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THIRTEENTH ANNUAL

REPORT

OF THE

CANADIAN

PLANT DISEASE SURVEY

1933

Compiled by

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FOREWARD

Although the present annual report of the Canadian Plant Disease Survey is the thirteenth to be issued, the Survey will have been in operation for 15 years with the collection of the data for 1934, as the first report covered the crop season of 1920. It would therefore seem desirable to briefly consider what has been accomplished and what improvements might be made. Probably the chief value of the Survey has been in providing a medium, in which diseases new to Canada might be promptly reported. Until its inception, such observations appeared in a variety of publications or were left unrecorded. The number of diseases new to Canada or new to other provinces within the Dominion being recorded each year is evidence of its stimulating influence. In recent years the observations have been compiled promptly as the report of any given year has been ready for distribution about April 1st of the succeeding year. In the Survey, serious outbreaks of disease coming to the attention of the plant pathologists are also likely to be reported. The reports possess, therefore, considerable reference value.

The full scope of the Survey has only been reached in the study of the cereal diseases. In the three prairie provinces where these crops are of supreme importance, definite trips have been made annually to observe and record the prevalence of disease. The notes thus obtained report the average prevalence of the individual diseases as well as their more infrequent occurrence in epidemic form. Observations on cereal diseases from the beginning have been more full and complete thanks to the work of Prof. W.P. Fraser and Dr. G.R. Bisby, who are inveterate observors and collectors. More recently the Plant Disease Survey has become a well-planned project taking its place in the programme along side the research activities in both the Provincial and Dominion Laboratories. Besides the cereal diseases those of tobacco are also well reported.

Probably the most outstanding need at the present time is similar surveys of the diseases on the other crops. The Potato Inspection Service report the relative importance of the commoner diseases as they affect the growing of certified seed potatoes, but too little is known about the crop in general. Again little is known concerning the prevalence of vegetable diseases in the market garden or canning crop sections of Canada. If crops of this type cannot be covered every year, certain areas might be surveyed one year and others in a second, but specific survey trips to report the prevalence of each and every disease are much needed.

Although it might be advisable to summarize several years observations in a printed publication, I believe that, for the

present, attention should be focused on improvement of the annual reports. Following the suggestions made at a meeting of the Associate Committee on Field Crop Diseases of the National Research Council at Winnipeg in 1933, two new sections have been added as an introduction to the report proper. These are "New or Noteworthy Diseases" and "The Weather and its Influence on Plant Diseases".

In addition to the regular sections of the Survey, Dr. G.R. Bisby has contributed a second supplimentary list of the fungi he has found in Manitoba since the publication of the well-known book "The Fungi of Manitoba", of which he is the senior author. The second special section entitled "A Check List of the Diseases of Forest and Shade Trees" was prepared by Mr. A.W. McCallum. Of the fungi definitely known to occur in Canada, about 40% are represented by specimens in the Mycological or Forest Herbarium at Ottawa. We are especially indebted to Dr. Irene Mounce for the records on the Polyporaceae incorporated in this list. It is hoped the preparation of this Check List will stimulate interest in the collection of fungi attacking our trees and submission of specimens to Ottawa.

Similarly, even a superficial examination of the Herbarium will reveal a distinct need of more collecting of our commoner fungi, attacking cultivated plants. Frequently the only specimens that we have were collected beyond the confines of Canada. To facilitate reference, an index of the diseases reported and published in the Survey is being prepared and to this, a record of the Canadian specimens we have in our Herbarium, will be added. It is hoped that with this information in hand I shall be able to make more specific requests for specimens or data on many of our diseases, which will greatly improve future reports.

April 3, 1934.
Division of Botany,
Ottawa, Canada.

I. L. Conners,
Plant Pathologist.

New or Noteworthy Diseases

In this place, diseases new to Canada or to provinces other than those, from which they have already been reported, are brought together. In addition, notes are included on several diseases, which have attracted attention for one reason or another in the past year.

To the long list of cereal diseases a new foot rot of oats has been added by Sanford from Alberta. The symptoms of the disease have been described and illustrated by him (Sc. Agr. 14:50-51. 1933). Since the publication of this note he has found that there are apparently two organisms, Fusarium Equeseti and an unknown dark sclerotia-forming fungus, associated with the disease. Experiments to determine the pathogenicity of these fungi, singly and in combination, have not yet been completed. The disease was common in the Edmonton district in 1933, and caused severe damage in some fields.

Downy mildew (Peronospora aestivalis) of alfalfa was probably the most interesting forage crop disease in the past year. Before 1932, it was apparently of little economic importance, although it had been reported on alfalfa from nearly every province in Canada. In that year, however, the Lytton strain originated at Lytton, B.C. was severely affected at Ottawa, while other varieties were only slightly diseased. Again in 1933, this strain was noticeably affected not only at Ottawa, but also at 10 other stations scattered from Alberta to Quebec. From these observations it would appear that downy mildew might become a serious disease and has not done so before, due to the high resistance of the commonly grown varieties.

Smut (Ustilago striaeformis) was found on two new hosts in Manitoba for the first time. It affected Kentucky blue grass at M.A.C., Winnipeg, and timothy near Beausejour and at Winnipeg. It was previously reported from Manitoba on Beckmannia erucaeformis and from Ontario on timothy. Specimens on Kentucky blue grass from a lawn and on timothy are in the Herbarium from Ottawa, Ont.

Smut (Ustilago bromivora) was collected on western rye grass at Nappan, N.S. This smut has not been reported previously outside of the Prairie provinces.

Leaf spot (Septoria Agropyri E.& E.) heavily infected one field of western rye grass in zone 10 in Alberta. It was also reported on Agropyron sp. at Pense, Sask. It was previously reported on A. tenerum at Morden, and A. Richarsoni at Roblin, Man., by Bisby et al (Fungi of Manitoba p. 140).

A leaf spot caused by Ovularia sp. was common on a New Zealand

variety of perennial rye grass (Lolium perenne) at Saanichton, B.C., while it was not observed on local varieties. O. Lolii Volkart is reported on this host from Switzerland.

The observations on turf diseases deserve mention. Browning root rot (Pythium sp.) caused serious damage to a lawn of crested wheat grass (Agropyron cristatum) at Winnipeg, Man. The latter thrives in dry situations and consequently it is being grown more and more each year. Rhizoctonia Solani was destructive to a turf of Poa annua at St. Catharines, Ont., while both Pythium and Rhizoctonia caused some damage to the greens of the Saskatoon Bowling Club, Saskatoon, Sask.

Records of a few new vegetable diseases were received this year. Marginal leaf spot (Pseudomonas marginalis) caused severe damage to lettuce at Ancaster, Ont. A dry fruit rot (Alternaria sp.) of eggplant was observed several times in Lincoln county, Ont. Not only were large external lesions formed, but the internal tissue was invaded. The foliage was free of any Alternaria leaf spot. Sclerotium disease (Sclerotium bataticola) was found affecting two pepper fruits on a farm in Lincoln county, Ont. The aecia of Puccinia Phragmitis were collected for the first time on rhubarb in Manitoba. They were abundant on some varieties at Brandon and the rust was rather common at scattered points throughout the province.

Besides these new vegetable diseases certain others may well be reported. Powdery scab (Spongospora subterranea) was found again this year in British Columbia. At the time the vegetable disease section was being written, it was thought to be the first report for British Columbia; later, however, I find that it was reported in 1922 (P.D.S. 2:60). It must be extremely rare in that province. A crown rot was reported for the past two years at Saskatoon. Isolations from the diseased tissue yielded a Fusarium. Those made this year were identified as F. bulbigenum. A soft rot (Pythium sp.) has been destructive to the seed pieces after they were planted and caused high percentages of misses in some fields in British Columbia. The organism was identified this year as Pythium ultimum.

Among the fruit diseases the only new one to be reported was false blossom (virus) of cranberry. Its appearance in the commercial bogs of Nova Scotia may well cause apprehension of the ultimate success of cranberry growing in Canada, as this disease is thought to be responsible for the decline of 30% in the yield in the cranberry bogs of New Jersey since 1923, when they attained their highest productivity. Fire blight (Bacillus amylovorus) appeared in epidemic form at Saskatoon and other points in

Saskatchewan in 1933, although it was reported only last year for the first time in this province. Both blossom and twig infection was severe in the University orchards at Saskatoon. It also affected a few twigs on plum trees adjacent to apples in the same orchard and generally infected the flowering crabapples in a border at Regina. In Manitoba the disease caused serious twig blight of seedling apple trees at Morden and was found affecting Prunus nigra at Dauphin. An outstanding case of Xanthosis? (virus) of strawberries was observed on one farm at Stamford, Ont. The majority of the plants exhibited unmistakeable, although not distinctly defined symptoms, resembling those of "Xanthosis" of Plakidas and the "Yellow-edge" disease in England, and these observations were confirmed by experimentally transmitting the disease to healthy plants. However, this was the only case observed by Dr. R.V. Harris in which, by leaf symptoms alone, virus attack could be diagnosed as a major cause of a deterioration of serious economic importance. Blue stripe wilt (Verticillium sp.) was found affecting a few plants at Macdonald College, Que. Apart from a doubtful record from Rimouski county in 1926, this is probably the first record of this disease in Quebec.

Anther smut (Ustilago violacea) was found affecting carnations in a greenhouse at Toronto. This is the first report of this smut on carnation in Canada or the United States. Apparently it is a disease of minor importance on this host in Europe. Bacterial blight (Bacterium(Pseudomonas) gummisudans) affected gladiolus in a garden at Brantford, Ont., in 1932. Although this is the first report of this disease to the Survey, Drayton (Rept. Dominion Botanist for 1927, p. 28, 1928) found it in 2 plantations at Kitchener, Ont., in 1927. Although rust (Puccinia Malvacearum) has been reported on hollyhock at Winnipeg, Man., according to Bisby et al (Fungi Man. p. 85) it was not observed from 1920 until the fall of 1932, when it appeared at the Agricultural College. It was found again this year and became very prevalent during the season. It also heavily infected a cultivated mallow in a Winnipeg garden.

Attention is directed to the unusual number of hosts reported to be attacked by Rhizoctonia Solani this year. Below are listed the name of the disease, the host, and the place of appearance. Brown patch in a turf of Poa annua at St. Catharines, Ont., p. 19 and in bowling greens at Saskatoon, Sask., p.19; wire stem in cabbage at Winnipeg, Man., p.23, and in cauliflower at Saskatoon Sask., p. 24; bottom rot of lettuce in Jacques Cartier county, Que., p.27; rhizoctonia in potato, p.29; damping off of tobacco seedlings in a greenhouse, Norfolk county, Ont., p.36; sore shin of tobacco in Norfolk county, Ont. p.37; storage rot of turnip, Queens county, P.E.I., p.41; seedling blight of plum, Saskatoon, Sask., p.55; crown rot of garden heliotrope, Saskatoon, Sask. p.67.

The Weather and Its Influence on Plant Diseases.

In British Columbia the season was in general dry, especially during August, the interior valleys, particularly the Okanagan and parts of the Kootenay, being drier than usual. However, in the latter half of October it was very wet on the coast and considerable snow and rain fell in the interior. The temperature was below normal during the early half of the season, but the weather was unusually warm during July and August.

On Vancouver island the dry warm weather in April checked the spread of tulip blight, which caused severe damage in 1932. Although conditions were favourable in May, very little infection occurred, due to the destruction of the inoculum in the preceding dry month.

In the Fraser valley on account of the lower precipitation and an increase in the number of hours of sunshine, downy mildew on hop was not severe and the disease was easily kept in check by spraying.

In the Okanagan valley the effect of the weather was chiefly of a direct nature. A few rain showers falling when the fruit was ready to pick caused the cherries to split, resulting in considerable loss. Hail accompanied in some places by a gale reduced the quality of applesin several orchards to the lowest grade on account of skin cuts and bruises. An early frost with snow caused the fruit to fall from the trees in some districts and the weight of the snow broke many trees. Rainy weather at the time when the onion crop was ready to harvest favoured an outbreak of neck rot, which caused enormous losses.

Although the crop season began in Alberta with normal temperature and rainfall, in each succeeding month it became progressively hotter and drier, especially in the southern part of the grain-growing area. Northeast, east and south from Calgary the season was unusually dry. In consequence there was a general crop failure, except where the land was irrigated. Similar conditions although less severe, occurred east of a line from Calgary, Stettler and Hardesty to Wainwright. On account of the drought, this area was not surveyed. West and northwest of this line moisture became progressively more abundant. A good crop was harvested from Didsbury northward, north of the line from Edmonton to Lloydminister, and in the Peace River area. In the latter district, the crop which matured about two weeks later than that in central Alberta, suffered considerably from frost. In general, August was a dry month, the crop matured early, foliage-borne diseases were reduced and foot rots were checked. In 1933 the

survey was confined chiefly to the area adjacent to Edmonton.

In Saskatchewan the spring was early except in the north and northeast, with fair moisture conditions prevailing throughout the province. Good rains fell in the latter part of May, except in the west central portion. Cool weather preceded these rains and no soil drifting occurred. The first fortnight of June was comparatively cool and crop growth was good. From then on, dry hot weather set in and continued until well into August in all parts of Saskatchewan, except the east central, northeast and northwest districts, which were favoured with good rains. As a result, there was almost a crop failure through the greater part of Saskatchewan, except in those districts where rain fell as indicated above. During the last few days of August and the beginning of September, the long drought was broken by general rains.

Here again as in Alberta, the weather had much more direct influence on the crop on account of the serious shortage of moisture and high temperatures prevailing than it had indirectly by favouring parasitic fungi. Drought appears to have little affect on the prevalence of Helminthosporium-Fusarium foot rot, as the disease was widespread in the dry areas, where its symptoms, however, were not easily distinguished from those of drought injury.

Browning root rot, on the other hand, seems to be greatly influenced by the sequence of moisture and temperature conditions, at least in the expression of its symptoms, if the observations made in Saskatchewan this year are any clue. It would appear that moisture must be abundant and a fairly high air temperature be reached before the disease makes its appearance. Where abundant moisture is present, new roots are put out and the plants recover. Where it is lacking, drought symptoms replace those of browning root rot. The importance of this disease may be underestimated on account of the shortness of the period, during which the symptoms are visible, but even where it only retards the crop for a brief period it delays the maturity of the crop and lengthens the period during which other fungi or unfavourable weather may act.

In Manitoba, conditions were dry again in the southwest, moist in the northwest and north and in the vicinity of Winnipeg a damp spring was followed by a dry summer. In the Winnipeg area several diseases such as powdery mildews, plum pocket and certain rusts started early and were abundant, but were subsequently largely checked by the dry weather. The aecia of rusts on cultivated plants such as gooseberry, lettuce and rhubarb were more abundant than usual. Wheat stem rust occurred only in traces and caused no appreciable damage. In fact, wheat has not been so free of stem rust in any previous year during the past decade

Scarcity of inoculum during the early part of the season and dry weather later, which caused the crop to ripen early and was unfavourable for rust development, probably accounted for its scarcity. Stem rust was correspondingly rare on the other cereals.

In the north the damp weather allowed an unusual development of downy mildews of wild plants. Plasmopora Geranii and P. pygmaea were found for the first time and also the hosts Geum and Veronica were first found infected by downy mildews previously known. These records are all from Berens River and Swan River. It might be pointed out that downy mildews are rarely injurious to cultivated plants in Manitoba.

