. This probably is the first report for Canada (T.C. Vanterpool).

GLADIOLUS

SCAB - Bacterium marginatum McCull.

B.C.- Scab was general on Vancouver island and in the lower Fraser valley.

Alta.- Scab was found at Vermilion.

Que.- One hundred per cent of the crop was affected and severely damaged in a garden in Jacques Cartier county. The bulbs were planted on new land, but were not treated.

N.B.- Scab caused moderate damage to gladioli at the Experimental Station, Fredericton.

HARD ROT - Septoria Gladioli Pass.

B.C.- Hard rot was general on Vancouver island and in the lower Fraser valley. The damage was moderate.

N.B.- Hard rot caused moderate damage at Fredericton.

MOSAIC - Virus

B.C.- Mosaic was general, but did slight damage on Vancouver island and in the lower Fraser valley.

GOLDENGLOW (Rudbeckia)

POWDERY MILDEW - Erysiphe Cichoracearum DC.

Ont.- Powdery mildew is quite common on goldenglow at Ottawa.

HOLLYHOCK (Althaea)

RUST - Puccinia Malvacearum Bert.

B.C.- Rust was general on Vancouver island and in the lower Fraser valley. The damage was slight. The disease was also abundant at Summerland.

Ont.- Rust was severe in a garden at Rodney.

Que.- Rust was abundant about Montreal. The damage was probably slight. It was quite common on the lower leaves at Lennoxville, Abbotsford, and Ste. Anne de la Pocatière.

N.B.- Rust was general on hollyhocks throughout the province, causing serious damage to the plants.

P.E.I.- Rust infections varied from a trace to very heavy, causing slight to severe damage in Prince and Queens counties. Bordeaux liquid spray reduced the amount of infection. Lime sulphur spray and sulphur dust caused early defoliation.

ROOT ROT - Plenodomas Meliloti Dearn. & Sanford

Alta.- Two cases of root rot were reported at Edmonton.

Sask.- Specimens affected with Plenodomas were collected by A.R. Brown at Regina. The plants may have been winter killed, but Plenodomas was probably responsible in part for their death. (P.M. Simmonds)

LEAF SPOTS

Ascochyta parasitica Fautr. was found fruiting on small gray spots on the upper side of the leaves at Abbotsford and Lennoxville, Que. The infection was heavy in the latter collection. A few spots on a few leaves collected at Abbotsford were caused by Ascochyta althaeina Sacc. & Bizz.

WILT - Sclerotinia sp.

N.B.- Seventy-five per cent of plants were affected by wilt. The damage was slight.

HONEYSUCKLE (Lonicera)

LEAF BLIGHT - Glomerularia Corni Pk.

Ont.- Leaf blight caused a slight infection on escaped bushes of Lonicera tatarica at Ottawa. The identification of the fungus was confirmed by Dr. G.R. Bisby.

Que.- Leaf blight was found at Lennoxville and Ste. Anne de la Pocatière.

POWDERY MILDEW - Microsphaera Alni (Wallr.) Salm. var. Lonicerae (Schlecht.) Salm.

Alta.- Powdery mildew was reported from Kinuso.

Sask.- A fairly heavy infection was present on a few bushes near the Laboratory of Plant Pathology, at Saskatoon.

Que.- Powdery mildew affected all the honeysuckle shrubs at the Experimental Station, Ste. Anne de la Pocatière.

HYDRANGEA

POWDERY MILDEW - Oidium sp.

Sask.- One house plant brought to the Laboratory at Saskatoon on June 4, was being defoliated by powdery mildew. The conidial stage of one of the Erysiphaceae was present in abundance.

IRIS

LEAF SPOT - Didymellina macrospora Kleb. (Heterosporium gracile Sacc.).

B.C.- Leaf spot was general and caused severe damage on Vancouver island.

Sask.- A light infection of leaf spot was present on Sept. 10, on some of the plants in the University garden, Saskatoon. By Sept. 30 infection varied from light to heavy on 25 per cent of the leaves. The mild weather in the interval favoured the spread of the disease.

Que.- Infections of leaf spot varying from a trace to slight were observed at L'Assomption, Lennoxville, Abbotsford, Beebe, and Ste. Anne de la Pocatière.

N.B.- Leaf spot was noted in garden plantings in York county, causing slight to severe damage.

N.S.- Leaf spot caused the death of 20 per cent of the leaves in a small garden in Annapolis county.

P.E.I.- Heavy infection of leaf spot caused severe damage to the leaves in many gardens in Queens county.

RHIZOME ROT - Bacillus carotovorus L.R. Jones
Sask.- A slight amount of rhizome rot was present in the University plots, Saskatoon.

N.B.- Rhizome rot is common and widespread in the province.

CROWN ROT - Sclerotium Delphinii Welch
N.B.- A severe infection of crown rot was found in a garden plot at Sackville.

BULB ROT - Bacillus carotovorus L.R. Jones
B.C.- A bulb rot attributed to Bacillus carotovorus was general on Vancouver island. The damage was considerable. A species of Penicillium was also found associated with bulb rot.

MOSAIC - Virus
Ont.- Mosaic affected quite a number of the plants of Iris tingitana in greenhouses at Toronto and Brampton. The bulbs, from which these plants were grown, were imported from France.

JAPANESE BARBERRY (Berberis Thunbergii)

BACTERIAL LEAF SPOT - Phytomonas Berberidis Thornbery & Anderson
Ont.- This disease has been observed on the Japanese barberry in the Arboretum at Ottawa for the past ten years. (H.T. Gussow).

LARKSPUR (Delphinium)

BACTERIAL BLIGHT - Pseudomonas Delphini (E.F.Sm.) Stapp
B.C.- Diseased leaves sent in for examination from Vancouver were found affected with bacterial blight (G.E. Woolliams).

N.B.- Bacterial blight is common throughout the province. The disease is severe in some gardens.

WILT - Fusarium sp.
B.C.- One per cent of the plants were affected with wilt in a garden at Kelowna.

STEM ROT - Ascochyta sp.
Alta.- Stem rot apparently due to an Ascochyta caused severe injury in a garden at Edmonton.

LILAC

POWDERY MILDEW - Microsphaera Alni (Wallr.) Salm.
Powdery mildew was fairly abundant on lilac at Ottawa, Ont.; Beebe and Ste. Anne de la Pocatière, Que.; and Charlottetown, P.E.I.

LEAF SPOT - Phyllosticta Syringae West.
Que.- About 5 per cent of the leaves were affected with leaf spot at Beebe. On some leaves one or two small spots occurred, on others the spots were large.

LILY

FLOWER BLIGHT - Botrytis sp.
B.C.- Flower blight was general on Vancouver island. The damage was severe.

LUPINE (Lupinus)

RUST - Uromyces Lupini Berk. & Cke.
B.C.- Rust is common on both cultivated and wild species of lupine in the Victoria district, V.I.

POWDERY MILDEW - Erysiphe Polygoni DC.
B.C.- Powdery mildew is present on lupine on Vancouver island.

NARCISSUS

SMOULDER - Botrytis narcissicola Kleb.
B.C.- Smoulder was general, but the damage was slight on Vancouver island.

MOSAIC - Virus
B.C.- Mosaic was general on Vancouver island, but the damage was slight.

GREY DISEASE - Virus

B.C.- Grey disease characterized by a light-green or grey mottling of the leaves, was general on Vancouver Island, causing slight damage.

EELWORM - Tylenchus dipsaci (Kühn) Bastian

B.C.- Eelworm was present on Vancouver island, but the damage was slight.

A number of diseased bulbs were received at the Saanichton Laboratory for examination. These bulbs had been graded out from a five acre field near Sidney. Besides bulb flies and bulb mites, two different eelworms were identified. One was Tylenchus dipsaci; the other belonged to the genus Diplogaster. Specimens of the latter were sent to Dr. Steiner, Senior Nematologist, U.S.D.A., Washington, D.C. He kindly identified it as Diplogaster longicaudatus Bütschli. He stated that it is not considered to be the primary agent, but as a secondary agent it plays an important role in the final breakdown of the infected plants. This appears to be the first time that this nematode has been reported in Canada (R.J. Hastings).

PANSY (Viola tricolor)

POWDERY MILDEW - Sphaerotheca Humuli (DC.) Burr. var. fuliginea (Schlecht.) Salm.

B.C.- Powdery mildew was quite severe in a garden near Summerland.

PEONY (PAEONIA)

BLIGHT - Botrytis Paeoniae Oud.

N.B.- Blight is widespread, but the damage is slight.

N.S.- Blight was reported from several parts of the province. One nurseryman reported control of early infections by watering with Semesan solution in the spring.

LEAF BLOTCH - Cladosporium Paeoniae Pass.

Que.- A trace of leaf blotch was collected at L'Assomption.

PETUNIA

MOSAIC - Virus

Sask.- About 5 per cent of the plants were affected with mosaic in a bed, 10 x 50 feet. The affected plants were "bunchy", slightly dwarfed with pale yellow, ruffled leaves. The flowers were smaller than normal, mottled pink and white instead of being a deep solid pink.

WILT - Sclerotinia Sclerotiorum (Lib.) de Bary

Alta.- Wilt caused slight damage to petunias in an Edmonton garden.

PHLOX

LEAF SPOT - Septoria divaricata Ell. & Ev.

Que.- About a dozen plants were found heavily infected in a garden at Beebe.

POWDERY MILDEW - Erysiphe Cichoracearum DC.

Ont.- Powdery mildew was found in a garden in Lincoln county.

ROSE (Rosa)

RUST - Phragmidium spp.

B.C.- Rust was general on roses on Vancouver island; the damage was slight. Specimens collected at Saanichton were infected with Phr. disciflorum (Tode) J.F. James.

Que.- A fairly heavy infection of rust caused by Phr. americanum Diet. was present on 50 per cent of the leaves at Abbotsford. Rust due to Phr. disciflorum was quite common at Beebe and Ste. Anne de la Pocatière.

N.B.- Rust on rose is widespread in York county.

P.E.I.- Rust infection was noted on the varieties grown at the Experimental Station, Fredericton, as follows; heavy, Star of Waltham, Duke of Edinburgh, General Jacqueminot, A.E. Williams, Margaret Dickson, Frau Karl Druschki, Louise Crette, Alfred Colomb, Baron de Rothschild, and Lady Astor; trace, Captain Hayward; none, Crimson Rambler and Edith Cavell. Where the rust was heavy, the older leaves were destroyed. (R.R. Hurst)

BLACK SPOT - Diplocarpon Rosae Wolf
(Actinonema Rosae (Lib.) Fr.)

Sask.- Black spot was present as follows in the University garden, Saskatoon: Persian Yellow, heavy, causing defoliation of the lower leaves; Austrian Yellow, heavy, causing some defoliation; Le Rêve, heavy; Conrad F. Meyers, heavy on lower leaves; Rubrifolia, moderate; Rubrosa, light; Harison's Yellow, growing close to Persian Yellow, no infection.

Ont.- Black spot was prevalent causing defoliation on several varieties in Lincoln county.

N.B.- Black spot was common and widespread in the province. The damage was slight.

P.E.I.- This disease was quite common this season; severe damage in many instances.

POWDERY MILDEW - Sphaerotheca pannosa (Wallr.) Lév.

B.C.- Powdery mildew was prevalent and caused severe damage on Vancouver island. Some mildew was present on practically all varieties and severe on a few at Penticton and Summerland. The disease was more prevalent than usual.

Ont.- Powdery mildew was prevalent and severe over much of the Niagara peninsula. It was rather severe on most varieties in many private gardens at St. Catharines. Control measures were ineffective due to the extremely humid weather.

P.E.I.- Edith Cavell and Margaret Dickson were slight to moderately infected. The disease is seldom serious.

CANE BLIGHT - Leptosphaera Coniothyrium (Fuck.) Sacc.
(Coniothyrium Fuckelii Sacc.)

Ont.- This disease was severe in 1930 on two climbing roses in Lincoln county, destroying more than two thirds of each bush. Other varieties in the immediate vicinity did not seem to be affected.

SALPIGLOSSIS

MOSAIC - Virus

B.C.- What appeared to be mosaic affected several plants in a plot at Summerland.

SNAPDRAGON (Antirrhinum)

RUST - Puccinia Antirrhini Diet. & Holw.

B.C.- Rust was general and severe on Vancouver island. It was also severe in some plots at Kelowna.

Ont.- Rust was very prevalent in all parts of Western Ontario. In many cases hundreds of plants were severely damaged.

YELLOWS - Virus

N.B.- What appears to be yellows is common at the Experimental Station, Fredericton.

WILT - Verticillium spp.

Ont.- Wilt was general and caused the death of many plants in Lincoln and York counties.

STEM ROT - Sclerotinia Sclerotiorum (Lib.) de Bary

Alta.- Stem rot was found in a garden at Edmonton. The damage was slight.

SWEET PEA (Lathyrus)

POWDERY MILDEW - Microsphaera diffusa Cke. & Pk.

Que.- Powdery mildew was quite prevalent at Cap Rouge. A small amount was also present at L'Assomption.

ROOT ROT

Sask.- Sweet peas were severely affected with a root rot as they were coming into flower in the City Gardens, Saskatoon. The peas were sown in a trench in well manured, limed soil and kept well watered. Isolations suggested that the disease was of bacterial nature.

P.E.I.- A root rot, the cause of which was undetermined, was reported several times from each county. Infection varied from 5 to 100 per cent; the damage was often severe.

WHITE MOULD - Erostrotheca multiformis Martin & Charles (Cladosporium album Dows.)

B.C.- On July 5 at Duncan, in the Cowichan district, Vancouver island, a leaf mould was discovered on sweet pea. The

disease was general on plants being grown for exhibition purposes under the Cordon system. It was also severe among the unpruned plants growing in a hollow along a creek, a location, where the temperature and humidity were high. Although the losses were considerable among the exhibition plants and in the general crop in the hollow by the creek, they were insignificant in the rest of the ten-acre block. The general crop was grown staked on brush under ordinary field conditions.

From a study of the symptoms and the associated fungus, it was evident that the disease was identical to the white mould of sweet pea described in England in 1924 by Dowson (1). He named the pathogen, Cladosporium album Dows. In 1928 Martin & Charles (2) described the perfect stage as Erostrotheca multiformis and reported the disease in Massachusetts, New York, and Pennsylvania. As far as it is known, this is the first record of this disease in Canada (R.J. Hastings).

TULIP

BLIGHT - Botrytis Tulipae (Lib.) Lind

P.E.I.- Blight varied from a trace to heavy on late flowering tulips in Queens county; the damage was slight to severe. This disease causes severe damage each year to tulips.

BLUE VERVAIN (Verbena hastata)

LEAF SPOT - Septoria Verbenae Rob. & Desm.

Que.- A dozen plants were severely affected with leaf spot at Beebe. The causal organism agreed with S. Verbenae as described by Saccardo (Syll. 3:537) on V. officinalis except that the spores measured 18-30 x 1.5u instead of 40-45 x 1-1.5u.

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(1) Dowson, W.J. A new disease of sweet peas. Jour. Roy. Hort. Soc. 49:211-221. 1924.

(2) Martin, G.H. & Charles, Vera K. Preliminary studies of the life history of Erostrotheca multiflormis, the perfect stage of Cladosporium album Dowson. Phytopath. 18:839-846. 1928.

VIRGINIA CREEPER (Parthenocissus quinquefolia)

POWDERY MILDEW - Uncinula necator (Schw.) Burr.
Ont.- Powdery mildew was common at Ottawa.

WISTERIA

LEAF SPOT - Phyllosticta Wistariae Sacc.
Que.- About 10 per cent of the leaves were moderately infected at Beebe.