The past season was considerably warmer and drier than usual in most parts of Ontario. In Lincoln county the warm dry weather in the early part of the season tended to keep early varieties of peaches, which are usually affected, relatively free of brown rot. However, the low rainfall of July was followed by considerable excess in August, the weather becoming very favourable for the disease and for the rapid maturing of the fruit. Consequently, brown rot became epidemic, especially in mid-season varieties. It was the worst epidemic of brown rot in 12 years and was considered by some growers to be the worst ever experienced. Blossom-end rot of tomato was widespread and prevalent in many districts in Western Ontario. Weather conditions undoubtedly favoured the development of the disease. Tobacco suffered from wind and hail, and frost, to some extent, while black root rot was almost absent on account of the dry weather. Raspberry mosaic was masked during the hot months.

In Quebec the rainfall and temperature were about normal in the Montreal district, but over the rest of the province, the weather was unusually dry and warm, until the end of August or later. In the eastern part the crops suffered from lack of moisture up to the middle of September. In the apple orchards in western Quebec slight delays in the application of the pink and calyx sprays due to rain caused considerable scab infection on the fruit. The dry weather, nevertheless, prevented secondary spread, but cool weather and rain at the end of August and beginning of September favoured late infection. Fire blight on apple and anthracnose on raspberry was similarly checked by the dry weather. Freezing and thawing of the ground during January and February caused some injury to apple orchards in eastern Quebec.

In the Maritime provinces the growing season was generally warm and dry. There was very little rain either in July or the

first three weeks of August in Prince Edward Island or parts of Nova Scotia. However, in September rain fell in excess of normal and October was also wet. Early blight caused severe damage to potatoes in the Annapolis valley and was apparently favoured by the drought. On the other hand, this was one of the worst late blight years on record in Prince Edward Island, the plentiful rains late in the season being favourable for its development. Strong northwest gales caused immense damage to orchards in the Annapolis valley on October 8, while considerable loss resulted in November in these provinces on account of vegetable and root crops being frozen in the ground.

I. DISEASES OF CEREAL CROPS

WHEAT

STEM RUST - Puccinia graminis Pers.

B.C.- Slight infections of stem rust were observed in September; it caused little damage.

Alta.- No stem rust was found on wheat until early in September. From that time local, light to medium infections were present in a few very late fields.

Sask.- Stem rust was reported from 6 fields out of 134 examined. Infection was seldom more than a trace and the damage was practically nil. It was first collected on wheat at Indian Head on August 10, then at Unity and Muenster on August 11, at Saskatoon on August 23 and at Candle Lake on August 27.

Man.- In no year during the past decade has wheat been so free from stem rust. Although a trace was present throughout Manitoba, no appreciable damage resulted. Scarcity of inoculum during the early part of the season, early ripening of the crop and unfavourable moisture conditions probably accounted for the failure of stem rust to develop in 1933.

Traces of stem rust were found at Morden on June 23 and except in a few plots at this place, never more than a trace could be found at any time in any part of the province.

Que.- A trace to 2 per cent of stem rust was observed in Kamouraska county.

N.B.- Stem rust was reported from Westmoreland, Gloucester, Victoria, Carleton, York and Sunbury counties. Light infections occurred on the varieties Huron, Garnet, Belokoloska and White Russian at the Experimental Station, Fredericton.

P.E.I.- Stem rust first appeared in most fields after August 25, when the major part of the wheat crop was ripening. In consequence, very little damage was done except in fields which were sown late. A severe outbreak occurred in such fields in the western part of Prince county, while stem rust had practically destroyed several fields of wheat, which were examined Sept. 1 at Orwell, Earnscliffe and Wood Islands in Queens county.

LEAF RUST - Puccinia triticina Erikss.

B.C.- Leaf rust was general in August, but caused slight damage.

Alta.- Leaf rust infections varied from a trace to medium in a few green fields. Rust was reported from 4 fields out of 247 examined.

Sask.- Leaf rust was easily found in southeastern Saskatchewan on July 17, but its prevalence later in the season was not reported.

Man.- Leaf rust was first observed at Burnside on June 7. By June 17 a sprinkling of this rust was present throughout Manitoba and towards the latter part of the season it was quite severe in many fields, infections as high as 80 per cent being recorded. The average damage varied from medium in the south to

severe in the northern sections.

Ont.- Leaf rust was first observed in the Ottawa district on June 21. Later in the season it was abundant on the plots at the Central Experimental Farm.

Que.- Leaf rust was found at Macdonald College on June 28 on both winter and spring wheats. It increased until the plants were mature, individual leaves often showing 30 to 40 per cent infection.

N.B.- Leaf rust was reported from 12 fields in northern New Brunswick and from 4 in the southern part of the province The following varieties of wheat grown at the Experimental Station, Fredericton, were classified according to their rust reaction: (1) Slightly infected - Pentad x Marquis 1000, Mindum, Federation, Reliance, Belokoloska, Kenya, Governor, Whiteheads, Charlottetown 123, Caesium, Arnautka, Lutescens, Navara, Chelsea; (2) Severely infected - White Russian, Huron, Garnet, Marquis, Ceres, Early Red Fife, Quality and Reward.

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

Alta.- No reports of stripe rust on wheat were recorded. It was apparently not present in the Edmonton district on Hordeum jubatum until August 3 and was relatively scarce at any time in north-central Alberta. Between August 27 and 30, traces to light infections were found at Athabasca, Slave Lake, Peace River, Dunvegan and Grand Prairie. Stripe rust was very scarce in southern Alberta due to the dry conditions.

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

In addition to the field reports from Alberta and British Columbia, data were collected from the records of the Western Grain Inspection Division on the percentage of cars of "smutty" wheat inspected between August 1 and October 31, 1933. Although Hard Red Spring is grown in all three Prairies provinces, most of the Amber Durum is produced in Manitoba. These data were kindly supplied by Dr. W. F. Hanna.

Table 1. Wheat Bunt in Western Canada

Classes of Wheat	Percentage of "smutty" cars
Hard Red Spring	0.3%
Alberta Red Winter	10.5%
White Spring	1.6%
Amber Durum	0.5%
All Classes	0.3%

If the percentages reported in Table 1 are compared with

those of last year (Ann. Rept. Can Plant Dis. Survey 12:5) it is evident that wheat bunt continues to be less prevalent each succeeding year since the very heavy losses from bunt in 1930. The percentage of cars graded "smutty" upon inspection during the first quarter of the crop year, August 1 to October 31, in each year since 1930 for all classes of wheat are: 1930, 2.8%; 1931, 1.4%; 1932, 0.6%; and 1933, 0.3%. The corresponding figures for Amber Durum are: 1930, 16.6%; 1931, 5.6%; 1932, 1.2%; 1933 0.5%. The marked reduction in "smutty" wheat is probably the result of the campaign conducted in recent years in Western Canada to control the disease by seed treatment especially in durum wheat.

Although Alberta Red Winter constitutes only a small fraction of the wheat grown in Western Canada, it is worthy of note that some 10 per cent of the crop grades "smutty" each year. It may well indicate that soil infection makes control by seed treatment ineffective. In any event, a variety of winter wheat highly resistant to bunt and suitable to the area would be desirable.

B.C.- Bunt was found here and there in the Fraser River valley. Some fields showed as many as 15% of the heads infected.

Alta.- A trace of bunt was reported from 5 fields out of 257 examined in zones 9 and 10 (See 1930 Report for a description of these zones).

LOOSE SMUT - Ustilago Tritici (Pers.) Jens.

B.C.- Loose smut was found in British Columbia, but in no field was it causing significant losses.

Alta.- A trace of damage was caused by loose smut in 18 fields out of 257 examined, chiefly in zones 9 and 10.

Sask.- Loose smut was recorded from only one field out of 134 examined. The damage was less than 1%.

Man.- Loose smut was found in 60 per cent or 18 fields out of 30 examined, the average damage being 1.2 per cent. The highest infection was in a field of Reward, where 9% of the heads were destroyed by smut.

Que.- A trace to 2% of loose smut was present in the spring wheat at Macdonald College. Infections of loose smut as high as 5 per cent were observed in Kamouraska county.

N.B.- A trace of loose smut was found in Huron in an experimental plot at Fredericton.

P.E.I.- A survey showed that loose smut was present throughout the province, every field examined being infected. As infections ranging from 0.5% to 48.5% were recorded, the loss from smut must have been considerable.

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

Man.- Black chaff caused a trace of damage in 72 per cent or 26 fields out of 36 examined.

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

Alta.- A trace of basal glume rot was found in 5 fields out of 257 examined, all in zone 10.

Sask.- Basal glume rot was recorded in one field in zone 12; damage was a trace. A diseased sample of wheat was also sent from Clair.

Man.- Basal glume rot was found in 3 fields out of 30 examined. A trace of infection was found at Elm Creek and Morris, while 25% of the heads were diseased in a field at Grandview.

ERGOT - Claviceps purpurea (Fr.) Tul.

According to the records of the Western Grain Inspection Division, ergot was recorded in 1.4% or 72 cars out of 5,104 of Amber Durum inspected from August 1, 1931 to July 31, 1932 Again, ergot was recorded in 0.4% or 25 cars out of 6,908 inspected from August 1, 1932 to January 31, 1933.

Alta.- A trace of ergot was found in 2 fields out of 257 examined.

Sask.- A correspondent reported that his Reward wheat grown at Springside was badly infected with ergot in 1932. He stated that 6 to 8 sclerotia were present per bushel in the threshed grain. On account of the dry season the seed germinated poorly and in consequence the stand was uneven and ripened slowly (3053)

Man.- A trace of ergot was reported in 2 fields of durum wheat. It was also observed in the experimental plots at Winnipeg on Einkorn, Iumillo x Hope F_3, Reward x (Pentad x Marquis) F_2, and Pentad x Marquis.

POWDERY MILDEW - Erysiphe graminis DC.

B.C.- Powdery mildew was present on wheat on Vancouver Island and in the Fraser valley, but it caused little damage.

Alta.- A light infection of powdery mildew was observed in the experimental plots at Edmonton and Lacombe.

Que.- Powdery mildew moderately to severely infected several varieties of winter wheat in the plots at Macdonald College; it caused some reduction in yield. It was first observed on May 17 and by June 2, 50% of the stems were infected 100 per cent.

GLUME BLOTCH - Septoria nodorum Berk.

Alta.- A trace of glume blotch was reported from 10 fields out of 257 examined.

SPECKLED LEAF BLOTCH - Septoria Tritici Desm.

B.C.- Speckled leaf blotch was present on wheat, but caused slight damage.

Alta.- Light to medium infection of this leaf blotch was common in most fields examined. Some varieties were heavily infected in the plots at Edmonton.

FOOT ROTS

Alta.- Take-all (Ophiobolus graminis Sacc.) was found in 34.2% or 88 fields out of 257 examined, in zones 9, 10, 11 and 12. The average damage in the infected fields was 5.5%, while the maximum damage observed was 50% in a field in zone 11. The southern half of the province was not surveyed as the extremely dry conditions, to which the crop was subjected, seriously obsecured the presence of the disease.

Foot rot caused by Helminthosporium sativum Pamm. King & Bakke and Fusarium spp. was reported from 58% or 149 fields out of 257 examined in zones 9 to 12, the average damage in the infected fields was estimated to be 0.8%.

Sask.- Some take-all was found near Muenster in plots, where excavation studies were made. It is probable that the disease was present in the eastern and northeastern sections of the province, but districts having normal or abundant rainfall were not surveyed.

Foot rot attributed to Helminthosporium sativum and Fusarium spp., was reported in 87% or 117 fields out of 134 examined in zones 1, 2, 7, 9, and 11. It was estimated that 35.8% of the plants were infected and the damage was slight. In 7 different fields, however, 90% or more of the plants were infected. The disease was widespread in the dry areas, where its symptoms were with difficulty distinguished from those of drought injury.

Man.- Foot rot caused by Helminthosporium and Fusarium spp. was reported from 67% or 107 fields out of 157 inspected. The rate of infection was: trace, 32 fields; slight, 25; medium, 32; and severe, 18.

Take-all was not recorded in Manitoba in 1933.

Ont.- In a field of mixed Niger and Red Rock wheat in the Chatham district, 50% of the crop lodged. Many plants showed distinct foot rot symptoms, but no pathogenic organisms were isolated.

BROWNING ROOT ROT - Pythium spp.

Sask- Browning root rot appeared very suddenly following a few hot days at the end of May and the beginning of June. In the Saskatoon area and in adjacent districts to the north and east, the crop suffered the heaviest attack from this disease that Prof. Vanterpool has seen during the 5 years that he has been studying this disease. The damage was severe; a distinct retardation of seedling growth was evident. The "browning" symptoms were visible this year for a very short period, approximately two weeks in most areas. At some distince to the north and east from Saskatoon, where there was plenty of rainfall, the crop rapidly recovered its normal appearance, but towards the dried out areas, where a severe drought followed in the early summer, the symptoms soon merged into those of drought. Saskatoon and the area immediately to the north and east lay between these two zones and this may account for its unusual conspicuousness

in this intermediate belt in 1933. The fields about Scott were almost free from browning root rot, but north of Unity some very severely diseased fields were examined. In addition the disease was found in zones 1 and 2. (See also the report of its presence on certain grasses p. 20 below).

Man.- A field near Brandon was found severely infected with browning root rot on July 7. In addition, a field at Glenboro and another at Holland apparently were similarly affected.

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

Que.- A trace to 1% of the heads were found infected in a variety of spring wheat at Macdonald College on July 14.

P.E.I.- Head blight was observed on Huron wheat on July 20, an unusually early date for its appearance, when 0.5% of the heads were found affected.

SPOT BLOTCH - Helminthosporium sativum Pamm. King & Bakke

Man.- A trace of spot blotch was found on the leaves in most fields of wheat examined. A field at Brunkild had turned a yellow-brown colour on account of the disease.

PSEUDO BLACK CHAFF - Non-parasitic

A comprehensive account of this discolouration has been published by Broadfoot and Robertson (Sc. Agr. 13:512-514. 1933). In addition to the report by Henry in the Canadian Plant Disease Survey for 1929 under the name "black glumes" it has been mentioned in the 1931 and 1932 Reports as "glume darkening". It was found this year in Alberta in practically all fields of Reward wheat examined.

LEAF SPOT - Undetermined

Sask.- Eight fields out of 134 examined were slightly infected by leaf spot, the cause of which was undetermined.

OATS

STEM RUST - Puccinia graminis Pers.

B.C.- Stem rust was general, but it caused slight damage.

Alta.- Stem rust did not appear until very late in the season and only a trace of infection was observed in 2 fields.

Sask.- A trace of stem rust was found at Indian Head on July 17, fully 3 weeks before it was observed on wheat. Its later spread was not reported.

Man.- Stem rust was first recorded on oats on July 18. It was somewhat more abundant than stem rust on wheat, but not severe enough to damage early oats. Very late crops of oats were slightly damaged.

Ont.- Individual stems of oats showed up to 40% of rust

near Ottawa on July 18, the average infection being 1%. Later observations were not made.

Que.- Most fields were only slightly infected with stem rust at Macdonald College. In one field sown very late, infection ranged from a trace to 65%.

N.B.- A trace of stem rust was found in Westmoreland, York Sunbury, Victoria and Queens counties.

P.E.I.- Stem rust was first observed on August 25. While the disease was of no consequence in early sown oats, it caused severe damage in late fields. All varieties grown on the 42 farms visited in the province were affected.

CROWN RUST - Puccinia coronata Corda

Man.- Although a trace of crown rust was present throughout the agricultural section of Manitoba in 1933, the infections were light and scattered, and caused no damage. It was first observed on July 7 at Calder.

Que.- In Kamouraska county crown rust infections varied from slight to severe; the latter were found in fields on wet soil.

N.B.- Traces of crown rust were found in 5 counties; a field of Victory oats was moderately infected at the Experimental Station, Fredericton.

N.S.- A trace of crown rust was first observed on August 17 in Colchester county; a very light infection was seen later in Halifax county.

P.E.I.- Crown rust caused a trace to severe damage in all counties. Although buckthorns are found at Charlottetown, Summerside, Kensington and on many farms throughout the province, the aecial stage was not collected this year.

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

B.C.- Both loose and covered smut are general and cause considerable damage on account of the failure of the farmer to treat his seed.

Alta.- Covered smut was present in 20% or 27 fields out of 135 examined, the average damage being 4% in the infected fields. The highest infections were 30 and 25% in zone 10 and 20% in zone 9.

A trace of loose smut was found in only 2 fields out of 135 examined.

Sask.- No reports of oat smuts were made this year.

Man.- Covered smut was reported from 47% or 20 out of 42 fields examined; the average infection being 1.2%. The highest infection observed was 10%.

Loose smut was present in 28% or 12 out of 42 fields examined. The average damage was a trace and the highest infection 5%.

Que.- In the Montreal district loose smut was not difficult to find; infections varied from a trace to 5%. In Kamouraska county the infections were from a trace to 10%. No covered smut was reported.

N.B.- A trace of covered smut was observed in Alaska, Laurel, Gold Rain, Star, Banner and Victory varieties at the Experimental Station, Fredericton. No loose smut was reported.

N.S.- Covered smut was reported in 3 fields in Colchester and Pictou counties; infections ranged from 2.5 to 5%. Loose smut was found in 6 fields, chiefly in Colchester county. Infections ranged from 3 to 15%.

P.E.I.- Loose smut was general in the province on all varieties grown. It caused considerable damage in Queens county. Infections varied from a trace to 15%.

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

Alta.- Halo blight was reported from 26.6% or 36 fields out of 135 examined, principally in zones 9 and 10. The damage was a trace in 29 fields, and light in 7.

Sask.- Halo blight was found in 5 fields out of 36 examined. The damage was slight.

Man.- The damage caused by this disease was a trace in 3 fields out of 78 examined.

N.B.- A trace of halo blight was found on Laurel and Victory at the Experimental Station, Fredericton.

P.E.I.- Only a trace of halo blight was observed at the Experimental Station, Charlottetown.

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

Alta.- Bacterial stripe blight was found in 42.9% or 58 out of 135 fields, 49 of which were in zone 10. The damage was estimated as a trace in 16 fields and as light in 42.

Man.- A trace of this disease was reported in 2 fields out of 50 examined.

FOOT ROTS

Alta.- Foot rot (Fusarium spp.) caused 5% damage in one field, while in all others the damage was a trace.

Sanford (Sc. Agr. 14:50. 1933) has described a serious foot rot of oats, which was widespread in the Edmonton district in 1933. The damage ranged from a trace to severe.

Sask.- Foot rot due to Helminthosporium sativum and Fusarium spp. caused slight damage in 27 out of 30 fields examined.

One field suffered a trace of damage from prematurity blight (cause unknown).

Man.- Foot rot attributed to Helminthosporium and Fusarium spp. was found in 37% or 29 out of 77 fields examined. Infection was as follows: trace, 13 fields; slight, 10; medium, 4; severe, 2.

N.B.- Foot rot (Helminthosporium sp.) caused severe damage in one field in Carleton county and a trace of damage in a small field of Victory at Fredericton.

BROWNING ROOT ROT - Pythium spp.

Man.- Although 25 fields were examined for browning root rot, it was not found.

LEAF BLOTCH - Helminthosporium Avenae Eidam

Man.- A trace of leaf blotch was recorded from one field out of 38 examined.

P.E.I.- Infections of leaf blotch varying from a trace to 10% were reported. It was found throughout the province, on every variety grown.

SPECKLED LEAFBLOTCH - Leptosphaeria avenaria Weber (Septoria Avenae Frank)

Que.- Speckled leaf blotch was first observed at Macdonald College on June 28. The disease increased in prevalence from then until the oats were mature. Infection ranged from a trace to 50%. It was most abundant on Cartier and 3 new varieties, not yet available commercially, Lanark, Robin and Mabel, not only at Macdonald College but also at Lennoxville, and Ste. Anne de la Pocatière. (R.F. Suit)

BLAST - Cause unknown

Alta.- Blast was present in all the 135 fields examined. The average damage was 6% and in 3 fields in zone 9 it was as much as 25%.

Sask.- A trace of blast was reported from one field.

Man.- Blast was observed in 14 fields out of 35 examined; the average damage was slight.

N.B.- A trace of blast occurred in all varieties at the Experimental Station, Fredericton. It was severe in a variety grown at the Seed Laboratory, Sackville.

P.E.I.- Blast was found in all 3 counties of the province; infection ranged from a trace to 15%.

BARLEY

STEM RUST - Puccinia graminis Pers.

B.C.- Stem rust was present on barley, but caused little damage.

Sask.- A trace of stem rust was found at Indian Head on July 17. The rust never became abundant.

Man.- Very little stem rust occurred on barley this year. A trace only was reported in 3 fields out of 22 examined.

Que.- Stem rust was first found on barley at Macdonald College on July 14. Infections ranging up to 40% on some stems were observed.

N.B.- A trace of stem rust was present in a field of Charlottetown 80, at Fredericton on August 4.

P.E.I.- Light infections of stem rust were observed on barley at Charlottetown.

LEAF RUST - Puccinia anomala Rostr.

Man.- A trace only of leaf rust was reported this year. A few pustules were first found on July 7 at Morden.

Que.- Leaf rust was first observed at Macdonald College on July 14. Infections ranged from slight to moderate on various varieties.

N.B.- One per cent of leaf rust was present on a specimen sent from the Fredericton Laboratory to Ottawa.

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

Alta.- Covered smut was reported from 32.6% or 15 out of 46 fields examined. The average damage in the infected fields was 1.9%; the highest damage was 10% in a field in zone 10.

Sask.- Covered smut was found in 3 out of 6 fields examined. The average damage was 1%.

Man.- This smut was present in 3 fields out of 14 examined. The average damage was 1%.

N.B.- A trace of covered smut was reported in Star, Trebi, Gold, Sanalta, Himalayan, Early Chevalier, O.A.C. 21, Manchurian, Velvet, Gordon A, Hannchen, Monck, Glabron, Bearer, Charlottetown 80 and Regal, all the varieties grown in rod-row plots at Fredericton.

P.E.I.- Traces of covered smut were present in the head rows at Charlottetown.

LOOSE SMUT - Ustilago nuda (Jens.) Rostr.

Alta.- Loose smut was reported from 4 fields out of 46 examined. The average damage was 1.2% in the infected fields; the highest damage was 2.0%.

Man.- A trace of loose smut was found in one field out of 14 examined.

Que.- Infections of loose smut varied from a trace to 5% at Macdonald College. It was most prevalent in the breeding plots.

P.E.I. Loose smut infections varied from a trace to 12%. It was observed in all 3 countries of the province.

STRIPE - Helminthosporium gramineum Rabh.

Alta.- Stripe caused light damage in 4 fields out of 46 examined.

Man.- A trace of stripe was found in one field out of 25 examined.

Que.- Stripe was found in several crosses and varieties in the yield plots at Macdonald College. A trace to 5% of the plants were infected.

P.E.I.- Traces of stripe were present on several varieties in Queens county.

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

Alta.- Net blotch was found in 10 fields out of 46 examined. The damage was: trace in 8 fields and light in 2.

Sask.- Net blotch caused slight damage in 2 fields out of 6 examined.

Man.- A trace of net blotch was recorded in 3 out of 25 fields inspected.

N.B.- Leaves of barley affected with net blotch were received at Ottawa from the Fredericton Laboratory.

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

B.C.- Spot blotch slightly infected barley on Vancouver Island.

Alta.- The damage from spot blotch was: trace in 6 fields and light in 5, out of 46 fields examined.

Man.- A trace of spot blotch was reported from 6 fields out of 25 examined.

Que.- Spot blotch was first observed on June 9 at Macdonald College. On July 21, infection ranged from a trace to 40%. The most heavily infected varieties were - Gordon, 40%; Oxford, velvet and O.A.C. 21, 10%. At Lennoxville and Ste. Anne de la Pocatiere, infection ranged from a trace to 10%.

FOOT ROTS

Alta.- Foot rot attributed to Helminthosporium sativum P.K. & B. and Fusarium spp. was reported from 6 fields out of 46 examined; the highest damage was 3%.

Sask.- Helminthosporium-Fusarium foot rot caused slight damage in 5 out of 6 fields inspected.

Man.- Foot rot of the same type was reported in 22 fields out of 35 examined. Infection was as follows: trace in 6 fields, slight in 7, medium in 6, and severe in 3.

N.B.- Foot rot due to Helminthosporium sp. caused severe damage to one field in Carleton county and another in Queens. Traces of foot rot were widespread.

P.E.I.- A Fusarium foot rot infected a trace to 15% of the young plants in some fields in Queens county. Later the plants apparently recovered their normal vigour.

ERGOT - Claviceps purpurea (Fr.) Tul.

Alta.- Ergot was found in 4 fields in zone 10. In one field 3% of the heads bore ergots, in the other a few heads were infected.

Sask.- A trace of ergot was recorded from one field.

Man.- A trace of ergot was found in barley at Winnipeg.

N.B.- A trace of ergot was observed in Charlottetown 80, at Fredericton.

P.E.I.- Traces only of ergot were present in the barley head rows at Charlottetown.

SCALD - Rhynchosporium Secalis (Oud.) Davis

Alta.- Scald caused slight damage in 2 fields out of 46 examined.

POWDERY MILDEW - Erysiphe graminis DC.

Man.- A single collection of powdery mildew was made on barley in October.

P.E.I.- Traces of powdery mildew were reported on O.A.C. 21 in Queens county.

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

Man.- A trace of bacterial blight was reported from 12 out of 30 fields examined.

Que.- Bacterial blight moderately infected several varieties of barley at Macdonald College. It was heaviest on Pontiac, of which 40% of the leaves were infected.

FALSE STRIPE - ?Heterosporium Avenae Oud.

Man.- False stripe caused slight damage to 5 out of 22 fields inspected.

RYE

STEM RUST - Puccinia graminis Pers.

Man.- Stem rust was first found on rye on June 30. Later a trace was present on rye in several localities. No damage was caused.

Que.- Infections ranging from 5 to 85% were present on fall rye on June 29 at Macdonald College.

LEAF RUST - Puccinia dispersa Erikss.

Alta.- Rye was moderately infected with leaf rust in one field out of 5 examined.

Sask.- Leaf rust was fairly common in southweastern Saskatchewan by July 20.

Man.- Leaf rust was first reported on rye on July 6. It was found throughout the province, but it was not sufficiently abundant to cause any damage.

Que.- A trace of 15% of leaf rust was found on fall rye at Macdonald College.

ERGOT - Claviceps purpurea (Fr.) Tul.

From the records of the Western Grain Inspection Division it was found that from Aug. 1, 1931 to July 31, 1932, 34 cars of

rye graded "ergoty" out of 1,929 cars inspected. In addition, 815 others contained ergot. Again from August 1, 1932 to Jan. 31, 1933, 8 cars graded "ergoty", 390 others contained ergot, out of 625 cars inspected. Dr. J. H. Craigie kindly supplied these data.

Alta.- Ergot was found in 3 fields out of 5 examined. In one field near Edmonton, 50% of the heads were infected, in the other two, a trace was present.

Sask.- Three per cent of the heads were infected with ergot in one field out of 2 examined.

POWDERY MILDEW - Erysiphe graminis DC.

Que.- Powdery mildew slightly to moderately infected fall rye at Macdonald College, but caused no noticeable damage.

FOOT ROTS

Alta.- Foot rot attributed to Helminthosporium sativum and Fusarium spp. caused a trace of damage in one field.

Sask.- Slight damage was caused by Helminthosporium-Fusarium foot rot in one field.

Man.- A trace of damage was caused by foot rot due to Helminthosporium and Fusarium spp. in 4 out of 14 fields examined.

II. DISEASES OF FORAGE AND FIBRE CROPS

ALFALFA

COMMON LEAF SPOT - Pseudopeziza Medicaginis (Lib.) Sacc.

B.C.- Common leaf spot was general on Grimm on Vancouver island, but it caused slight damage. It was also observed at Salmon Arm.

Alta.- The disease lightly to moderately infected 5 fields out of 10 examined, but in an experimental plot at Edmonton, all the leaves were infected. The average damage was slight.

Que.- Common leaf spot slightly to severely infected the different varieties grown at Macdonald College. It caused some defoliation.

N.B.- This leaf spot was common in Westmoreland, Queens, Sunbury, York and Carleton counties. The damage was slight.

P.E.I.- Grimm alfalfa was moderately infected with common leaf spot. The disease is very common throughout the province.

DOWNY MILDEW - Peronospora aestivalis Syd.
(P. Trifoliorum de Bary p.p.)

Alta.- Lytton was heavily infected and severely damaged by downy mildew at Lacombe and Edmonton, while other varieties of alfalfa were free or bore only traces of mildew.

Downy mildew was also observed by Dr. L. E. Kirk on Lytton alfalfa at the above places, and at Lethbridge, Alta.; Indian Head, Sask.; Brandon, Man.; Kapuskasing and Ottawa, Ont.; and Macdonald College, Que. Moreover, a sample of this strain of alfalfa grown at Lytton, B.C. in 1932 was examined for oospores. A small quantity of seed was shaken up in water, the washings centrifuged and the deposit examined microscopically. It was found that oospores of Peronospora aestivalis were present floating singly in the mounting medium. In addition, one fragment of plant tissue containing 5 spores in situ was observed. (I. L. Conners)

CROWN ROT - Sclerotinia sp.

Alta.- Alfalfa was lightly to moderately damaged by this rot in the experimental plots at Edmonton and Lacombe in the early spring.

BROWN ROOT ROT - Plenodomus Meliloti Dearn. & Sanf.

Alta.- Severe damage by brown root rot was observed in the early spring in several fields at Athabasca and in the experimental plots at Edmonton and Lacombe.

LEAF SPOT and STEM CANKER - Stagonospora Meliloti (Lasch) Petr,
(=Ascochyta Medicaginis Bres.)

Alta.- Leaf and stem canker was observed in practically

every field examined and in the experimental plots, Edmonton. The damage was a trace.

YELLOW LEAF BLOTCH - Pseudopeziza Jonesii Nannf.

An unfortunate typographical error was made last year. The organism causing this disease was called by Nannfeldt Pseudopeziza Jonesii, not Pseudomonas Jonesii as reported in the Survey (Can. Pl. Dis. Survey 12:24)

COMMON CLOVER

COMMON LEAF SPOT - Pseudopeziza Trifolii (Biv.-Bern.) Fuck.

P.E.I.- This leaf spot was reported to be common and moderately destructive to red clover in Prince Edward Island.

MOSAIC - Virus

B.C.- Mosaic was reported from Salmon Arm on white clover.

Que.- Ninety per cent of the clover plants were infected with mosaic in the Agronomy plots at Macdonald College. Mosaic was also common in clover grown for hay. Some damage was caused due to the reduced growth of affected plats. (R. F. Suit)

P.E.I.- Traces of mosaic were observed in red clover in pastures.

POWDERY MILDEW - Erysiphe Polygoni DC.

B.C.- Powdery mildew was common on red clover on Vancouver island and in the Fraser valley, but it caused little damage. It is also fairly prevalent at Summerland.