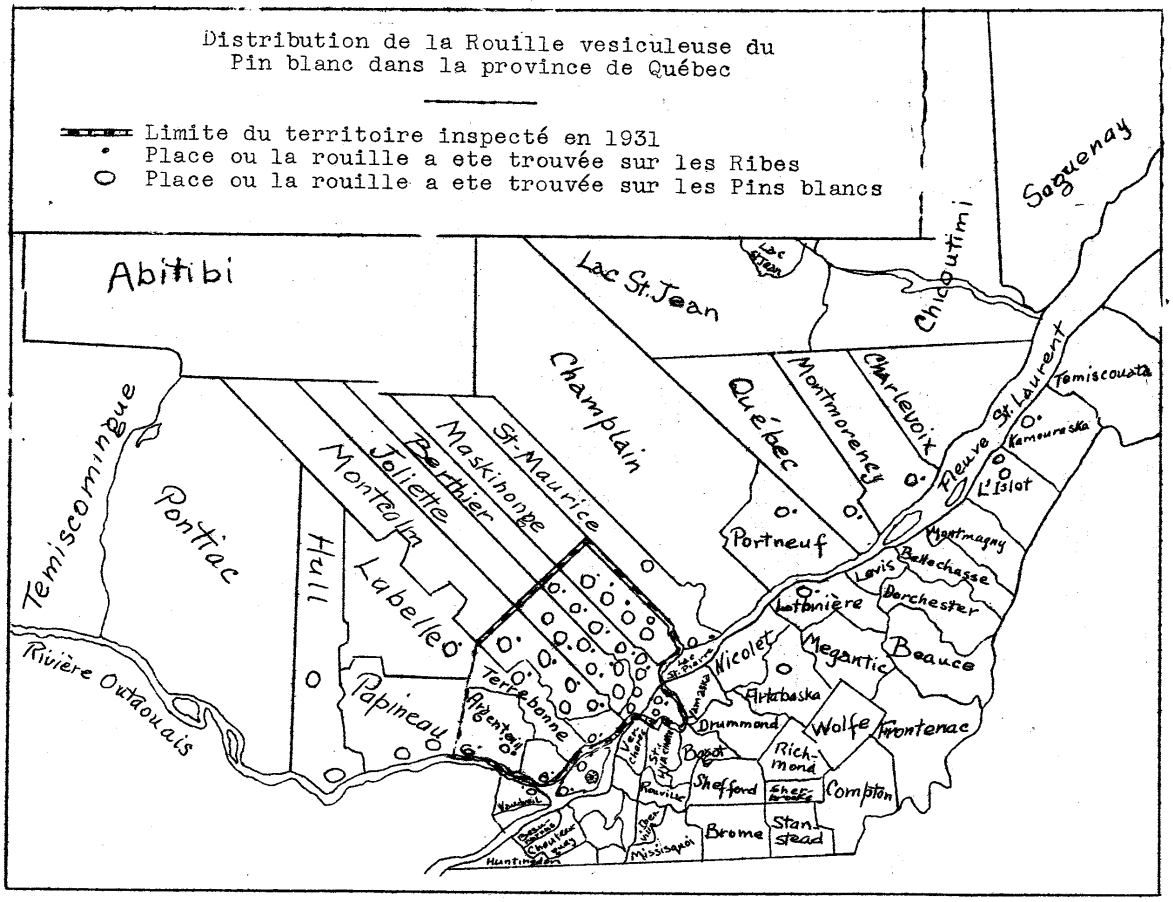
YUCCA

LEAF SPOT - Coniothyrium sp.
N.S. - About 20 per cent of the leaves were affected in a group of plants on the Experimental Station grounds, Kentville. The damage was slight.

ZINNIA

POWDERY MILDEW - Erysiphe Cichoracearum DC.
Ont.- Powdery mildew was general on Zinnia in Lincoln county.

WILT - Fusarium sp.
B.C.- Wilt was present in an experimental plot at Summerland.


Distribution de la Rouille vesiculeuse du
Pin blanc dans la province de Québec
Limite du territoire inspecté en 1931
Place ou la rouille a ete trouvée sur les Ribes
Place ou la rouille a ete trouvée sur les Pins blancs
Abitibi
Lac St. Jean
Chicoutimi
Saguenay
Témiscamingue
Pontiac
Hull
Labelle
Papineau
Rivière Outaouais
Montcalm
Joliette
Berthier
Maskinonge
St-Maurice
Champlain
Québec
Portneuf
Montmorency
Charlevoix
Fleuve St. Laurent
Témiscouata
Kamouraska
L'Islot
Matapédia
Matapédia
Bellechasse
Lévis
Dorchester
Lotbinière
Nicolet
Mégantic
Beauce
Arthabaska
Drummond
Wolfe
Frontenac
Richmond
Bagot
Shefford
Compton
Stanstead
Brome
Terrebonne
Argenteuil
Huntingdon

Distribution de la Rouille vésiculeuse du Pin blanc dans la province de Québec.

René Pomerleau.

Les premiers signalements de la présence de la Rouille vésiculeuse du Pin blanc causée par le Cronartium ribicola F. de Wald, dans la province de Québec, furent faits vers 1916; mais on n'avait constaté la rouille que sur les feuilles de Ribes. En 1918 elle était trouvée sur les pins dans le comté de Portneuf. Depuis on n'a pas cessé de la signaler un peu partout.

La carte adjointe indique les comtés et les localités où la rouille a été observée jusqu'à date. Il n'y a pas de doute qu'elle est beaucoup plus répandue qu'il est indiqué mais il n'y a pas à connaissance de l'auteur d'autres mentions officielles.

Au cours de cette année (1931), le Département des Terres et Forêts de cette province a organisé une patrouille pour déterminer l'étendue des dégâts causés par cette maladie et aussi pour localiser dans un certain rayon les peuplements de Pins blancs, afin de pouvoir organiser le travail d'éradication au cours des années à venir.

Nous avons parcouru pendant la belle saison toute l'étendue des comtés de Maskinongé, Berthier, Joliette, Montcalm, L'Assomption, Terrebonne, Deux-Montagnes, Argenteuil et Richelieu, mais en nous limitant aux propriétés privées sans toucher aux limites affermées de la couronne.

Il a été localisé, inspecté et situé sur des cartes 107,604 acres de forêt contenant de 25 à 100% de Pin blanc, ce qui donne 619,667,900. P.M.P. L'âge des pins varie de 35 à 100 ans avec une moyenne approximative de 40 ans.

Dans la presque totalité des peuplements la Rouille vésiculeuse a été trouvée et dans certains peuplements près de 20% des arbres portaient un ou plusieurs chancres, mais en moyenne nous trouvons de 1 à 7% d'infection.

L'âge des chancres varie de 3 à 7 ans, c'est-à-dire que les plus vieilles infections remontent à 1924-25, mais la plupart datent de 1926-27. Encore très peu de pins sont morts par la rouille vésiculeuse, mais beaucoup portent des attaques mortelles. Nous avons fréquemment trouvé des arbres qui portaient des chancres suffisamment développés pour entraîner la mort de la tête et quelquefois même des têtes sont tombées parce que le tronc a cassé à l'endroit du chancre.

En général les infections ne sont pas très vieilles dans cette partie de la province, c'est pourquoi nous n'avons pas encore de dégâts très apparents dans les peuplements naturels de Pins blancs.

Les Ribes sont en assez grande abondance dans cette partie de la Province. Tous les terrains boisés contiennent un assez grand nombre de Ribes, nombres qui peut être évalué de 5 à 15 à l'acre.

L'espèce de Ribes la plus répandue est sans contredit le R. glandulosum, sur laquelle la rouille est presque toujours trouvée. Vient ensuite le R. Cynosbati qui est presque aussi généralement trouvé et sur lequel la rouille est aussi généralement présente. Le R. triste var. albinervum est aussi très fréquent et presque toujours infecté par la rouille. Le R. lacustre est un peu moins abondant mais semble aussi susceptible que les précédents à la rouille. Le R. americana, qui occupe une place prépondérante le long des rivières et les cours d'eau, surtout dans les localités qui sont situées le long du fleuve St-Laurent, porte, presque aussi fréquemment que les précédents, des taches de rouille. Cette dernière espèce est aussi cultivée quelquefois comme arbuste fruitier. Les autres Ribes comme R. hirtella et R. oxyacnathoides sont très peu répandus dans ces régions.

Le Ribes nigrum, qui est presque généralement cultivé chez les cultivateurs et les petits propriétaires de cette province, est une cause importante de la distribution de la rouille; car il est toujours trouvé avec des feuilles couvertes de spores pendant le mois d'août. Les R. Grossularia et vulgare sont peut-être plus fréquemment cultivés que le précédent, mais ils semblent moins susceptibles à l'attaque de la rouille; surtout le dernier. C'est ainsi que l'on trouve des jardins où le R. nigrum est très fortement infecté tandis qu'il est difficile de trouver de petites infections sur le R. Grossularia et beaucoup moins sur le R. vulgare.