Que.- Powdery mildew was first observed on red clover on June 24. The plants were slightly to moderately infected, but were apparently not injured.

N.B.- This disease was common throughout the province; the damage was slight.

P.E.I.- Red clover was slightly to heavily infected with powdery mildew in all 3 counties; the damage was slight to very severe.

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

Man.- Aecia of this rust were found on alsike at Winnipeg and on white clover at Winnipeg and Lac du Bonnet. The infection was slight.

Ont.- A very heavy infection of rust was observed on the aftermath in a field of red clover near Bradford.

N.B.- Rust was common on red clover in York, Sunbury, Queens and Westmoreland counties.

P.E.I.- Rust was present on both red and white clover in Queens county. The damage was negligible.

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

P.E.I.- Traces of sooty blotch were found at the Experimental Station, Charlottetown.

ANTHRACNOSE - Kabatiella caulivora (Kirchn.) Karak. (=Gloeosporium caulivorum Kirchn.)

Alta.- Anthracnose caused slight damage in the field of Altaswede red clover at Spruce Grove, from which it was reported in 1932.

BROWN ROOT ROT - Plenodomus Meliloti Dearn. & Sanf.

Alta.- Severe damage by brown root rot was observed in the early spring in stands of Altaswede red clover at Athabasca.

SWEET CLOVER

MOSAIC - Virus

B.C.- Mosaic was reported on sweet clover from Summerland.

CROWN ROT - Sclerotinia sp.

Alta.- Sweet clover was moderately to severely damaged by crown rot in fields at Athabasca and Lacombe.

BROWN ROOT ROT - Plenodomus Meliloti Dearn. & Sanf.

Alta.- Brown root rot caused moderate to severe damage to sweet clover in the early spring in fields at Athabasca and in the experimental plots at Lacombe and Edmonton.

LEAF SPOT and STEM CANKER - Stagonospora Meliloti (Lasch) Petr.

Alta.- A trace of stem canker was observed in 4 out of 9 fields examined.

Sask.- This leaf spot was found in 2 fields out of 3 examined. Damage was a trace.

Man.- This disease was general throughout Manitoba.

CORN

BACTERIAL STALK ROT - Bacterium dissolvens Rosen

Alta.- Bacterial stalk rot caused slight damage to corn at Olds and Edmonton.

SMUT - Ustilago Zeae (Beckm.) Ung.

Alta.- A specimen of corn affected with smut was received from Brooks. Damage was a trace.

Man.- A slight infection of corn smut was reported from Winnipeg.

N.B.- A trace of smut was found in a small field at Fredericton.

FLAX

RUST - Melampsora Lini (Ehrenb.) Desm.
Man.- A trace of rust was found in most fields of flax. Twenty-five per cent of the plants were infected in one, south of Brandon.

WILT - Fusarium Lini Bolley
Man.- A slight infection of flax wilt was observed at Morris and a trace at Morden.

SUNFLOWER

WILT - Sclerotinia Sclerotiorum (Lib.) de Bary
Alta.- Wilt caused moderate damage to sunflowers in patches in a field in zone 10.
Sask.- Sunflowers were slightly infected with wilt in a garden at Saskatoon.
Man.- Wilt caused slight damage in a field at Morris.

MANGEL

BLACK LEG - Phoma Betae (Oud.) Frank
B.C.- Black leg caused heavy losses in storage especially during the spring months. Long Red appeared to be the least susceptible variety. In the field several plants bore leaf infections and only a few of the roots showed disease symptoms at harvesting.

SUGAR BEET

CROWN GALL - Pseudomonas tumefaciens (E.F.Sm.& Towns.) Dugg.
Alta.- A root bearing a well developed gall, probably crown gall, was observed at Edmonton.

SOYBEAN

MOSAIC - Virus
B.C.- Soybeans, which were grown from seed obtained from the Central Experimental Farm, Ottawa, were affected 100% with mosaic at Summerland. The disease was spreading to a healthy strain from locally grown seed.

N.B.- One per cent of the plants were affected with mosaic at the Experimental Station, Fredericton.

BACTERIAL BLIGHT - Pseudomonas glycinea Coerp.

Ont.- Bacterial blight seriously damaged soybeans near Woodham. The organism was isolated and identified as Phytomonas Sojae. (D. H. Jones)

BROOM CORN

COVERED KERNEL SMUT - Sphacelotheca Sorghi (Lk.) Clinton

Ont.- Fifteen to 20% of the plants were affected in an acre field in Lincoln county. The seed had not been treated. This smut was also prevalent at Forest, Ont.

CULTIVATED GRASSES

BROOM MILLET (Panicum mileaceum)

Smut (Sorosporium Panici-mileacei (Pers.) Takah.) was destructive in 3 plots at Indian Head and in one field in zone 7 in Saskatchewan. The average damage was 25%.

KENTUCKY BLUE GRASS (Poa pratensis)

Leaf spot (Scolecotrichum graminis Fuck.) was fairly general on the experimental plots, Saanichton, B.C. It caused some premature defoliation.

Smut (Ustilago striaeformis (West.) Niessl). A small amount of this smut was found for the first time at M.A.C., Winnipeg, Man., on the above host. (G. R. Bisby)

PERENNIAL RYE GRASS (Lolium perenne)

Leaf spot (Ovularia sp.) was common on a New Zealand variety of this grass in the experimental plots, Saanichton, B.C., and introduced via the Central Experimental Farm, Ottawa. The affected leavesdie prematurely, reducing considerably the pasturage value. It was not observed on local varieties. (W. Jones)

RED TOP (Agrostis alba)

Stem rust (Puccinia graminis Pers. var. Agrostidis Erikss. & Henn.) Traces of stem rust were found in Queens county, PE.I.

TIMOTHY (Phleum pratense)

Stem rust (Puccinia graminis Pers. var. Phlei-pratensis (Erikss. & Henn.) Stakm. & Piem.). Individual selected timothy plants growing in the University plots, Edmonton, Alta., were heavily attacked, while others in the vicinity were free from rust.

Stem rust was common on timothy at Berens River, Man., in

July. It evidently overwinters there. (G.R. Bisby).

Stem rust was first observed on July 27 at Macdonald College, Que. By Oct. 1, the leaves and stems were moderately to severely infected, causing some reduction in vigour.

This rust was common on timothy in fields at the Experimental Station, Fredericton, N.B. The damage was slight.

Stem rust may be found on a number of cultivated strains at the Experimental Station, Charlottetown, P.E.I., and also on wild plants. It causes slight damage.

Ergot (Claviceps purpurea (Fr.) Tul.) moderately infected timothy in a field near Red Deer, Alta.

Smut (Ustilago striaeformis (West.) Niessl) was found for the first time on timothy in Manitoba at Seddon's Corners near Beausejour and at Winnipeg. The disease was not serious.

Floret Sterility (Cladosporium herbarum Lk.). Timothy plants so affected were collected by Dr. W.C. Broadfoot in Alberta and the associated fungus was determined by Dr. G.R. Bisby. It appeared to be parasitic.

WESTERN RYE GRASS (Agropyron tenerum)

Smut (Ustilago bromivora (Tul.) Fisch. v. Waldh.) lightly infected this grass in the experimental plots at Lacombe, Alta.

This smut has been transferred experimentally to Agropyron Griffithsii, A. dasystachyum and A. Richardsoni by Dr. A.W. Henry, Edmonton, Alta., who has deposited affected specimens in the herbarium at Ottawa. (I.L. Conners)

It was also collected for the first time on western rye grass at Nappan, N.S. This is the first report of this smut on A. tenerum from other than the Prairie provinces. (I.L. Conners)

Ergot (Claviceps purpurea (Fr.) Tul.) frequently but lightly infected one field in zone 10 in Alberta.

Leaf spot (Septoria Agropyri E. & E.) heavily infected one field in zone 10 in Alberta.

Scolecotrichose (Scolecotrichum graminis Fuck.) moderately infected this grass in the University plots, Edmonton, Alta.

TURF

Snow mould (Fusarium etc.). Many inquiries about snow mould on golf and bowling green etc. have been received at M.A.C., Winnipeg, Man., probably on account of an awakened interest. (G. R. Bisby)

Brown patch (Rhizoctoni Solani Kühn) was destructive to a turf of Poa annua at St. Catharines, Ont.

Brown patch of the "dollar spot" type caused some damage

to the greens of the Saskatoon Bowling Club, Saskatoon, Sask., in May. Both Rhizoctonia and Pythium appeared to be present.

Browning root rot (Pythium sp.) caused serious damage to a lawn of crested wheat grass (A. cristatum) at Winnipeg. The disease appeared in patches, which gradually increased in size.

Crested wheat grass, quack grass, green foxtail, wild barley, common darnel, wild oats, timothy, western rye grass and brome grass were grown in field soil naturally infected with various Pythium species. On every grass lesions containing typical oospores of Pythium developed in the roots. Isolations of various species from each host have been made. (T. C. Vanterpool)

III. DISEASES OF VEGETABLE AND FIELD CROPS

ASPARAGUS

RUST - Puccinia Asparagi DC.

Sask.- Asparagus was moderately infected by rust in the telial stage in the University gardens, Saskatoon, on Sept. 5.

Ont.- Twenty per cent of the plants of Martha Washington, a resistant variety, were rusted in a plantation in Lincoln county.

N.B.- Asparagus was slightly infected with rust at the Experimental Station, Fredericton.

CROWN ROT - Fusarium bulbigenum Cke. & Mass.

Sask.- A Fusarium was isolated from plants affected with crown rot in the University gardens, Saskatoon in August. The culture was identified as F. bulbigenum by Dr. W. L. Gordon (T.C. Vanterpool). A similar report was received last year under the name "basal stem root".

BEAN

RUST - Uromyces appendiculatus (Pers.) Lév.

N.B.- Rust caused severe damage to a variety of pole beans in a garden in Fredericton. A specimen was also received from Rothesay.

P.E.I.- A trace of rust was present in a garden in Queens county.

MOSAIC - Virus

B.C.- At least 50% of the bean plants were affected with mosaic at the Experimental Station, Summerland.

Alta.- Mosaic was observed in some Edmonton gardens.

Que.- Mosaic affected a trace to 6% of the plants at Macdonald College, the amount varying with the variety.

N.B. Mosaic is common in gardens in York county. On Golden Wax in a Fredericton garden, 5% of the plants were affected.

P.E.I.- One per cent of the plants were affected with mosaic in the several varieties grown at the Experimental Station, Charlottetown, while infections ranged from 0.1% to 0.5% in local gardens.

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

Que.- Anthracnose severly infected 50% of the plants of Golden Wax and Wardwell Kidney Wax among the several varieties of beans grown at Macdonald College.

N.B.- Anthracnose was severe in two gardens in Fredericton.

N.S.- A trace of anthracnose was reported in 3 acres of Pencilled Pod and Black Wax beans at North Kingston.

P.E.I.- Anthracnose slightly to severely affected bean varieties in the experimental plots, Charlottetown.

BACTERIAL BLIGHT - Pseudomonas Phaseoli E.F.Sm.

B.C.- Bacterial blight was fairly general on beans on Vancouver island, and caused a loss of about 20% of the crop in low lying areas.

Alta.- Bacterial blight caused severe damage in a few Edmonton gardens and light to moderate damage from this disease was common throughout the province.

Que.- Bacterial blight was first observed at Macdonald College on June 29. The amount of infection varied from a trace to 90% according to the variety. Scotia was the most resistant again this year, while 3 varieties were severely infected (90%).

N.B.- Bacterial blight caused slight damage in one garden in York county and in the experimental plots of the Seed Testing Laboratory, Sackville.

WILT - Sclerotinia Sclerotiorum (Lib.) de Bary

N.B.- Wilt caused severe damage to beans in a private garden at the Experimental Station, Fredericton.

N.S.- A trace of wilt was present in a field of beans at North Kingston on July 21.

BEET

SCAB - Actinomyces Scabies (Thaxt.) Güssow

N.B.- Scab affected 2% of the beets in a garden in York county.

LEAF SPOT - Cercospora beticola Sacc.

Que.- Garden beets were moderately infected with leaf spot at Macdonald College.

N.B.- Leaf spot was common in the province. It caused slight damage in a small garden in York county.

P.E.I.- Leaf spot infection varied from a trace to heavy in local gardens in Queens county. The damage was slight.

SEEDLING BLIGHT - Fusarium sp.

Que.- Before the beets were thinned, 10% of the seedlings were killed by blight. No loss occurred in the mature crop.

CABBAGE

CLUB ROOT - Plasmodiophora Brassicae Woron.

B.C.- Club root was destructive in several fields in the Victoria and Vancouver districts.

Que.- Club root caused heavy losses in some fields of cabbage in Laval county.

N.B.- Three hundred plants were all infected and destroyed by club root on one farm in Sunbury county.

P.E.I.- Club root severely affected 2% of the Danish Ballhead plants in a commercial garden at Charlottetown and 1% in a garden at Brackley Beach.

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

Ont.- Black rot was present in the field in Waterloo county in 1932 and to some extent in the pits in January 1933. The damage was slight.

Que.- Black rot was unusually destructive at Macdonald College on turnip, swede, cauliflower and cabbage. It was estimated that 85% of the Danish Ballhead cabbage was infected and that the loss was 20%.

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

Man.- Wire stem caused some injury to cabbage at Winnipeg.

LEAF SPOT - Alternaria circinans (Berk. & Curt.) Bolle (=A. Brassicae Sacc.)

B.C.- Leaf spot was observed on a few plants on Vancouver island.

CARROT

YELLOWS - Virus

N.B.- Yellows severely damageed 90% of the carrots in a field in Sunbury county; a trace was found in a garden in Fredericton.

CAULIFLOWER

CLUB ROOT - Plasmodiophora Brassicae Woron.

B.C.- Club root was destructive in several fields about Victoria and Vancouver.

Ont.- About 50% of the plants were moderately infected with club root in a field in the Humber Bay district, but it did not seriously reduce the crop.

Que.- In Laval county club root affected from 5 to 20% of the plants in several fields and it caused considerable damage in some. The disease is becoming more and more prevalent.

N.B.- Club root caused severe damage in one garden in York county.

P.E.I.- Two per cent of plants were destroyed in a commercial garden in Charlottetown.

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

Que.- Black rot infected 95% of the Early Snowball cauliflower at Macdonald College and caused 70% damage.

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

Sask.- Four plants were killed by wire stem at Saskatoon. Rhizoctonia was isolated.

CELERY

LATE BLIGHT - Septoria Apii Chester

Alta.- Celery was infected 100% by late blight in one Edmonton nursery and the disease was common and frequently severe in gardens.

Man.- Late blight moderately damaged celery at Brookside.

Ont.- In Lincoln county late blight is caused by both S. Apii and S. Apii var. graveolentis Dorogin. The former pathogen, although not as prevalent as the latter, nevertheless caused considerable damage. Several fields were observed, where only the "large spot" pathogen was found. Late blight, caused by S. Apii graveolentis was somewhat less prevalent than in previous years and did not appear until about July 15.

Que.- Moderate infections of late blight were seen in a few fields in Laval county.

N.B.- Late blight caused slight damage in one garden in Sunbury county.

P.E.I.- Late blight was very destructive this year on all varieties grown in Queens county.

YELLOWS - Fusarium sp.

B.C.- Yellows affected less than 1% of the plants in fields at Armstrong. The disease appeared sporadically in different parts of the field.

STUNT - ?Virus

Alta.- Celery was moderately to severely damaged in Edmonton gardens by a disease characterized by a stunting and yellowing of the plants. Attempts to isolate a parasitic organism failed.

BLACK HEART - Physiological

Ont.- In Lincoln county black heart was considerably more destructive than it has been for several years. The disease developed principally during the first week in August, after a rain following a prolonged dry period. It was observed chiefly on Golden Plume and Paris Golden.

P.E.I.- Black heart moderately affected celery in some commercial gardens in Queens county.

SOFT ROT - Bacillus carotovorus L.R. Jones
Ont.- Soft rot was destructive in January to celery in cold storage at Guelph. The plants were grown at Thetford.
In the field it caused no appreciable damage in Lincoln county in 1933.

DROP - Sclerotinia Sclerotiorum (Lib.) de Bary
Ont.- A single specimen affected with drop was seen in the experimental plots at the Laboratory farm, St. Catharines.

CUCUMBER

SCAB - Cladosporium cucumerinum Ell. & Arth.
N.B.- Scab was widespread and caused severe damage in Sunbury and Queens counties.
P.E.I.- It caused severe damage to cucumbers in some gardens at Charlottetown.

POWDERY MILDEW - Erysiphe Cichoracearum DC.
N.B.- Powdery mildew was present on cucumbers in a garden in Fredericton.

ROOT KNOT - Caconema radicicola (Greef) Cobb
Ont.- In a greenhouse in Welland 30% of the plants were affected with root knot in a small planting.

EGG PLANT

PHOMOPSIS BLIGHT - Phomopsis vexans (Sacc. & Syd.) Harter
Ont.- This disease was present on all varieties observed in Lincoln county, but it was not as prevalent as in previous years.

VERTICILLIUM WILT - Verticillium Dahliae Kleb.
Ont.- Verticillium wilt was common again this year in Lincoln county. It was found on the following varieties: New York Purple, Florida Highbush, Black Beauty, Early Dwarf, Blackie and Black Nagasakia. The damage varied from slight to 75% of the plants.

DRY FRUIT ROT - Alternaria sp.
Ont.- A dry fruit rot was observed in Lincoln county on the Florida Highbush, New York Purple and Blackie varieties. Not only were large external lesions formed, but also the internal tissue was invaded extensively. A species of Alternaria isolated from the internal tissue produced similar lesions when it was used to artificially inoculate healthy fruits and the organism

was re-isolated. Although the disease was observed on the fruits several times, the foliage was free of any Alternaria leaf spot. (J.K. Richardson).

SOFT ROT - Botrytis sp.
Ont.- A single specimen affected with soft rot was found in the Laboratory plots, St. Catharines.

EARLY BLIGHT - Alternaria Solani (Ell. & Martin) Jones & Grout.
N.S.- Early blight caused 5% damage to seedling egg plants at the Experimental Station, Kentville.

HOP

DOWNY MILDEW - Pseudoperonospora Humuli (Miyabe & Tak.) Wilson
B.C.- Basal spike infection by downy mildew was general on Cluster and Golding varieties in the spring in the Fraser River valley, although the disease was less prevalent than in previous years. It was kept in control by dusting the crowns with Bordeaux and by spraying with 1% Bordeaux. There was hardly any cone infection on account of a period of dry weather.
Field observations indicate that Golding, hitherto fairly resistant, is being attacked more heavily. Some plants of the Fuggles variety were slightly infected. (W. Jones)

CHLOROSIS - Virus
B.C.- Although several Golding plants were definitely chlorotic, the symptoms were not as pronounced as in 1932. Chlorosis was also observed in Fuggles, while in Clusters it may be present, but the symptoms were indefinite.

LETTUCE

DROP - Sclerotinia Sclerotiorum (Lib.) de Bary
Alta.- Severe damage was caused by lettuce drop in many Edmonton gardens and at the Experimental Station, Lacombe.

TIP BURN - Non-parasitic
B.C.- Tip burn was present in all districts in the Okanagan valley. It is the limiting factor in the production of lettuce.

RUST - Puccinia patruelis Arth.
Man.- Several varieties bore aecia of the rust at Brandon.

RING SPOT - Marssonina Panattoniana (Berl.) Magn.
B.C.- Ring spot was found in one field near Voctoria. The damage was moderate, being rather severe in patches.

Ont.- Ring spot caused severe damage to leaf lettuce on a farm near Port Dalhousie.

MARGINAL LEAF SPOT - Pseudomonas marginalis (Brown) Stev.
(Phytomonas marginalis (Brown) Bergey et al.

Ont.- Marginal leaf spot caused severe damage at Ancaster. Two heads received at Guelph showed typical symptoms of the disease and pure cultures of the organism were obtained (D. H. Jones). This is the first report of this disease to the Survey.

BOTTOM ROT - Rhizoctonia Solani Kühn

Que.- One third of a crop of Big Boston was severely damaged by bottom rot in a planting in Jacques Cartier county. The lettuce was on a muck soil, which had not previously grown lettuce or other vegetable crops. The organism was isolated.(J. G. Coulson)

ROOT KNOT - Caconema radicicola (Greef) Cobb

B.C.- Root knot caused considerable damage to ½ acre of lettuce in a field near Victoria.

ONION

NECK ROT - Botrytis Allii Munn

B.C.- Neck rot was much more prevalent than usual in the Kelowna district and caused a loss of thousands of tons of onions. The weather was wet and rainy over a considerable period at a time when harvesting of the crop should have been taking place.

N.S.- A trace of neck rot was found at Kentville.

SMUT - Urocystis Cepulae Frost

Ont.- Thirty to 40% of the plants of Danvers Yellow Globe were infected with smut in a field in Lincoln county on May 29. The seedlings were about 3 inches high. No attempt had been made to control the disease.

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

DOWNY MILDEW - Peronospora Schleidenii Unger

B.C.- Onions were infected approximately 90% by downy mildew in a few fields in the Delta region, Fraser River valley. The disease was general in other areas and caused moderate damage.

BULB ROT - Fusarium oxysporum Schl. (=F. Cepae Hanz.)

B.C.- Bulb rot was in general more extensive in the Kelowna area than it has been and caused a loss of about 5% of the whole crop. Cultures of the organism were identified by Dr. W.L. Gordon.

SOFT ROT - Bacillus carotovorus L.R. Jones
Que.- The crop of Yellow Globe Danvers and Red Globe was almost a total loss at Macdonald College on account of soft rot.

PEA

POWDERY MILDEW - Erysiphe Polygoni DC.
B.C.- Powdery mildew was general on Vancouver island and the lower mainland; the damage was slight.
N.B.- Powdery mildew was common in Westmorland, Queens, York and Sunbury counties.

DOWNY MILDEW - Peronospora Viciae (Berk.) deBary
B.C.- Downy mildew was general in the Fraser valley and on Vancouver island. It caused moderate defoliation; the disease was heaviest where the crop was partially lodged.
Alta.- Downy mildew was severe on several varieties at Brooks.

LEAF and POD SPOT - Ascochyta Pisi Lib.
Alta.- This disease caused severe damage in several Edmonton gardens.
Que.- Leaf and pod spot was first observed on June 2 at Macdonald College. Pod infection varied from 3-5 per cent on July 15. In the Quebec Seed Board plots the Arthur variety was the most severely infected.
N.B.- A trace of the disease was present in the Seed Laboratory plots, Sackville.
N.S.- Leaf and pod spot caused slight damage in a garden at Kentville.

RUST - Uromyces Fabae (Pers.) de Bary
Que.- The varieties of peas were moderately infected at Macdonald College. It was not as prevalent as last year.

WILT - Fusarium sp.
Man.- A trace of wilt was found on peas at Morden.

PEPPER

ROT - Alternaria sp.
Ont.- Rot caused considerable damage to pepper in Lincoln county, the loss of fruit varying from a trace to 15%. Alternaria was constantly associated with the lesions, and positive results have been obtained from needle prick inoculations with the organism. (J.K. Richardson)

SCLEROTIUM DISEASE - Sclerotium bataticola Taub.

Ont.- Two fruits affected with this disease were found on a farm in Lincoln county.

POTATO

The following summary of the prevalence of disease in fields inspected for certification in Canada was supplied by Mr. John Tucker, Chief Potato Inspector. Fields for certification were grown from certified seed. Of the fields inspected, 1,931 or 24.1% failed to pass inspection on account of disease, etc. The presence of mosaic in excess of the amounts permitted by the regulations is the chief cause of rejection; over half or 55.8% of the rejections were on account of mosaic. The percentage of rejections on account of other diseases were as follows: black leg, 3.9%; leaf roll, 5.7%; and adjacent in diseased fields, 11.9%.

LATE BLIGHT - Phytophthora infestans (Mont.) de Bary

B.C.- Late blight was fairly general in the Chilliwack and Agassiz districts of the Fraser valley during August. Dry weather checked subsequent spread of the disease.

Que.- Thirty-five fields were rejected on account of late blight out of 1,616 inspected for certification.

N.B.- Late blight developed later than usual and caused moderate damage in York, Carleton (lower part), Madawaska, Westmoreland, Kent, Gloucester and Restigouche counties, and severe damage in the counties of Victoria and the upper part of Carleton. Dry weather prevented much tuber infection, especially in York county. It was reported on Irish Cobbler, Green Mountain and Bliss Triumph.

N.S.- Late blight caused practically no damage in well sprayed fields on Colchester county, but where the fields were not sprayed the damage was occasionally severe as the following records show: Early Rose unsprayed, infection severe, 50% of the tubers rotted; Irish Cobbler in the same field 3% of rot; Irish Cobbler, well sprayed, 75% of the fields free, highest loss 0.5%; Garnet Chili, unsprayed, 4% of rot; well sprayed, not over 0.5% of rot.

P.E.I.- Late blight caused slight to very severe damage in every county. All varieties were affected this year except certain resistant strains, only grown in an experimental way. This was one of the worst blight years on record.

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

Ont.- Rhizoctonia caused considerable damage to a 40 acre field of Dooley and Irish Cobbler in Kent county. The soil was a black muck.

N.B.- Rhizoctonia infected potatoes severely in Carleton, Madawaska and Victoria counties, moderately in Restigouche and Westmoreland, and slightly in Gloucester, York and Sunbury. Of 544 bins examined, 6.6% of the tubers bore rhizoctonia sclerotia.

N.S.- Rhizoctonia was less prevalent this year than usual. Instead of 6 to 8% of the tubers being infected, the average infection was not more than 3% in Colchester, Cumberland, Pictou and Halifax counties.

P.E.I.- Rhizoctonia infection ranged from a trace to 100%. All varieties were infected, Irish Cobbler being the worst.

COMMON SCAB - Actinomyces scabies (Thaxt.) Güssow

B.C.- Common scab was general, but the damage was only slight.

N.B.- Scab was severe in Carleton, Gloucester and Westmoreland counties; moderate in Madawaska, Restigouche, Victoria and Sunbury; and slight in York. Of 544 bins examined, 4.2% of the tubers were infected.

N.S.- An average of 3% of the tubers were affected by scab in Colchester, Cumberland and Pictou counties; the percentage was somewhat higher in Kings. In a field of Irish Cobbler in Colchester county 75% of the tubers were severely affected.

P.E.I.- Common scab caused slight to severe damage in all 3 counties. It was observed on Irish Cobbler, Green Mountain, Bliss Triumph, Spaulding Rose, McCormacks Peachblow, McCullough, Scotch Rock and Snowflake.

BLACK LEG - Bacillus phytophthorus Appel

B.C.- Black leg was found in the Duncan and Comox districts. The highest infections were on Columbia Russett and Epicure. Out of 253 fields inspected, 19 were not certified on account of black leg.

Alta.- Out of 214 fields inspected for certification 9 were rejected on account of black leg.

Sask.- Black leg was the cause of rejection in 4 fields out of 146 inspected for certification.

Man.- Two fields out of 70 inspected were rejected on account of black leg.

Ont.-Sixteen fields out of 525 inspected were rejected on account of black leg.

Que.- Black leg was the cause of rejection in 22 fields out of 1,616 inspected.

N.B.- Black leg was more prevalent in Irish Cobbler than in either Green Mountain or Bliss Triumph. The average infection was 0.02% in 876 fields examined.

N.S.- One per cent of the plants were affected with black leg in a field of Irish Cobbler in Colchester county. It was otherwise scarce in this county, practically absent in Kings and present to a very slight extent in Cumberland.

P.E.I.- The following black leg infections were reported:

Green Mountain, 1%; Irish Cobbler, 0.5%; Bliss Triumph, and Peachblow, 0.1%.

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

B.C.- Early blight was fairly general in all potato growing districts. The damage was slight.

Alta.- Early blight heavily infected one field.

Que.- Early blight infected early varieties severely and late ones, moderately, at Macdonald College.

N.B.- Early blight caused severe infection in York, Sunbury, Carleton, Westmoreland, Gloucester, Victoria, Madawaska and Restigouche counties.

N.S.- In general, the average infection of early blight was slight to moderate. It was severe in the "Valley" district of Kings county, but owing to drought, damage due to early blight alone was difficult to estimate. In one field in Colchester county, infection was severe and the yield was reduced 50% on account of early blight and drought. In the same county, 1% of the tubers of Irish Cobbler were affected with Alternaria rot.

P.E.I.- Early blight caused slight to severe damage. It was observed on Green Mountain, Irish Cobbler, Early Rose, Spaulding Rose, Bliss Triumph and on many of the seedlings being grown at Charlottetown.

LEAF ROLL - Virus

B.C.- Leaf roll was reported from Summerland. Out of 253 fields inspected for certification in British Columbia, 3 were rejected on account of leaf roll.

Alta.- Leaf rollwas the cause of rejection of 3 fields out of 214 inspected.

Sask.- Only traces of leaf roll were reported.

Man.- Leaf roll with mosaic caused the rejection of 3 fields out of 70 inspected.

Ont.- Four fields were rejected on account of leaf roll out of 525 inspected for certification.

Que.- Leaf roll was the cause of 15.9% of the total rejections or 76 fields out of 1,616 fields inspected.

N.B.- Leaf roll was reported on Green Mountain, Irish Cobbler and Bliss Triumph. Out of 876 fields examined for certification, leaf roll was the cause of 3.3% of the rejections.

N.S.-Leaf roll was found in several counties. The heaviest infection was in Kings county in a field of Bliss Triumph, where 40% of the plants were affected.

P.E.I.- Leaf roll caused slight to severe damage throughout the province. The following range of leaf roll infections were reported: Irish Cobbler, trace to 50%; Green Mountain, trace to 15%; Bliss Triumph, trace to 28%; Spaulding Rose, trace to 5%.

MOSAIC - Virus

B.C.- Mosaic rather severely infected potatoes on Vancouver

island. Out of 253 fields inspected for certification in British Columbia, 28 were rejected on account of the disease. The highest infections were reported in Columbia Russett and Green Mountain, the lowest in Up-to-Date.

Alta.- Only one field out of 214 inspected was rejected on account of mosaic.

Sask.- Only traces of mosaic were recorded.

Man.- Mosaic alone or with leaf roll caused the rejection of 5 fields out of 70 inspected.

Ont.- Only 4 fields out of 525 inspected were rejected on account of mosaic. It may be noted that three-quarters of the acreage is planted to Rural New Yorker, which apparently remains comparatively free of mosaic under Ontario conditions.

Que.- Mosaic is the cause of 47.6% of the total rejections, 227 fields failing to pass out of 1,616 inspected.

N.B.- Mosaic was common in all the potato growing sections of the province. In fields inspected for certification, the presence of mosaic was the chief cause for rejection, for of the fields rejected, 80.7% were disqualified on account of mosaic.

N.S.- Mosaic was reported from 6 counties; the highest infection, 29.6%, was found in Kings.