A part ces comtés d'autres parties ont été visitées comme les plantations, les pépinières et quelques forêts des limites affermées de la couronne.

Dans les plantations de pins les dégâts dus à cette maladie sont plus graves. Ainsi dans la plantation de la Canadian International Paper Co. située au Lac Caché dans le comté de Terrebonne, plus de 50% des pins plantés sont sévèrement attaqués et tous les autres sont voués à une mort prochaine à cause de l'abondance incroyable des Ribes dans cette plantation. Les Ribes ont pris ce développement extraordinaire sans doute après

le passage de l'incendie qui est une perturbation suffisante pour causer ce développement.

Nous avions commencé un travail d'éradication dans cette plantation mais nous nous sommes bientôt aperçus que ce n'était pas pratique car nous trouvions de 600 à 800 buissons de Ribes à l'acre. Le coût de l'extraction naurait été très élevé sur ce terrain à cause des difficultés topographiques et du nombre trop élevé des Ribes.

Pour compléter nos renseignements sur la distribution de la rouille, nous avons inspecté, sur une petite échelle cependant, les peuplements naturels de quelques limites. A la Montagne Tremblante, comté de Terrebonne, un peuplement de pins de 250 acres, contenant environ 20% de Pins blancs a été inspecté. Nous avons trouvé près de 45% des jeunes pins de moins de 10 ans qui portaient des infections et beaucoup d'adultes qui étaient attaqués. Par contre dans les limites situées à quelque distance de la Gatineau (Rivière-à-l'Aigle) l'inspection ne nous a pas révélé la présence de la Rouille sur les Pins blancs ni sur les Ribes.

D'autres tentatives d'éradication ont aussi été faites cette année dans la Province. A St-Jovite, comté de Terrebonne, une plantation de la compagnie Canadienne Internationale a été protégée de la Rouille qui menaçait de la détruire. Mais le travail le plus important d'éradication des Ribes a été conduit à la pépinière de Berthierville où la Rouille vésiculeuse existait et était un danger grave pour la cause du reboisement.

La pépinière et les plantations de Berthierville occupent une superficie de 1,111.29 acres; pour protéger cet espace nous avons établi un rayon de 1500 pieds exempt de Ribes et formant un total de 3877.94 acres. La partie boisée de cette zone a été parcourue par une équipe de 20 hommes dispersés sur une distance de 180 pieds de telle sorte que chaque homme pouvait surveiller et arracher les Ribes sur une largeur de 10 pieds.

Un total de 8860 buissons de Ribes ont été ainsi enlevés; ce qui donne une moyenne de 2.28 buissons à l'acre. Le coût de l'éradication, en tenant compte que ce travail a été fait d'une façon systématique et que des plans, où tous les buissons de Ribes sont situés, ont été faits pour faciliter la rééradication, ne fut que de $0.462 de l'acre.

En résumé, la Rouille vésiculeuse du Pin blanc existe dans presque toutes les régions habitées le long du St-Laurent et de la rivière Outaouais à un pourcentage de 1 à 3% et la plupart des vieux chancres remontent à 1926-27.

Additions to

the Fungous Flora of Manitoba

G. R. Bisby, A. H. R. Buller, and John Dearness

The following fungi have been recorded in Manitoba since the publication of "The Fungi of Manitoba" in 1929. They are arranged in the order used in the book and the page, on which the new record may be added, is indicated at the left. (Ingolf records are from the Ontario boundary.) Names marked "(n)" are near the species listed; these, and certain others, require further checking. Members of the Dominion Rust Research Laboratory have contributed some of the additions, and Dr. Jakob E. Lange of Denmark examined in the field, and supplied the names for, many of the Agaricaceae mentioned.

The 142 net additions listed here bring the known fungi of Manitoba (Nov. 1, 1931) to 2,109 species, plus about 20 on man and higher animals.

Note - Where a specimen has been deposited in the Division of Botany Herbarium the herbarium number is given in curves at the end of the record - I. L. Conners

Page	Add
51	Badhamia magna Pk. On poplar, M.A.C.
54	Bacillus Lathyri Manns & Taub. On sweet pea, Winnipeg.
55	Saprolegnia Thuretii de Bary. On flies in water, M.A.C.
57	Zygorhynchus Vuilleminii Namysl. From soil from Killarney.
59	Ascobolus (n) glaber Pers. On horse dung, M.A.C.
	A. viridulans Phill. & Plowr. On rabbit dung, M.A.C.
	Ascophanus gallinaceus (Pk.) Seaver. On partridge dung, M.A.C.
	A. glaucellus Rehm. On rabbit dung, M.A.C.
61	Sepultaria (n) aurantia Clem. In soil, Morris. (1180)
	Arachnopeziza aurelia (Pers.) Fckl. On birch, Victoria Beach. (1185)
62	Ciboria luteovirescens (Rob.) Sacc. On twigs, M.A.C.

Page Add

62 Dasyscyha (n) Willkommii (Hartig. On Pinus Banksiana, Victoria Beach.

64 Schizoxylon decipiens Karst. var. Symphoricarpi Rehm, M.A.C.

66 Eurotium pulcherrimum Wint. On dung of grouse and goose, M.A.C.

67 Claviceps microcephala (Wallr.) Tul. On Phleum pratense and Panicularia grandis, Chater and Clandeboye. Reported in the book as C. purpurea, of which C. microcephala may be a form.

69 Stigmatea Juniperi (Desm.) Wint. (MICROTHYRIALES), Victoria Beach. (1181)

70 Pleurage (n) anomala D. Griff. On partridge dung, M.A.C.

71 Wallrothiella Arceuthobii (Pk.) Sacc. On Arceuthobium americanum on Pinus Banksiana, Victoria Beach (S. Dowding) (962). (cf. Dowding, E. Silver, Wallrothiella Arceuthobii, a parasite of the Jack-pine mistletoe. Can. Jour. Res. 5:219-230. pl. 1-2, text fig. 1-21 and map. 1931. - The author also reports the finding of Wallrothiella Arceuthobii on jack-pine mistletoe north of Edmonton, Alta. Between the N. Saskatchewan and the Athabasca Rivers).

Otthia Symphoricarpi Ell. & Ev. On Symphoricarpos, M.A.C.

Amphisphaeria decolorans (Rehm) Br. On " " " "

A. incrustans E. & E. On Abies balsamea, Victoria Beach.

72 Lophidium compressum (Pers.) Sacc. On Populus, M.A.C.

Lophiostoma (n) praemorsum (Lasch.) Fckl. On Symphoricarpos, M.A.C.

Didymella applanata (Niessl) Sacc. Substitute for Mycosphaerella rubina.

75 Ophiobolus (n) filisporus (C. & E.) Sacc. On Grindelia, Ste. Agathe.

O. trichisporus E. & E. (probably). On straw, M.A.C.

Page Add

75 Pyrenophora Bromi (Died.) Drechsler. On Bromus inermis, M.A.C.

76 Anthostoma melanotes (B. & Br.) Sacc. var. Symphoricarpi Brenckle. M.A.C.

Diaporthe eres Nits. Also on Symphoricarpos, M.A.C.

78 Diatrype (n) bullata (Hoff.) Fr. On Populus, M.A.C.

80 Laboulbenia flagellata Peyr. On Elaphrus sp., Beulah.

81 Doassansia Martianoffiana (Thüm.) Schroet. On Potamogeton, Norway House. (1177)

82 Chrysomyxa Arctostophyli Dietel on bear-berry, Victoria Beach. (1178)

Cronartium Quercus (Brondeau) Schroet. (C. Quercuum Miyabe). Recorded by Fraser and Conners (Trans. Roy. Soc. Canada., 19, p. 281) on Pinus sp., Morden.

83 Puccinia Anemones-virginianae Schw. On Anemone canadensis, M.A.C. (977)

84 P. Calthae (Grev.) Lk. On Caltha palustris, Victoria Beach. (923)

P. conglomerata Schm. & Kunze. On Petasites, Cowan.

P. Drabae Rud. On Draba ?daurica, Ft. Churchill (Fide I. Jorstad, Norway).

87 Rostrupia tomipara is a segregate of Puccinia Clematidis.

Uromyces Medicaginis Pass. Trace on alfalfa, M.A.C.

89 Corticium effuscatum Cke. & Ellis. Incorrectly spelled C. effuscum.

Craterellus lutescens Pers. ex Fr. Among moss, Norway House.

Cyphella muscigena Pers. ex Fr. On moss, Vivian.

90 Peniophora affinis Burt on Poplar, M.A.C.

Page Add

91 Peniophora (n) laevis (Fr.) Burt. On Ulmus, M.A.C.

Thelephora laciniata (Pers.). Omit, as it is a synonym of T. terrestris (Ehr.) Fr.

92 Pistillaria micans (Pers.) Fr. On old herbaceous stems, M.A.C. (967)

97 Poria rhodella Fr. Swan River.

Boletus albellus Pk. Victoria Beach.

B. (n) castaneus Bull. Victoria Beach.

B. (n) chrysenteron (Bull.) Fr. Victoria Beach.

B. felleus Bull. Victoria Beach.

99 Clitocybe clavipes Fr. Ingolf.

C. Trogii Fr. Ingolf.

Collybia albiflavida (Pk.) Kauffman. Victoria Beach.

101 Hygrophorus pustulatus (Pers.) Fr. Ingolf.

H. ?subrufescens Pk. Victoria Beach.

H. tephroleucus Pers. Ingolf.

102 Lactarius chrysorheus Fr. Victoria Beach.

Lactarius hysginus Fr. Victoria Beach.

L. obnubilis Lasch. Ingolf.

L. thiogalus Fr. Ingolf.

103 Lentinus (n) badius Bres. Ingolf.

L. umbilicatus Pk. Kenora.

L. (n) Underwoodii Pk. Lac du Bonnet

Lepiota amianthina (Scop.) Fr. Ingolf.

L. (n) asperula Atk. Victoria Beach.

Page Add

103 L. illinita Fr. Ingolf.

Marasmius scorodonius Fr. Ingolf.

M. semihirtipes Pk. M.A.C.

Mycena corticola Fr. M.A.C.

M. epipterygia Fr. Ingolf.

104 M. (n) lactea (Pers.) Fr. Ingolf.

Omphalia campanella Fr. var. badipus Fr. Ingolf.

O. fibuloides Pk. Vivian.

O. pyxidata Bull. Vivian.

Pleurotus lignatilis Fr. Ingolf.

105 P. serotinus Fr. Ingolf.

Russula palustris Pk. Norway House.

106 T. spermaticum Fr., var. Substitute for T. (n) subacutum Pk.

Tricholoma vaccinum Fr. Ingolf.

107 Leptonia (n) lampropoda Fr. Victoria Beach.

108 Pluteus caloceps Atk. Victoria Beach.

P. roseocandidus Atk. Victoria Beach.

109 Cortinarius brunneus Fr. Ingolf.

C. cinnamomeus Fr. var. croceus (Schaeff.) Fr. Ingolf.

C. croceoconus Fr. Ingolf.

C. glandicolor Fr. Ingolf.

C. (n) multiformis Fr. Victoria Beach.

C. pluvius Fr. Ingolf.

C. purpurascens Fr. Ingolf.

Page	Add
110	Flammula alnicola Fr. Ingolf.
	F. penetrans Fr. Ingolf.
	Galera hypnorum Fr. var. sphagnorum (Pers.) Fr. Ingolf.
	G. ravida Fr. M.A.C.
111	Hebeloma gregarium Pk. M.A.C.
	H. (n) hiemale Bres. M.A.C.
	H. (n) pascuense Pk. Victoria Beach.
	Inocybe (n) atripes Atk. Victoria Beach.
	I. geophylla Fr. var. lateritia (Weinm.) Stev. Ingolf.
112	Naucoria Myosotis Fr. On sphagnum, Ingolf.
	N. vervacti Fr. Victoria Beach.
	Paxillus (n) leptopus Fr. Victoria Beach.
	Pholiota aurivella (Batsch) Fr. Ingolf.
113	Hypholoma Artemisiae Pass. On sawdust, M.A.C.
	H. Polytrichi Fr. In a muskeg, Ingolf.
	H. populinum Britz., variety. Victoria Beach.
115	Stropharia psathyroides Lange. In moss, Ingolf.
121	Lycoperdon echinatum Pers. Ingolf.
122	Acrostalagmus cinnabarinus Cda. On potato tuber, M.A.C.
	Arthrobotrys superba Cda. On dung and nemas, University and M.A.C.
	Aspergillus terreus Thom. From butter, isol. at M.A.C.
124	Cercospora (n) simulans Ell. & Kell. On Amphicarpa monoica, M.A.C.
126	Coremium cinereoalbum (Bon.) Sacc. On rabbit dung from Kenora.

Page Add

126 Cylindrium aeruginosum (Lk.) Lindau. On fallen oak leaves, M.A.C. (1117)

Fusarium (n) aquaeductum (Rad. & Rab.) Sacc. In slime flux, Victoria Beach.

127 Gliocladium macropodium March. On goose dung from Rosser.

Helminthosporium Bromi Died. Stage of Pyrenophora Bromi, M.A.C. (1175)

H. Urticae Pk. On old stems of Urtica, M.A.C.

128 Hormiactis (n) alba Preuss. On poplar bark, M.A.C.

Macrosporium Saponariae Pk. On Vaccaria Vaccaria, M.A.C. (1176)

Monilia (n) candida Bonord. On goose dung from Rosser.

M. sitophila (Mont.) Sacc. As a laboratory mould, M.A.C.

Oospora lactis (Fres.) Lindau. In milk etc., everywhere.

129 Polyscytalum sericeum Sacc. On old leaves, M.A.C.

130 Ramularia (n) variata Davis. On Mentha canadensis, M.A.C.

Sclerotium bifrons Ell. & Ev. On leaves of Populus tremuloides, Victoria Beach and Bull Head, Lake Winnipeg, (938).

S. lichenicola Svend. On Cladonia, Victoria Beach.

131 Sepedonium niveum Massee & Salm. On rabbit dung, M.A.C.

Sporotrichum parasiticum Pk. On black knot on Prunus, Victoria Beach. (1174)

Stachybotrys cylindrospora Jensen. In cultures, Rust Lab.

S. lobulata Berk. On paper in a dung culture, M.A.C.

Stysanus fimetarius (Karst.) Massee & Salm. On horse dung, M.A.C.

S. (n) microsporus Sacc. In cultures, Rust Lab.

Page Add

131 Trichoderma Koeningi Oud. In cultures, Rust Lab.

135 Steganosporium Fautreyi Sacc. & Syd. On birch twigs, Victoria Beach.

Camarosporium Caraganae Karst. On old Caragana, M.A.C. (933)

136 C. (n) Negundinis Ell. & Ev. On ZAcer Negundo twigs, M.A.C.

Coniothyrium (n) parasitans (Berk & Rav.) Tassi. On Hypoxylon, M.A.C. (1191)

Cytospora leucostoma Sacc. On cult. plum, Morden.

C. Symphoricarpi Ell. & Barth. Stage of Valsa, M.A.C.

137 Dothichiza Symphoricarpi Petrak. On S. occidentalis, M.A.C.

Haplosporella Symphoricarpi Pk. (a variety) M.A.C.

138 Phyllosticta Bonanseana Sacc. On alfalfa, M.A.C.

P. fatiscens Pk. On Nymphaea advena, Jack-fish Rapids near Norway House. Spores 7-10 x 2.5-3.8u. (1190)

139 P. hibiscina Ell. & Ev. On Hibiscus esculentus L., Morden. Spores 4-8 x 2u. (1186)

141 Septoria Caraganae (Jacz.) Died. On Caragana leaves, M.A.C. (1188)

S. flagellaris Ell. & Ev. On Convolvulus sepium, M.A.C. Spores 50-86 x 2-3u. (1187)

Corrections to the Host Indices as Published

Host Index

156 Diatrypella verrucaeformis on Corylus spp. C. Change to D. missouriensis E. & E. cf. p. 79

157 Lachnella sporotricha on Helianthus annuus equals Dasyscypha sporotricha (Oud.) Rehm cf. p. 62.

Peniophora affinis on Populus spp. D cf. "p. 90" of Additions.

Host Index

Page

158 Arcyria nutans on Populus spp. E. Omit.

Physarum connatum " " " should be P. notabile Macbr. cf. p. 53

Hydnum populinum on Populus spp. E. Omit; too uncertain.