P.E.I.- Mosaic was reported in the following varieties: Green Mountain, trace to 100%; Irish Cobbler, trace to 52%; King Edward, trace to 2%; Blue Victor, trace to 0.5%; Arran Banner, trace to 62%; and Champion, 12%.

WITCHES' BROOM - Virus

B.C.- Witches' broom was reported in Sir Walter Raleigh variety on Vancouver island.

SPINDLE TUBER - Virus

N.B.- A slight amount of spindle tuber was found in all the potato growing sections of the province. Irish Cobbler and Green Mountain were affected.

P.E.I.- Spindle tuber was found in seedlings and Irish Cobbler at the Experimental Station, Charlottetown.

GIANT HILL - Virus

B.C.- Giant Hill was present in all varieties, but it was most severe in Burbank and Netted Gem.

N.B.- This disease was present to a slight extent in all the potato growing sections.

STREAK - Virus

P.E.I.- Streak caused severe damage to seedlings in the experimental greenhouse, Charlottetown.

NET NECROSIS - Cause unknown

P.E.I.- Net necrosis affected 1% of the plants in a field in Queens county.

STEM END HARD ROT - Phomopsis tuberivora Gussow & Foster

B.C.- Only a few tubers were found affected with stem-end hard rot.

DRY ROT - Fusarium spp.

B.C.- About 1% of the tubers in storage were affected with dry rot in May at Saanichton. The disease was common in other areas.

Ont.- Some dry rot was present in a sample of Green Mountains received at the St. Catharines Laboratory.

N.B.- A trace of dry rot was found on the tubers in storage in the fall in several counties.

P.E.I.- Dry rot was reported from storage houses in all three counties in the late winter and spring. It was noted on Irish Cobbler, Green Mountain, King Edward, Bliss Triumph, and Garnet Chili.

WILT - Cause not determined

N.S.- Wilt affected 7% of the plants in a field in Pictou county. This wilt has been under observation for several years. Although roguing has been practiced, it has continued to increase (W.K. McCulloch).

SILVER SCURF - Spondylocladium atrovirens Harz

B.C.- Silver scurf was found on several tubers of different varieties. There was no apparent injury.

N.B.- Traces of silver scurf were found in Carleton, Madawaska, Gloucester, Restigouche and Victoria counties.

P.E.I.- Silver scurf was found on potatoes in storage in April and in the field in September. It was reported from Queens and Prince counties.

POWDERY SCAB - Spongospora subterranea (Wallr.) Lagerh.

B.C.- Powdery scab was found on Early Epicure certified seed potatoes grown at Pitt Meadows in 1932. The grade was "small size". (G.E. Woolliams)

This is the first record of the occurrence of powdery scab in British Columbia.

N.B.- A trace of powdery scab was found in Gloucester, Restigouche and Victoria counties.

P.E.I.- Reports of moderate infections of powdery scab were received from isolated parts of all 3 counties.

PHOMA ROT - Phoma tuberosa Melhus, Rosenb. & Schultz

N.B.- A trace of Phoma rot was found on Green Mountain in Victoria county.

P.E.I.- In April Phoma rot slightly to heavily infected Green Mountain and Irish Cobbler in Queens and Prince counties.

SOFT ROT - Pythium ultimum Trow.

B.C.- Soft rot, which causes the decay of the seed pieces after planting in spring, was found in several fields at Ladysmith and Cobble Hill. In 2 fields there were 50% misses.

GREY MOULD ROT - Botrytis sp. (B. cinerea type)

P.E.I.- In many fields the organism appears to be mildly pathogenic, but occasionally it is very parasitic, especially where the plants are suffering from lack of potash. In a field of Green Mountain in Prince county, 100% of the plants were infected and the damage was heavy.

SKIN SPOT - Oospora pustulans Owen & Wakef.

N.S.- Ten per cent of the tubers were affected with skin spot in British Queen, which was grown in the quarantine plots, Kentville, from tubers from Northern Ireland. (W.K. McCulloch)

FROST INJURY

N.B.- Slight damage was caused by a frost on Aug. 22, in the Saint Quentin district in Madawaska county.

P.E.I.- Frosts in September and October 1933, when the potatoes were still in the field, and low temperatures during transit caused heavy losses.

MAGNESIUM DEFICIENCY - Non-parasitic

N.B.- Severe damage was caused by this condition in a field of Green Mountain in York county; the loss was about 50% of the crop. The trouble has also been reported from Westmoreland, Carleton and Victoria counties.

Where plants are suffering from the lack of magensium they resemble those affected with physiologic tip-burn except the lower leaves are the first to show the symptoms. They also usually fall off. The plant does not die but growth is retarded and the yield of some plants is practically nil.

LENTICEL ENLARGEMENT - Non-parasitic

Sask.- Excessive enlargement of the lenticels was conspicuous about Saskatoon, on tubers dug after the heavy rains in September. The damage was negligible.

PUMPKIN

POWDERY MILDEW - Erysiphe Cichoracearum DC.

N.B.- Powdery mildew was found on pumpkin in a garden in Fredericton.

RHUBARB

CROWN ROT - Cause unknown

Alta.- Crown rot was general about Edmonton. Infection

was heavy and damage severe.

Sask.- Crown rot was strikingly less prevalent in 1933 at Saskatoon than it has been for the last 3 or 4 years. Formerly the general opinion was that the disease was worst during very hot summers. This view hardly seems tenable as the past summer was extremely hot and dry. (T.C. Vanterpool)

LEAF SPOT - Ascochyta Rhei Ell. & Ev. and Phyllosticta straminella Bres.

N.S.- Ascochyta leaf spot caused slight damage at Kentville, while Phyllosticta leaf spot killed some leaves of rhubarb in a garden in Halifax county.

P.E.I.- Ascochyta leaf spot caused moderate damage in Queens county.

RUST - Puccinia Phragmitis (Schum.) Körn.

Man.- The first record of this rust on rhubarb in Manitoba was made at Brandon by Dr. Machacek on June 7. Some varieties were heavily attacked. The rust was rather common; it was even sent in from Inwood as a "serious disease". (G.R. Bisby)

LEAF and PETIOLE SPOT - Cause unknown

Sask.- This trouble was conspicuous on Ruby in two seedling nurseries at the University, Saskatoon. On the petiole the spots were 1 to 2 mm. wide by 2.5 mm. long with light-coloured water-soaked centres and red to purple margins. See also Can. Pl. Dis. Survey 12:51. (T.C. Vanterpool)

SALSIFY

YELLOWS - Virus

N.B.- Two per cent of the plants were affected with yellows in a garden in York county.

WHITE RUST - Cystopus cubicus (Strauss) Lév.

Que.- White rust affected 100% of the plants in a garden in Laval county.

SWEET CORN

BACTERIAL WILT - Bacterium Stewartii (E.F.Sm.) Stev.

Ont.- Bacterial wilt was found in many plantings in Kent, Essex, Norfolk and Lincoln counties. Usually 5 to 50% of the plants were infected; in one field of Golden Bantam in Kent county 50 to 60% of the plants were diseased. Infected plants were a total loss (G.C. Chamberlain)

SMUT - Ustilago Zeae (Beckm.) Unger

Ont.- A specimen of sweet corn affected with smut was received from MacLennan.

Que.- At Macdonald College sweet corn was affected as follows: ear, 1-2%; stalk, 3%; tassel, trace. Field corn showed a trace to slight infection. In the Montreal district smut infections ranged from a trace to 12 and 15%; the damage was considerable. A specimen was also received from Ste. Anne de la Pérade.

N.B.- A trace of corn smut was found in a small field at the Experimental Station, Fredericton.

RUST - Puccinia Sorghi Schw.

Que.- Traces of rust were present on sweet corn in Jacques Cartier county. It was not as prevalent in the fields examined as it was in 1932.

P.E.I.- Traces of rust were present in local gardens in Queens county.

A specimen of Golden Bantam affected with Epicoccum neglectum was collected at Yarmouth, N.S. (K.A. Harrison & I.L. Conners)

TOBACCO

I am indebted to Mr. N. A. MacRae, Tobacco Division, Ottawa, and Mr. G.C. Chamberlain, Dominion Laboratory of Plant Pathology, St. Catharines, Ont., for data here presented.

(1) Seed-Bed

DAMPING OFF - Pythium de Baryanum Hesse

Damage from damping off was reported in a few beds in the Farnham district, Que., but it was not as serious as in 1932. Several cases of damping off in plant beds were reported from Essex and Kent counties, Ontario.

DAMPING OFF - Rhizoctonia Solani Kühn

Damping off found to be caused by Rhizoctonia was encountered in one greenhouse in Norfolk county, Ont. It appeared in 3 areas in the greenhouse and was successfully corrected by drying off the beds and then giving careful attention to watering and ventilation.

In one greenhouse in the Norfolk district young plants were found rotted off at the ground level over an extensive area in the beds. The cause was apparently the high acidity (pH 4.8) of the muck dressing. When slacked lime was applied the acidity was neutralized, the plants put out fresh roots and made a satisfactory recovery.

BLACK ROOT ROT - Thielavia basicola Zopf

About 75% of the beds in the Farnham district, Que., were affected with black root rot. The damage in the majority ranged from 2 to 25%. In beds, however, where the mould was 3 to 4 years old and had been disinfected when the soil was wet, 50 to 80% of the plants were severely affected. The disease was reported to be very prevalent in L'Assomption district in beds, which were not disinfected with formalin, 10 to 100% of the plants being affected. Black root rot was also reported in one bed in the Essex-Kent area, Ontario.

WILDFIRE - Pseudomonas Tabacum (Wolfe & Foster) Stev.

Serious losses were caused by wildfire at the Central Experimental Farm, Ottawa, Ont.

(2) Field

BLACK ROOT ROT - Thielavia basicola Zopf

Black root rot was very prevalent throughout the L'Assomption district, Que. In the Farnham district, lack of heavy and frequent rains prevented serious losses although it was observed a number of times. Similarly black root rot was not observed in Ontario, where it might have been expected, probably because the hot dry season was unfavourable for its development.

WILDFIRE - Pseudomonas Tabacum (Wolfe & Foster) Stev.

Wildfire was reported from several farms in the Farnham district, Que. and a number of plants were affected at the Central Experimental Farm, Ottawa, Ont. Infection was traceable to the seed beds in most cases.

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

In the L'Assomption district, Que., several severe cases were reported. There appears to be differences in varietal resistance. Some of the large pipe types showed less disease than the small pipe types, but more than the cigar types. Angular leaf spot was reported in 6 fields in the Farnham district, infection ranging from 2 to 10%. A section of one field in Essex county, Ont., was moderately affected.

HOLLOW STALK - Bacillus carotovorus L.R. Jones

About 10% of the plants were affected by hollow stalk in 2 plantations in the L'Assomption district, Que.

MOSAIC - Virus

Mosaic was decidedly prevalent in western Ontario, especially on the lighter soil; secondary infection resulted in considerable injury. On several farms in Norfolk county, where the growth of the plants was followed the following percentages of mosaic

were recorded.

Severe mosaic ,	Mild mosaic
24%	61%
60%	23%
26%	58%
8%	31%
3%	6.5%
10%	30%

In the last three fields the grower practised early roguing of mosaic plants. It explains,no doubt, the low percentage of severe mosaic in these fields as compared with the others.

In both the L'Assomption and Farnham districts, Que., mosaic was present; in the former, mosaic spread rapidly and infection was on the increase. The disease was also present in British Columbia.

RING SPOT - Virus

Ring spot was reported in a few Burley fields in Essex and Kent counties, Ont.; infection was very localized.

FRENCHING - Nitrogen deficiency

A few isolated cases of frenching were reported from Norfolk county, Ont., and the Sumas district, B.C.

PHYSIOLOGICAL LEAF SPOT

This condition, though not serious, is quite prevalent in localized areas in all tobacco growing districts.

LEAF DROP - Cause unknown

Leaf drop is quite common where Burley is grown in the Kelowna district, B.C.

FIRING - Drought and heat.

Tobacco suffered considerably from firing in the higher fields on light sandy soils in western Ontario.

WIND and HAIL

Severe wind storms caused some damage here and there. Hail was the cause of heavy losses in a few plantations near Windham and Vanessa in Norfolk county, Ont.

FROST

Heavy frosts damaged about 1,000,000 lbs. of tobacco in the Norfolk district, Ont., in the early fall.

POTASH HUNGER

One field of Burley tobacco was severely affected by potash hunger in the Essex-Kent area, Ont.

SORE SHIN - Rhizoctonia Solani Kühn

Although sore shin caused by Rhizoctonia was seen several times in Norfolk county, Ont., the disease is of little importance.

(3) Curing Barn

POLE BURN

Some injury from pole burn was reported in scattered localities in Quebec.

TOMATO

BLOSSOM-END ROT - Non-parasitic

B.C.- Blosson-end rot was found in one field in Victoria district. Bonnie Best and Paynes Victory were severely affected, while Best-of-All, Lucky 13 and Essex Wonder showed less injury.

Man.- Tomatoes affected with blossom-end rot were received from St. Léon at the Ottawa Laboratory. The correspondent stated the crop was almost a total loss.

Ont.- Blossom-end rot was widespread and prevalent in many districts in Western Ontario and on several varieties. Weather conditions this year favoured the development of the disease.

N.B.- Blossom-end rot caused severe damage in Queens and Victoria counties.

P.E.I.- In a garden in Queens county 15% of the fruit was affected.

MOSAIC - Virus

Ont.- In a greenhouse in Welland county in October 100% of the plants were affected with mosaic. The growth of the plants was stunted.

Que.- Mosaic was reported from Macdonald College and it developed on seedlings grown from imported seed at Ste. Anne de la Pocatière.

P.E.I.- Two and 60% of the plants respectively were affected by mosaic in 2 gardens in Queens county.

STREAK - Virus

B.C.- Streak caused an average loss of 5% of the crop in several greenhouses in the Victoria district.

Ont.- Streak severely affected 10% of the plants in a greenhouse in Welland county.

LEAF MOULD - Cladosporium fulvum Cke.

B.C.- Leaf mould was general in several greenhouses. It reduced the yield from 0.5 to 20%. Control measures are gradually being adopted.

Alta.- In a commercial greenhouse at Edmonton the plants were infected 100% by leaf mould.

Ont.- Outbreaks of leaf mould were observed in several greenhouses in Lincoln county. Riverside Favourite, a supposedly resistant variety, showed 75% infection in October.

Que.- Leaf mould caused some defoliation on different varieties in the field at Macdonald College.

N.B.- This disease was common in the field in York, Victoria, Sunbury and Carleton counties; the damage was slight.

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

P.E.I.- Early blight caused severe damage in Queens county. Infections on the fruit ranged from a trace to 65% and on the leaves from a trace to 80%. It is the worst outbreak on record.

LEAF SPOT - Septoria Lycopersici Speg.

Que.- Leaf spot caused some defoliation on various varieties at Macdonald College.

WILT - Fusarium sp.

B.C.- Wilt caused the loss of 60% of the plants in one greenhouse and 5% in another near Victoria.

STEM ROT - Botrytis sp.

B.C.- A stem rot due to Botrytis caused small losses in several greenhouses near Victoria. A few fruits attacked by Botrytis were reported from a greenhouse, at Summerland.

WILT - Sclerotinia Sclerotiorum (Lib.) de Bary

B.C.- A single affected specimen was seen in a greenhouse at Summerland. Sclerotia were common on the stem about 12" above the ground, where infection apparently took place through a wound.

STEM ROT - Pythium sp.

Ont.- A few plants, just after they were set out, were destroyed by stem rot and had to be replanted in a field in York county.