Poria vulgaris on Populus spp. E. should be P. selecta Karst. cf. p. 97.

159 Sphaeropsis Mali on Prunus (Padus) nana C. is probably the same as Sphaeropsis Malorum Pk. cf. p. 159.

Dasyscypha cerina on Quercus macrocarpa C. Omit; too uncertain.

160 Rhabdospora Symphoricarpi on Symphoricarpos occidentalis C. a nomen nudum.

164 Phyllosticta sp. on Hibiscus esculentus L. is P. hibiscina Ell. & Ev. cf. "p.139" of Additions.

165 Sclerotinia cinerea on Prunus nigra Ait. should be S. americana (Worm.) Nort. & Ezekiel cf. p. 63.

Phyllosticta pirina on Pyrus baccata L. equals Coniothyrium pirinum (Sacc.) Sheld cf. p. 136.

167 Uromyces flectens on Trifolium pratense L. should be on T. repens L.

168 Cladochytrium Alismatis on Alisma subcordatum Raf. equals C. maculare (Wallr.) Graff. cf. p. 55.

172 Septoria Heraclei on Heracleum lanatum Michx. equals Cylindrosporium Heraclei E. & E. cf. p. 133.

173 Septoria ivaecola on Iva xanthifolia Nutt. Omit.

175 Cronartium Quercuum on Pinus spp. cf. C. Quercus (Brondeau) Schroet, "p.82" of Additions.

VII. DISEASES OF MISCELLANEOUS PLANTS

The parasitic fungi reported in this section are arranged under the scientific name of the host, on which they occur. The hosts are arranged alphabetically. All records, which were new or added to the information already published in the past two Surveys are reported here. In addition about one-tenth of the specimens added to the herbarium in the past year are reported. The number in curved brackets at the end of the item indicates the number under which the specimen is entered in the Division Herbarium. (The collections and exsiccatae in the Herbarium previous to 1929 are unnumbered). Some of these fungi and even some of the specimens have been reported in works readily available, but many of them have not been reported although specimens may be found in some herbaria. Time nor space did not permit of extending the list further. A very few saprophytic fungi are also added.

Acer saccharum Marsh.
Gloeosporium decolorans Ell. & Ev. July 28, Southwald Tp., Elgin Co., Ont. Coll. and Det. J. Dearness (1032)

Acer spicatum Lam.
Uncinula circinata Cke. & Pk. Sept. 18, Farmer's Rapids, Que. (1092)

Actaea rubra (Ait.) Willd.
Puccinia Clematidis (DC.) Lagerh. July 14, 1922, Treherne, Man.

Agropyron repens (L.) Beauv.
Phyllachora graminis (Pers.) Fuck. Sept. 16, Waterville, Que. Heavy.
Claviceps purpurea (Fr.) Tul. Sept., York county, N.B.

Agroseris sp.
Puccinia patruelis Arth. July 12, Elstow, Sask. (1039)

Agrostis tenuis
Tilletia decipiens (Pers.) Wint. Found Feb. 28 at Ottawa in a shipment of seed from the United States by Mr. Wright, Seed Branch. Det. H.T. Güssow and I.L. Conners. Source of seed unknown.

Alnus incana (L.) Moench.
Taphrina Alni-incanae (Kühn) Magn. Sept. 12, Mer Bleu, Ont. (1097). Aug. 28, Ste. Famille, Que. (1095). Sept. 16, Lennoxville, Que.; Sept. 25, Farmer's Rapids, Que. (1094). Common in New Brunswick.

Alnus incana (cont'd)
Erysiphe aggregata (Pk.) Farl. Aug. 28, Ste. Famille, Que.
Microsphaera Alni (Wallr.) Salm. Sept. 25, Farmer's Rapids, Que. (1085)
Phyllactinia corylea (Pers.) Karst. Aug. 25, Deschambault, Que.; Sept. 25, Farmer's Rapids, Que. (1086)

Amaranthus retroflexus L.
Cystopus Bliti (Biv.-Bern.) Lév. Aug. 19, Abbotsford and Aug. 25, Berthierville, Que. July 14, Vineland Station, Ont. July 16, Saskatoon, Sask. (1049)

Amelanchier sp.
Apiosporina Collinsii (Schw.) v. Höhn. Both conidial and perethecial stages in abundance. June 2, Kentville, N.S.

Apocynum scopulorum Greene
Cylindrosporium Apocyni Ell. & Ev. Aug. 6, Wroxton, Sask. (914). Found also at Saskatoon. Abundant.

Arabis retrofracta Greene
Puccinia monoica Arth. May 1, Kelowna, B.C. Aeciospores from this collection germinated normally by a germ tube, May 13 to 15 at Ottawa. (739)
Puccinia Holboellii (Hornem.) Rostr. May 1, Summerland, B.C. (740)

Aralia nudicaulis L.
Cercoseptoria leptosperma (Pk.) Petrak, July 22, Cochin, Sask. Det. Dr. Dearness.

Arisaema triphyllum (L.) Schott.
Uromyces Caladii (Schw.) Farl. July 4, Vineland Station, Ont. Pycnia and aecia collected May 19, 1930 at Vineland Station.

Artemisia sp. (prob. camporum Rydb.)
Puccinia universalis Arth. July 21, North Battleford, Sask. (1051)

Asparagus officinalis L. (cult.)
Cladosporium ?fasciculare Fr. Present on a stem spot, Sept. 29, Saskatoon, Sask. "May be this species" - Dr. Dearness.

Aster cordifolius L.
Puccinia Asteris Duby, June 2, 1930, Lincoln county, Ont. Heavy. Also collected on A. acuminatus Michx. at the same place.

Aster novae-angliae L.
Coloesporium Solidaginis (Schw.) Thüm. Sept. 7, Billings Bridge, Ont.

Aster spp.
Coloesporium Solidaginis (Schw.) Thüm. Aug. 20, Abbotsford and Sept. 17, Sherbrooke, Que. Moderate to heavy infection.

Aster ?longulus Sheld.
Erysiphe Cichoracearum DC. Sept. 1, Saskatoon, Sask. Heavy (1054)

Avena fatua L.
Ustilago Avenae (Pers.) Jens. Experimental weed garden, University, Saskatoon, Sask; 0.5 per cent infection. Simmonds (Sci. Agr. 11:78-79. 1930) reported that he had only found U. levis on wild oats in Canada (T.C. Vanterpool).

Betula sp.
Microsphaera Alni (Wallr.) Salm. Sept. 13, Emma Lake, Sask. (1061)

Bidens frondosa L.
Sphaerotheca Humuli (DC.) Burr. var. fuliginea (Schlecht.) Salm. Sept. 18, Farmer's Rapids, Que. (1091); Sept. 28, Hull, Que. (1068)

Bromus ciliatus L.
Urocystis Agropyri (Preuss.) Schroet. Aug. 1, Kepasiwin, Alta. Marshy place.

Chamaenerion spicatum (Lam.) S.F. Gray
Puccinia ludibunda Ell. & Ev. Fairly abundant July 10, on one small bluff near Kelliher, Sask. (1037)

Chenopodium album L.
Peronospora effusa (Grev.) Rabh. July 16, Saskatoon, Sask. Heavy. (1050)

Chiogines hispidula (L.) T. & G.
Chrysomyxa Chioginis Diet, June 16, Clova, Que. (881)

Chrysanthemum Leucanthemum L.
Yellows (Virus). Found frequently on this weed in York county, N.B.

Circaea alpina L.
Puccinia Circaeae Pers. Sept. 1, 1927, Crooked River, Sask. (1026)

Circaea pacifica Asch. & Magn.
Puccinia Circaeae Pers. Sept. 9, 1930. Langley Prairie, B.C. (1063)

Cirsium arvense (L.) Scop.
Puccinia suaveolens Rostr. June 6, Abbotsford, Que. About 25 per cent of the plants affected.

Claytonia virginica L.
Puccinia Mariae-Wilsoni G.W. Clinton April 19, Lincoln county, Ont. Aeciospores germinated by a germ tube. (R.Fitzpatrick)

Clematis ligusticifolia Nutt. (cult.)
Cercospora squalidula Pk. Aug. 13, 1928, Indian Head, Sask. (1060)

Cogswellia ?macrocarpa (Nutt.) M.E. Jones
Puccinia Jonesii Pk. May 1, Summerland, B.C.

Corylus sp.
Gloeosporium Coryli (Desm.) Sacc. July 3, Lennoxville, Que.
Septoria corylina Pk. Aug. 27, Ste. Famille, Que.
Cryptosporella anomala (Pk.) Sacc. June 15, Port Burwell, Ont. (861). (See U.S.P.D. Reporter Supp. 70. June 1, 1929, p. 257)

Crataegus sp.
Gymnosporangium clavipes Cke. & Pk. June 30, Bath, Ont. (886) and July 6, Arboretum, Ottawa, Ont.

Ctenophyllum pectinatum (Hook.) Rydb.
Physalospora aurantia Ell. & Ev. Oct. 4, Saskatoon, Sask.
Septoria psammophila Sacc. Sept. 7, 1930, Sutherland, Sask. On leaves and stems. Det. Dr. Dearness.

Eleagnus commutata Bernh.
Puccinia Caricis-Shepherdiae Davis, July 16, North Battleford, Sask. (1036)

Elymus virginicus L.
Puccinia Clematidis (DC.) Lagerh. Sept. 7, Billings Bridge. Ont.

Epilobium hirsutum L.
Pucciniastrum Epilobii Otth. Oct. 22, Kingston, Ont. (1069)

Equisetum affine Engelm.
Titeospora detospora (Sacc.) Bubak, June 12, Macdowall, Sask. Det. Dr. Dearness.

Erigeron sp.
Yellows (Virus) Common on this weed at Fredericton, N.B.

Fraxinus americana L.
Piggotia Fraxini Berk, & Curt. Aug. 25, Berthierville, Que. (1099)

Fraxinus nigra Marsh
Phyllactinia corylea (Pers.) Karst. Sept. 18, Farmer's Rapids, Que. (1083)

Gaultheria procumbens L.
Schizothyrium Gaultheriae (Curt.) v. Höhn (=Asterina Gaultheriae Curt.) Oct. 14, Cooksville, Ont. On plants for export. (1096)

Geranium Robertianum L.
Stigmatea Robertiani Fr. May 4, Vineland Station, Ont.

Glyceria grandis Wats.
Ustilago longissima (Sow.) Tul. Aug. 21, Colington, Alta.

Helianthus aridus Rydb.
Puccinia Helianthi Schw. II & III. Sept. 1, Saskatoon, Sask. Also collected at same time and place on H. petiolaris Nutt. and H. subtuberosus Bourgeau. (1055). On Helianthus annuus L. (cult.) Aug. 19, Broderick, Sask.

Hordeum sp. (cult.)
Helminthosporium teres Sacc. Aug. 14, Langham, Sask. (1045).

Hosackia denticulata Drew
Erysiphe Polygoni DC. July 16, 1930, Saanichton, B.C. (1071)

Impatiens sp.
Plasmopora obducens Schroet. Sept. 18, Farmer's Rapids, Que. (1093)

Juncus tenuis Willd.
Uromyces Silphii (Syd.) Arth. Sept. Prince county, P.E.I.

Lactuca pulchella (Pursh) DC.
Puccinia patruelis Arth. July 12, Elfros, Sask. (1038)
Puccinia minussensis Thüm. O. Kelowna, B.C. (738)

Lapsana communis L.
Puccinia Lapsanae Fuck. Oct. 22, Kingston, Ont.

Leontodon autumnalis L.
Yellows (Virus). Widespread in York county, N.B., seriously injuring flower heads, which are often contorted and lacking in seed. (J.L. Howatt) Also observed at Kentville, N.S.

Lepargyrea canadensis (L.) Greene
Sphaerotheca Humuli (DC.) Burr. Sept. 13, Emma Lake, Sask.

Lonicera tatarica L. (cult.)
Microsphaera Alni (Wallr.) Salm. var. Lonicerae (DC.) Salm. Sept. 3, Saskatoon, Sask. (1053)

Lycopus virginicus L.
Puccinia angustata Pk. Aug., Prince county, P.E.I. Common.

Matricaria inodora L.
Yellows (Virus) July 10, Sydney, N.S.

Mertensia paniculata (Ait.) G. Don.
Erysiphe Cichoracearum DC. Several plants were apparently killed in an experimental flower garden, Rosthern, Sask. on Aug. 1. (1040)

Osmorrhiza Claytoni (Michx.) Clarke
Puccinia Pimpinellae (Strauss) H. Mart. June 2, Lincoln county, Ont. Heavy.

Physalis heterophylla Nees
Puccinia Physalidis Pk. Aug. 18, Abbotsford, Que. About 50 per cent of the plants infected.

Pinus Banksiana Lamb.
Cronartium Comandrae Pk. June 12, Macdowall, Sask. (1035)

Plantago major L.
Erysiphe Cichoracearum DC. Aug. 26, Neuville, Que.
Yellows (Virus). Common at Fredericton, N.B.

Plantago Rugelii Done.
Erysiphe Cichoracearum DC. Sept. 25, Farmer's Rapids, Que. (1089)

Podophyllum peltatum L.
Puccinia Podophylli Schw. Vineland Station, Ont. Telia on basal scales, May 8; aecia on leaves, May 20; telia on leaves, June 19. (R. Fitzpatrick). May 18, 1930, Georgetown, Ont.

Polygonum pennsylvanicum L.
Ustilago utriculosa (Nees) Tul. Aug., Fredericton, N.B. Severe.

Polygonum Persicaria L.
Septoria Polygonorum Desm. Aug. 25, Berthierville, Que.
Ustilago utriculosa (Nees) Tul. Sept., Queens county, P.E.I.

Potentilla canadensis L.
Phragmidium Potentillae-canadensis Diet. May 8, Annapolis county, N.S.

Potentilla sp.
Pernospora Potentillae de Bary, Sept., Cavendish, P.E.I. Heavy.
Phragmidium Potentillae (Pers.) Karst. July 28, Saskatoon, Sask. Common (1042)

Prenanthes alba L.
Puccinia Orbicula Pk. & Clinton, July 8, Vineland Station, Ont.

Prunus virginiana L.
Nectria cinnabarina (Tode) Fr. Oct. 7, Magog, Que., on dead branches.

Pulsatilla ludoviciana (Nutt.) Heller
Puccinia Pulsatillae Kalchbr. Saskatoon, Sask. Heavy on a few plants.

Ranunculus acris L.
Erysiphe Polygoni DC. Sept. 25, Farmer's Rapids (1090) and Aug. 25, Berthierville, Que.

Ribes lacustre (Pers.) Poir.
Cronartium ribicola Fischer, Sept. 7, Billing's Bridge, Ont.

Ribes oxyacanthoides L.
Puccinia Pringsheimiana Kleb. July 10, Kelliher, Sask.

Rosa ?pisocarpa Gray
Phragmidium Rosae-Californicae Diet. Oct. 12, Salmon Arm, B.C. Coll. H.T. Güssow. (1100)

Rosa sp.
Phragmidium disciflorum (Tode) J.F. James, Oct. 22, Ottawa. Ont. (1064)

Rubus ?allegheniensis Porter
Gymnoconia Peckiana (Howe) Trotter, Aug. 25, Berthierville, Que.
Kuehneola albida (Kühn) Magn. also at Berthierville.

Rubus ?canadensis L.
Gymnoconia Peckiana (Howe) Trotter, Aug. 25, Berthierville, Que.
Kuehneola albida (Kühn) Magn. Also at Berthierville.

Rubus Idaeus L. (cult.) var. Herbert.
Septoria Rubi West. Oct. 6, Sutton West, Ont. (1034)

Rubus sp.
Phragmidium imitans Arth. III. Light infection on native red raspberry. Sept. 14, Emma Lake, Sask.
Gymnoconia Peckiana (Howe) Trotter. Very general and severe in Kings county and the eastern part of Annapolis, N.S.

Sabina horizontalis (Moench) Rydb.
Karschia deformata Pk. June 13, Beaver Creek, Sask. Det. Dr. Dearness.

Salix sp.
Rhytisma salicinum (Pers.) Fr. Aug. 13, Biggar, Sask.