BUCKEYE ROT - Phytophthora parasitica Dastur

B.C.- Buckeye rot was found in several greenhouses in Victoria district in the bottom trusses with 1% of the fruit affected.

BACTERIAL CANKER - Bacterium michiganense (E.F.Sm.) Stev.

B.C.- About 800 plants were destroyed by bacterial canker on one farm, near Summerland.

Man.- Bacterial canker caused some injury in gardens at Winnipeg.

TURNIP

CLUB ROOT - Plasmodiophora Brassicae Wor.

Que.- Club root infected 8% of the swedes in a field in Kamouraska county.

N.B.- Club root was widespread on turnips in the province. In 112 gardens examined, infection ranged from 0 to 100%; the damage similarly varied from slight to severe.

N.S.- Club root was found in 3 out of 6 fields examined in Colchester and Kings counties. In the infected fields it caused 5 to 25% damage.

P.E.I. The loss from club root was estimated to be $8,000. in the 3 counties. It was found on Bangholm, Halls Westbury, Hazards Improved, Millpond and Ditmar.

BROWN HEART - Non-parasitic

Ont.- Brown heart is widespread in turnip-growing sections. It was more conspicuous in early sowings. In one field in Wellington county 25 to 40% of the roots were useless on account of brown heart.

Que.- Three to 100 per cent of the swedes were affected by brown heart in the several varieties and strains grown at Macdonald College. The damage was correspondingly slight to severe.

The disease was observed in Kamouraska, L'Islet and Bellechase counties. It was less severe on farms where no chemical fertilizers were used or where the crop was grown on light, well-drained soil and harvested early in the fall. Large roots were more frequently affected than small. In one farm half the crop was useless.

N.B.- In 17 fields examined in Westmoreland, York, Carleton, Sunbury, Queens and St. John counties, brown heart caused slight to severe damage. It is probably the limiting factor in turnip production.

P.E.I.- Brown heart caused a loss of $25,000 to $30.000 in Prince Edward Island this year. It was particularly destructive in Queens county and part of Kings. The liberal use of barnyard manure prevents its occurrence (R.R. Hurst).

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

Que.- Black heart was unusually destructive this year at Macdonald College on swedes. Infections ranged from 10 to 85%.

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

P.E.I.- Storage rot causes slight to severe damage to turnips in the winter months in Queens county.

DRY ROT - Phoma Lingam (Tode) Desm.

N.S.- The dry rot organism was isolated from diseased swedes

received in February at Kentville from Yarmouth county.

P.E.I.- Severe damage was caused by dry rot to Halls Westbury in all counties; other varieties were less severely affected.

SCAB - Actinomyces scabies (Thaxt.) Güssow

P.E.I.- Ditmar was very slightly affected by scab in Prince and Queens counties.

SOFT ROT - Bacillus caratovorus L.R. Jones

Que.- Soft rot was very severe in some cases at Macdonald College. This rot may be caused by several organisms, of which Bacillus carotovorus is certainly one. (J.G. Coulson)

N.S.- Soft rot caused 2% damage to the Ditmar variety at Kentville.

IV. DISEASES OF FRUIT CROPS

APPLE

SCAB - Venturia inaequalis (Cke.) Winter
(Fusicladium dendriticum (Wallr.) Fuck.)

B.C.- Scab was fairly general on Vancouver island on all varieties of apples. McIntosh, Northern Spy and Fameuse were most severely diseased, while Yellow Transparent and Duchess were less heavily scabbed.

Scab was severe in the Lavington district; 75% of the fruit on unsprayed trees of McIntosh were infected. It was not so severe on other less susceptible varieties, some even being free of scab. In the Salmon Arm district, where scab was severe in 1932, it caused only slight infection this year. McIntosh showed little scab and the fruit infections were of the "pin point" type. Scab was first noted on the leaves on June 16. In the Kelowna district scab was general on McIntosh, but the disease was not severe.

In the Kootenay Lake area the following counts give evidence of the prevalence of scab in different parts of the district and the benefits of spraying: At Nelson, McIntosh, unsprayed, of 168 apples on a tree all were scabby and none were of marketable size; sprayed, an average of over 1,000 apples per tree were grown, a marked reduction in set on the unsprayed trees is evident; at Sunshine Bay, McIntosh unsprayed, of 282 apples on one tree, 67.7% were scabby; sprayed, over 1,000 apples per tree were produced, of which 2 to 10% were scabby; at Queens Bay, Rome Beauty, on one unsprayed tree there were 115 apples, all scabby, entire crop filled ¼ of an apple box; sprayed trees of similar age and size in the same orchard bore 1,300 to 2,300 apples per tree; Cox Orange, unsprayed 490 apples, of which 46.5% were scabby; at Boswell, McIntosh, one unsprayed tree produced 2,477 apples, of which 58.8% were scabby; Cox Orange, unsprayed, 408 apples of which 25% were scabby, most of the lesions were small and were healed over at picking time. Although a glance at the map would suggest that weather conditions would be somewhat similar throughout the Kootenay Lake area, marked variation in the severity of apple scab in the orchards along the Lake may be seen by comparing the light infection at Boswell, near the southern end of the Lake with those at Nelson, Willow Point and Queens Bay along the West Arm. This variation appears to be correlated with a difference in rainfall. (J.W. Eastham)

	Monthly Rainfall						
	April	May	June	July	Aug.	Sept.	Average of
Boswell	1.05	1.40	2.24	.98	1.03	1.48	18 years
Nelson	1.56	2.19	2.61	1.46	1.44	1.84	31 "

Near Burton in the Arrow Lakes district an unsprayed McIntosh

tree bore 754 apples, of which 99.2% were scabby.

Ont.- Scab was markedly less severe this year than in 1932, in Lincoln county. Unsprayed McIntosh trees showed heavy infections, 100% of the fruit being scabby. In sprayed orchards, 0 to 10% of the fruit were scabby. (G.C. Chamberlain)

Que.- Apple scab was very prevalent in 1933 in western Quebec on the two important varieties, McIntosh and Fameuse. Even orchards, which are usually free from scab, did not escape. The reason was that on two occasions, two important sprays were delayed on account of rain, when ascospore discharge took place.

The first period was just before the pink spray and sepal infections were the result; the second came at the end of the blooming period and resulted in spreading the spots to the side of the fruits. At the same time, ascospore discharge continued and numerous leaf infections occurred. In orchards, where the advanced green-tip spray was not applied, 50% of the fruits were scabbed near the calyx end, while in those which were protected by this spray, only 10% of the crop became infected. On account of the unusually dry weather during early summer, secondary infection was of no importance. On the other hand, cool weather accompaned by rain at the end of August and the beginning of September favoured heavy late infection in nearly all orchards. Only those, which were sprayed about August 16 as recommended by the Spray Service, were relatively free from this infection. (Fernand Godbout)

In Kamouraska and L'Islet counties little scab infection was observed in sprayed orchards; in many, even traces could not be found. On the other hand, scab was more or less prevalent on the leaves and fruits on all unsprayed trees. Infection ranged from 25 to 100%. The disease was less severe this year on account of the dry season and probably the amount of initial infection was reduced by the destruction of the perithecia during the successive freezing and thawing of last year's leaves when the ground was bare in January and February. (C. Perrault)

N.B.- Scab was severe on unsprayed trees of McIntosh and Fameuse in York, Sunbury and Queens counties. First ascospore discharge was observed on May 17. Late infection occurred on MacIntosh and Fameuse at the Experimental Station, Fredericton; 10 to 15% of the fruit was affected.

N.S.- Ascospore discharge was light throughout the spring season and very little scab was present till after Sept. 1. Severe late infection occurred during September and October, up to 100% of the fruit being affected in some orchards. However, very little scab developed in those orchards receiving a late Bordeaux spray in July. (J.F. Hockey)

P.E.I.- Scab caused slight to severe damage on MacIntosh in Queens county, but where spray was applied according to schedule scab outbreaks were insignificant.

FIRE BLIGHT - Bacillus amylovorus (Burr.) Trev.

B.C.- Fire blight was general on Spitzenburg and King varieties at Penticton and Summerland, but the damage was not severe. A slight amount of the disease was observed at Salmon Arm.

A culture of bacteria isolated from fire blight infections on a pear tree growing at Saanichton was received at Ottawa from Mr. W. R. Foster of that Laboratory. The organism was identified as Bacillus amylovorus. (H. N. Racicot)

Sask.- Although fire blight was only reported for the first time in Saskatchewan in 1932 (Can. Plant Div. Survey 12:61), it was present in epidemic form not only at Saskatoon, but also in southern Saskatchewan. Both blossom and twig infection was severe in the University orchards, Saskatoon, where whole branches were killed. These trees are mostly crab apples. In 3 widely scattered gardens in Saskatoon, the owners reported their crab apple trees were badly affected.

Man.- Fire blight caused a serious twig blight of seedlings at Morden.

Ont.- Fire blight was quite general in Lincoln county, being observed on Greening, Duchess and McIntosh. It was apparently more prevalent than usual. Severe blossom infection was reported on McIntosh from Cornwall and a correspondent from Alfred reports that his whole orchard of Wealthy is affected by fire blight, which is causing great injury.

Que.- Fire blight was less prevalent this year in Quebec than in 1932. It was present in all the apple growing districts, but in many orchards only a trace was present or it was entirely absent. The smaller amount of disease was due largely to dry weather during mid-summer, but the more careful removal of infections by growers probably was a factor.

Fire blight was more prevalent in the Abbotsford and the Chateauguay districts than in the others. At Abbotsford both blossom and twig blight were severe in 2 orchards on Alexander, Switzer, Winter Arabka and other Russian varieties and on trees of other varieties adjacent to these. Twig blight was present in 16 other orchards and absent in 12. In the Chateauguay district a moderate amount of twig infection occurred in June, but the dry weather checked any further spread. Twigs were moderately infected in one block of large Fameuse trees at Hemmingford, and in 3 orchards, which were adjacent to a few neglected, severely blighted trees, at Franklin Centre. Blossom blight was severe in one and present in a few other young orchards in the Freleighsburg-Cowansville district. Fire blight was severe in one orchard of mixed varieties in Sherbrooke county and one in Megantic. (H.N. Racicot)

Fire blight was severe on Alexander, resulting in the loss of some trees, and caused twig infection on Fameuse and McIntosh at Macdonald College. It was reported to be severe at Richmond

and Hudson Heights.(R.F. Suit)

In Kamouraska county fire blight was severe in 2 small orchards and traces were present in 3 others. (C. Perrault)

P.E.I.- Fire-blight may be found in any uncared-for orchard in this province. All the McIntosh trees in an orchard in Queens county were destroyed by it. (R.R. Hurst)

BLACK ROT - Physalospora obtusa (Schw.) Cke.

Stevens (Mycologia 25:536. 1933) has shown that the perfect stage of the organism causing black rot should be called Physalospora obtusa (Schw.) Cke. For the imperfect stage as it occurs on apple, I would suggest that the name Sphaeropsis Malorum Peck be retained. (I.L. Conners)

Sask.- A trace of black rot was found on the upper dead limbs of a half dead tree in the University orchard, Saskatoon. The fungus may have been secondary, the trees have suffered considerably from winter killing.

Ont.- Extensive black rot cankers on the limbs of Northern Spy were sent from Aldershot to the St. Catharines Laboratory.

N.B.- A trace of black rot was found on the fruit in an orchard in Queens county.

N.S.- Black rot was very common on Astracken at Kentville and was present on several other varieties following arsenical injury to the calyx end of the fruits. (J.F. Hockey)

RUST - Gymnosporangium clavipes Cke. & Pk.

Que.- Apples were almost free from rust infection this year in Kamouraska county, not only in orchards, which were sprayed, but also in those which were not This is in marked contract to 1932 when in some unsprayed orchards, up to 65% of the fruit were affected. (E. Campagna)

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

N.S.- Crown gall was found on 10 trees of Juane de Metz out of 200 set out in 1931 at Kentville.

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

B.C.- Powdery mildew was fairly general on all varieties, particularly King and Gravenstein at Saanichton. It caused no appreciable loss.

ANTHRACNOSE - Pezicula malicorticis (Jacks.) Nannf.
(Cryptosporiopsis malicorticis (Cordley) Nannf.)

B.C.- Yellow Transparent was severely affected by anthracnose in the Fraser valley.

CROWN ROT - Non-parasitic

B.C.- Crown rot was serious in many orchards in Kelowna, Penticton, Summerland and Vernon districts.

TWIG BLIGHT - Cytospora sp.

Sask.- Cytospora was found fruiting in abundance on a newly-dead branch in the University orchard, Saskatoon. The branch was 8 ft. long and had been killed after it was budded.

TWIG BLIGHT - Nectria cinnabarina (Tode) Fr.

P.E.I.- Traces of twig blight were present on wild trees along the roadside in Queens county.

SUN SCALD - Non-parasitic

B.C.- Sun scald was general throughout the Kelowna, Summerland, Penticton and Olive districts. Although this summer was not exceptionally hot, rapid changes took place from cool cloudy days to clear hot weather.

BITTER PIT - Non-parasitic

B.C.- Bitter pit was general in the Okanagan valley but the damage was not severe.

CORKY CORE - Non parasitic

B.C.- Corky core appears to be increasing in the Summerland and Penticton districts, where it is general and serious.

N.B.- Corky core affected 50% of the McIntosh and 100% of the Fameuse apples in one orchard in Sunbury county, the damage was severe.

BITTER PIT or BLOTCHY CORK - Non-parasitic

N.S.- Up to 50% of the fruit of Stark were affected in the orchards on sandy shallow soil near Middleton. The disease is present to some extent throughout the Annapolis valley on Stark, Twenty Ounce Pippin, Baxter, Baldwin and some other varieties. It is of the blotchy cork type, which appears in the fruit in the orchard and not the true "bitter pit" found in storage. (J.F. Hockey)

DROUGHT SPOT

B.C.- Drought spot is apparently on the increase in the Summerland and Penticton districts, where it is general and serious. It was also reported from Salmon Arm.

Ont.- Greening apples affected with drought spot or bitter pit were received from Burlington at the Ottawa Laboratory.

Que.- Seedling apples affected with drought spot or bitter pit were received from Argenteuil county at the Ottawa Laboratory. All the apples on one tree were said to be so affected.

N.S.- Drought spot was observed in the fruit at Kentville a few days after petal fall in trees on the fertilizer plots, which had received heavy applications of lime or lime phosphate. Over 60% of the fruit was affected on some trees.

INTERNAL CORK (Including Corky Core) - Non-parasitic

N.S.- Internal cork was common at Kentville in the fruit on the fertilizer plots, where lime was applied with other elements or alone. A trace was present on the plots receiving complete fertilizer and lime. Gravenstein and McIntosh were the varieties affected.

Wolf River and Gravenstein were also affected in commercial orchards on sandy shallow soils receiving nitrogen fertilizer only. (J.F. Hockey).

STORAGE PIT - Non-parasitic

N.S.- Storage pit was found affecting up to 10% of the fruit of Cox Orange in storage Dec. 1933. Lower percentages were affected in a few other varieties.

SOFT SCALD - Non-parasitic

Ont.- A small quantity of Northwest Greening apples held in cold storage in Lincoln county were useless on account of soft scald in January. The fruit were somewhat immature when picked.

GREY MOULD ROT - Botrytis sp. (B. cinerea group)

B.C.- A few McIntosh apples were affected with grey mould rot, while they were still on the tree about Salmon Arm and Kelowna in October. About 1% of the fruit were similarly rotted, at Vernon and Lavington.

PINK ROT - Tricothecium roseum Lk.

Que.- Pink rot was common chiefly on Fameuse following late scab infection in Jacques Cartier county. The damage was slight.