Sambucus canadensis L.
Microsphaera Grossulariae (Wallr.) Lév. Sept. 25, Farmer's Rapids, Que. Some of the perithecia were parasitized by Cicinnobolus Cesatii de Bary. (1088)

Sambucus canadensis L. var. laciniata.
Cytospora sp. (near C. Sambuci Died.) Saskatoon, Sask. 1931. Det. Dr. Dearness.

Scirpus sp.
Hypoderma scirpinum DC. Sept. 13, Emma Lake, Sask. Det. Dr. Dearness.

Scutellaria laterifolia L.
Erysiphe Cichoracearum DC. Sept. 18, Farmer's Rapids, Que. (1084)

Setaria viridis (L.) Beauv.
Sclerospora graminicola (Sacc.) Schroet. July, Man., two fields, Common.

Solidago rugosa Mill.
Coleosporium Solidaginis (Schw.) Thüm, Aug. 25, Berthierville, Que.

Solidago rugosa (cont'd)
The rust was parasitized by Darluca filum (Biv.-Bern.) Cast. The rust was also collected on Solidago sp. at Emma Lake, Sask.; Abbotsford and Beebe, Que.; throughout New Brunswick, and on S. canadensis in Queens county, P.E.I.

Solidago spp.
Puccinia extensicola Plowr. June 9, Ottawa, Ont.
Erysiphe Cichoracearum DC. Sept. 7, Billings Bridge, Ont.

Spergula arvensis L.
Yellows (Virus). Common in York county, N.B.

Stipa viridula Trin.
Ustilago hypodytes (Schl.) Fr. July 28, 1927, Oak Lake, Man. (1081)
Claviceps purpurea (Fr.) Tul. July 31, 1928, Brandon, Man. (1082)

Symphoricarpos sp.
Puccinia Crandallii Pamm. & Hume, July 17, North Battleford, Sask. (1041) Common in Saskatchewan.

Taraxacum officinale Weber.
Puccinia Hieracii (Schum) Mart. July 31, Saskatoon, Sask. Common.
Ramularia Taraxaci Karst. July, Kentville, N.S. Not as common as usual.
Sphaerotheca Humuli (DC.) Burr. var. fuliginea (Schlecht.) Salm. Sept. 29, Saskatoon, Sask. Heavy.

Thermopsis rhombifolia (Nutt.) Richards.
Phoma thermopsidicola Henn. May 31, Saskatoon, Sask. Abundant on the dead stems of last year's growth. Det. Dr. Dearness.

Thuja occidentalis L.
Keithia thujina Durand, July 31, Biscotasing, Ont. Det. Irene Mounce. (1031)

Tilia americana L.
Uncinula Clintonii Pk. Sept. 25, Farmer's Rapids, Que.(1087)

Torresia odorata (L.) Hitchc.
Puccinia graminis Pers. Sept. 1, Saskatoon, Sask. Green vigorous plants, growing in a field of summer fallow among volunteer cereals, were heavily infected.

Trifolium hybridum L.
Uromyces Trifolii (Hedw.f.) Lév. July 31, Melfort, Sask. (1043) Polythrincium Trifolii Kunze also present.

Triticum aestivum L. (cult.)
Tilletia laevis Kühn Aug. 13, Lett, Sask. (1062)
T. Tritici (Bjerk.) Wint. Aug. 13, Lett, Sask. (1058)

Ulmus glabra Huds. var. Camperdownii Redh.
Phleospora ulmicola (Biv.-Bern.) Allesch. Sept. 28, Strathroy, Ont. Det. Irene Mounce. (1029)

Verbascum Blatteria L.
Septoria verbascicola Berk. & Curt. July 9, Vineland Station, Ont.

Vicia ?americana Muhl.
Uromyces coloradensis Ell. & Ev.O.I, old. Aug. 14, 1929, St. Gregor, Sask. (1024)

Vicia Gracca L.
Microsphaera Alni (Wallr.) Salm. Sept. 30, Abbotsford, Que. Moderate infection, but common.
Uromyces Fabae (Pers.) de Bary, Sept. 18, Abbotsford, Que. Heavy.

Viola pubescens Ait.
Puccinia Violae (Schum.) DC. Sept. 7, Billings Bridge, Ont. Also collected on Viola sp. Sept. 18, Abbotsford, Que.

Zea Mays L. (cult.)
Puccinia Sorghi Schw. Aug. 28, Ste. Anne de la Pocatière, Que. (1098)

Zizania palustris L.
Claviceps purpurea (Fr.) Tul. Common along St. John river about Fredericton, N.B. (J.L. Howatt)

Saprophytic Fungi

Ascotremella turbinata Seaver on dead wood, La Salle Woods, Montreal, Que. Sept. 23, Coll. H.A.C. Jackson, Det. Irene Mounce, confirmed, F.J. Seaver (1027); on decorticated beech, Farmer's Rapids, Que., Sept. 25. Det. Irene Mounce. (1028)

Mitrula irregularis (Pk.) Durand. Sept. 30, Branchley Beach. Coll. B. Hurst, Det. Irene Mounce (1030). Oct. 15, 1928, Childs Bush, near Hawthorne, Ont. (1077)

Patella scutellata (L.) Morgan, Between Swastika and Dane, Ont. Coll. L.O. Overholts, 13295; Det. Lilian Cash as Lachnea scutellata (L.) Gill. (1075)

Patella theleboloides (Alb. & Schw.) Seaver, Ont. 20, Merrifield's Corners, Que. On old cow dung in pastures (1065)

Peziza clypeata Schw. On rotten wood, Sept. 12, La Salle woods, Montreal, Que. Coll. H.A.C. Jackson, Det. Irene Mounce. (1033)

Spathularia clavata (Schaeff.) Sacc. In coniferous woods, Oct. 20, Merrifield's Corners, Que. (1067)

Tylostoma campestre Morgan. May 10, Sutherland, Sask. Sandy location. Det. Dr. Dearness.

Underwoodia columnaris Pk. Aug. 1, Agricultural College, Man. 1928. Coll. G.R. Bisby, (1080)

Urnula Craterium (Schw.) Fr. May 31, 1929, Agricultural College, Man. (1079)

INDEX OF HOSTS

Only the names of the cultivated plants have been included in this index. For diseases on plants not under cultivation the section on "Diseases of Miscellaneous Plants" should be consulted.

Alfalfa 23
Apple 59
Apricot 66
Arbutus 89
Ash 81
Asparagus 32

Barley 17
Balsam Fir 82
Basswood 81
Bean 32
Bean, Broad 34
Beech 81
Beet 34
Blackberry 66
Blueberry 67
Blue Vervain 102
Butternut 81

Cabbage 35
Cantaloupe 36
Caragana 89
Carnation 89
Carrot 37
Cauliflower 37
Cedar 81
Celery 37
Cherry 67
Chestnut 82
China Aster 89
Chrysanthemum 91
Clover, Common 25
Clover, Sweet 27
Corn 27
Cucumber 39
Currant 68

Dahlia 92

Egg Plant 39
Elder 82
Elm 82
English Ivy 92

Firethorn 83
Flax 28
Flowering Currant 92

Geranium 92
Ginseng 40
Gladiolus 93
Goldenglow 93
Gooseberry 70
Grape 70
Grasses, Cultivated 30

Hawthorn 83
Hollyhock 93
Honeysuckle 94
Hop 40
Horsechestnut 83
Hydrangea 95

Iris 95

Japanese Barberry 96
Jerusalem Artichoke 40

Larkspur 96
Lettuce 40
Lilac 97
Lily 97
Loganberry 71
Lupine 97

Mangel 29
Maple 82
Mountain Ash 84
Mushroom 41

Narcissus 97

Oak 84
Oats 12
Onion 41
Orange 71

Pansy 98
Parsley 42
Pea 42
Peach 71
Pear 72
Peony 98
Pepper 43
Petunia 99
Phlox 99
Pine 84
Pine, White 84,105
Plum 73
Poplar 86
Potato 43

Quince 75

Raspberry 76
Rhubarb 51
Rose 99
Rutabaga 51
Rye 21

Salpiglossis 100
Sandcherry 79
Snapdragon 101
Spinach 52
Spruce 86
Squash 52
Strawberry 79
Sunflower 29
Sweet Pea 101
Swiss Chard 52

Tobacco 52
Tomato 54
Tulip 102
Turnip 57

Virginia Creeper 103

Wheat 1
Willow 87
Wisteria 103

Yucca 103

Zinnia 103