P.E.I.- In October 1% of the McIntosh fruit was affected with pink rot in Queens county.

HAIL - Non-parasitic

B.C.- Exceptionally heavy hail fell in parts of Summerland and Penticton districts accompanied in some places by a gale. The result was that in some orchards all the apples were reduced to the lowest grade on account of skin cuts and bruises. Hail damage occurred in 500 acres of orchard in Penticton and 100 in Summerland.

FROST - Non-parasitic

B.C.- An early fall frost accompanied by snow was experienced throughout the Okanagan valley before late fall and winter varieties had been picked. Actual freezing of the fruit resulted in a very slight loss, but it caused a great many of the McIntosh apples to fall from the tree in some districts and the snow broke many trees. (J.C. Roger).

WINTER INJURY - Non-parasitic

Que.- Most orchards suffered the loss of a few trees killed

by frost in Kamouraska and L'Islet counties. In the Experimental Station orchard, Ste. Anne de la Pocatière, 6 trees were killed outright and 8 others were half or partially dead. Winter conditions were very unfavourable for apple trees.

APRICOT

CANKER - Valsa ?cincta Fr.

Ont.- A canker was found on a young apricot tree, which was surrounded by peach trees in an orchard in Lincoln county. From it was isolated a "white" Cytospora, the cause of peach canker. (R.S. Willison)

UNEVEN FRUIT DEVELOPMENT - Cause unknown

B.C. - Fruit showing uneven development were received from Wilsons Landing and some were seen in an orchard at Summerland.

DROUGHT SPOT - Non-parasitic

B.C.- Drought spot was general in the Summerland and Oliver districts, but the damage was not severe.

BLACKBERRY

ORANGE RUST - Gymnoconia Peckiana (Howe) Trotter

Ont.- Orange rust was very prevalent and severe in a plantation of Kittatinny in Lincoln county, 60% of the new growth was affected. In one of Eldorado, 10% of the plants were rusted. This plantation was rogued to prevent the rust from spreading.

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

Que.- Septoria leaf spot moderately to severely infected 6 plants of Ancient Briton at Macdonald College.

CHERRY

SHOT HOLE - Higginsia hiemalis (Higg.) Nannf.
(Cylindrosporium hiemalis Higg.)

P.E.I.- Shot hole caused slight to severe damage in all 3 counties on both cultivated and wild cherries.

BLOSSOM BLIGHT - Sclerotinia cinerea Schroet.

B.C.- About 50% of the blossoms were blighted in some orchards on Vancouver island.

GREY MOULD ROT - Botrytis sp. (B. cinerea type)

B.C.- Grey mould rot caused considerable damage to sweet

cherries in the Nelson district. The fruit was affected before it was ready to be picked.

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

Ont.- Black knot was very prevalent in all neglected orchards of sour cherries in Grey county.

N.B.- Black knot was common in York, Sunbury and Queens counties.

P.E.I.- Black knot infection was very heavy on wild cherries in Prince county; the damage was severe, some trees being killed. Frequent outbreaks of black knot were also reported from orchards in Queens county.

WITCHES' BROOM - Taphrina Cerasi (Fuck.) Sadeb.

B.C.- Leaves on one limb of a 3-year old Bing cherry tree were diseased by Taphrina Cerasi. (H.R. McLarty)

DIE-BACK - Non-parasitic

B.C.- Die-back was prevalent and serious in those parts of the Penticton and Summerland districts, where cherries are grown.

SPLITTING - Non-parasitic

B.C.- Splitting was very serious this year in Penticton, Summerland and Oliver districts, but it was most severe on the Bing variety, which was ready for harvest when several rain showers occurred.

SCAB - Cladosporium carpophilum Thum.

Ont.- From 20 to 25% of the fruit was spotted by scab in orchards of sour cherry in Grey county.

GUMMOSIS - Cause unknown

P.E.I.- Gummosis, probably a form of winter injury, affected 50% of the trees on a fruit farm at Southport. The damage to the individual tree varied from slight to severe.

CRANBERRY

FALSE BLOSSOM - Non-parasitic

N.S. - False blossom appeared in a number of cranberry bogs in the Annapolis valley in 1933. The disease was recognized from specimens sent to Dr. H. J. Franklin. In communicating this discovery, Dr. N.E. Stevens stated that it is the most serious disease of cranberry known in the United States. The yield of the bogs in New Jersey has fallen 30% since 1923, a decline that Dr. Stevens believes to have been chiefly, if not solely, due to the false blossom disease (cfr. Phytopath 23:984. 1933). (I. L. Conners)

GALL - Synchytrium Vaccinii Thomas

N.S.- Specimens of cranberry affected by gall were received from Port Mouton by Mr. K. A. Harrison of the Kentville Laboratory. The identification was verified at Ottawa.

CURRANT

WHITE PINE BLISTER RUST - Cronartium ribicola Fischer

Ont.- Blister rust caused severe defoliation in a row of 50 plants of Black Victoria by July 27 in Simcoe county.

Que.- Blister rust was prevalent at Macdonald College. Black currants were severely infected by August 5, and completely defoliated by August 18. Red currants were somewhat less heavily rusted and were defoliated on Sept. 10.

N.B.- Blister rust was common on wild and cultivated currants in York, Westmoreland, Queens and Sunbury counties.

P.E.I.- This rust was widespread in the province and was severe in all gardens, where black currants were grown. Defoliation followed heavy infection. It is also fairly common on wild currant. Late infections were observed at Charlottetown.

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

Alta.- A light infection of this leaf spot was reported from Edmonton.

P.E.I.- Septoria leaf spot was heavy in a garden in Queens county and moderate at the Experimental Station, Charlottetown, on cultivated currants.

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

Alta.- Moderate to severe infections of powdery mildew were common on currants in zone 10.

Sask.- Black and red currants respectively were moderately and slightly affected by powdery mildew in the University gardens, Saskatoon. Although it is present every year, it was not as severe as usual.

GOOSEBERRY

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

Ont.- Fruits affected with powdery mildew were received from Dryden. It was reported that powdery mildew was prevalent in a garden in Kent county.

CLUSTER-CUP RUST - Puccinia Pringsheimiana Kleb.

Man.-This rust was rather injurious both at Winnipeg and Morden, probably because of the damp spring.

GRAPE

BLACK ROT - Guignardia Bidwellii (Ell.) Viala. & Rav.
B.C.- Black rot caused considerable damage to the fruit on several vines of Seedless grapes at Saanichton.

DOWNY MILDEW - Plasmopara viticola (Berk. & Curt.) Berl. & de Toni
Que.- A slight infection of downy mildew was seen on Aug. 1, at Macdonald College.

POWDERY MILDEW - Uncinula necator (Schw.) Burr.
(Oidium Tuckeri Berk.)
B.C.- A few plants were affected by powdery mildew near Victoria.

LOGANBERRY

ANTHER and STIGMA BLIGHT - Haplosphaeria deformans Syd.
B.C.- Anther and stigma blight was fairly general on Vancouver island; it caused much damage.

CROWN GALL - Pseudomonas tumefaciens (Sm. & Towns.) Dugg.
B.C.- Crown gall was found heavily infecting a patch of loganberry near Victoria.

SEPTORIA LEAF SPOT - Mycospaerella Rubi Roark
(Septoria Rubi West.)
B.C.- This leaf spot was fairly general on loganberry on Vancouver island.

NECTARINE

POWDERY MILDEW - Sphaerotheca pannosa (Wallr.) Lév.
B.C.- Nearly all the leaves on the terminal growth of the nectarine trees growing at the Experimental Station, Summerland, were affected with powdery mildew.

PEACH

SCAB - Cladosporium carpophilum Thum.
Ont.- From 15 to 20% of the fruit were scabbed on Aug. 17 in one orchard of Rochester in Lincoln county.

LEAF CURL - Taphrina deformans (Berk.) Tul.
B.C.- Leaf curl was found on Elberta in the Laboratory orchard, Summerland. It has also been observed at Penticton. This disease is only found occasionally in the Okanagan valley and never more than a few leaves per tree are attacked.
Ont.- Leaf curl was first observed on May 13 in Lincoln county. It was particularly noticeable on Elberta, but it was also found on South Haven, Rochester, and June Elberta. On

unsprayed trees up to 100% infection was present, while on those, which were sprayed, infection was uncommon and slight.

Que.- A few peach trees, growing at Franklin Centre were moderately infected by leaf curl.

N.S.- Leaf curl almost completely deformed the foliage of the two trees at Kentville.

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

B.C.- Powdery mildew has become increasingly severe each year in the Summerland and Oliver districts, and in a few orchards, where the trees are closely planted, the loss of fruit was considerable in 1933.

Ont.- In one orchard of Elberta in Lincoln county the fruit were severely infected by powdery mildew, and in consequence were blemished. The leaves were only lightly infected.

PEACH CANKER - Valsa sp. (tentatively V. cincta Fr.)

Ont.- In the orchards under observation in Lincoln county, a large number of incipient cankers were found in the vicinity of the buds. These lesions suggested that the fungus had entered via the leaf scar rather than through the bud. Many cases were observed especially in nursery stock where a twig had been killed and the canker had spread into the main branch. The organism was isolated from such lesions. Also a number of cases were seen where invasion had taken place through a grafting or pruning wound, improperly made. Where the top of the stock was removed some of the grafts were girdled. (R.S. Willison)

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

Ont.- Owing to the warm dry weather in the early part of the season in Lincoln county, little rot developed on the early varieties, which are usually affected. However, weather conditions became very favourable for the disease and for the rapid maturing of the fruit. In consequence, brown rot soon became epidemic, and caused losses as high as 30% of the fruit, especially in mid-season varieties, such as South Huron and Vidette. The total loss was estimated to be 400 tons. It was the worst outbreak of brown rot in 12 years and was considered by some growers to be the worst ever experienced. (G.C. Chamberlain & R.S. Willison)

COLLAR INJURY - Non-parasitic

Ont.- About 20% of the trees were girdled at the ground level and killed in an orchard in Lincoln county on account of late cultivation the previous year.

PEAR

FIRE BLIGHT - Bacillus amylovorus (Burr.) Trev.

B.C.- Fire blight usually infected pears but slightly in the

Penticton and Summerland districts. Some varieties, such as Flemish Clapp, may occasionally be seriously affected.

Ont.- Fire blight was noticed in many pear orchards in Lincoln county. In a 5 year orchard containing 2,000 trees of Bartlett and Anjou, 50% of the trees were severely damaged, many branches being killed.

SCAB - Venturia pyrina Aderh.

B.C.- Scab was observed on Flemish Beauty pears at Salmon Arm.

Que.- Scab was present in nearly all orchards of susceptible varieties in western Quebec. The percentage of infection depended upon the spray schedule employed.

P.E.I.- A trace of scab was seen on 2 trees at the Experimental Station, Charlottetown.

DROUGHT SPOT - Non-parasitic

B.C.- Drought spot was severe only on a few trees in one orchard, although it may be found in both the Penticton and Kelowna districts.

BLACK END ROT - Non-parasitic

B.C.- Black end rot is severe on a few trees scattered in many orchards in the Penticton and Oliver districts.

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

B.C.- Powdery mildew was general, but not severe in all pear orchards of the Summerland and Penticton districts.

LEAF BLIGHT - Entomosporium maculatum Lév.

P.E.I.- Leaf blight damaged young pear trees at Brackley Beach.

PLUM

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

B.C.- Although black knot has been found on both Vancouver island and the lower mainland, up to the present it has not been a serious disease. Very few growers attempt to control the disease by pruning out the galls. (Wm. Newton)

Que.- A correspondent in Chateauguay county reported that his trees were badly affected with black knot, a specimen of which was submitted. All trees in uncared-for orchards in Kamouraska county are affected, many being killed. Fortunately these orchards are very small and are gradually disappearing.

N.S.- A trace of the conidial stage of the black knot fungus was collected in June at Kentville.

P.E.I.- Black knot was observed on several varieties in orchards in Queens county; severe infections being present on

Damson at Montague. The disease is prevalent in uncared-for orchards.

PLUM POCKETS - Taphrina Pruni (Fuck.) Tul.

Man.- Plum pockets was abundant early in the season but dry weather checked secondary infections. (G.R. Bisby)

Que.- Plum pockets destroyed all the plums in one orchard in Two Mountains county.

P.E.I.- A heavy infection of plum pockets was reported on a few trees in Queens county.

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

Ont.- Brown rot was reported to have destroyed all the fruit on one tree at London.

Que.- About 70% of the fruit were affected by brown rot in a few trees at Chateauguay Basin. Rotted specimens were received from Hudson Heights and Beaurepaire, Que.

N.B.- Most of the fruit of Victoria Burbank were infected with brown rot in an orchard in Kings county. The trees bore a heavy crop of bloom and many blossoms as well as the fruit were affected.

P.E.I.- A trace of brown rot was observed in an orchard in Queens county.

SHOT HOLE - Higginsia prunophorae (Higg.) Nannf.
(Cylindrosporium prunophorae Higg.)

P.E.I.- Shot hole caused slight to severe defoliation depending on the variety infected in several orchards in Queens county.

SCAB - Cladosporium carpophilum Thum.

Que.- Plums affected by scab were sent from Athabaska to the Ottawa Laboratory.

FIRE BLIGHT - Bacillus amylovorus (Burr.) Trev.

Sask.- A few diseased twigs were found on plum trees growing next to severely diseased apple trees in the University orchard, Saskatoon; the damage was negligible. (T.C. Vanterpool)

Man.- Fire blight was found for the first time on plum in Manitoba, when it was collected on Prunus nigra at Dauphin in August.

SEEDLING BLIGHT - Cause unknown

Sask.- Rhizoctonia mycelium was present on the base of blighted seedlings in the University gardens, Saskatoon.

HAIL INJURY - Non-parasitic

Man.- Many plums in the College orchard, Winnipeg, developed brown sterile spots after a small hail storm. (G.R. Bisby)

RASPBERRY

SPUR BLIGHT - Didymella applanata (Niessl) Sacc.

B.C.- Spur blight was fairly general in a few Cuthbert patches on Vancouver island.

Ont.- Spur blight was severe on Herbert and also present on Viking specimens received from Ryland at Ottawa.

Que.- Spur blight was not nearly so severe this year as it was in 1932. It was present in all plantations of Herbert throughout the province, and in a few of these, it was severe. It was also observed in decreasing amounts on: Latham, Cuthbert, Newman, Brighton, Viking and Newburg. In a varietal plantation at Macdonald College spur blight was found as follows: on Hailsham, very severe on both stems and leaves; on Herbert, severe; on Golden Queen, Sunbeam, Cayuga and Norfolk Giant, moderate to severe; on Latham, Devon, Lloyd George, Cuthbert and Beaumfort Seedling, moderate; on Goliath, trace to moderate; on Viking, trace; and on Queen Alexandra, none. A trace was also present on the black raspberry, McDermids Seedling 17. (H.N. Racicot)

P.E.I.- Spur blight is widely distributed in the province; slight to heavy infections occurred on Viking and Cuthbert.

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

B.C.- A slight infection of Septoria leaf spot was found on a few plants on Vancouver island.

Alta.- Sunbeam was heavily infected in the University garden, Edmonton.

Ont.- Some canes of Newman from Martintown were found infected with Rhabdospora Rubi Ell.

Que.- In a varietal plantation at Macdonald College, the varieties were infected as follows: Queen Alexandra and Devon, severe; Lloyd George, moderate to severe; Herbert, moderate; Viking, Goliath and Cuthbert, trace; Latham, Golden Queen, Hailsham, Sunbeam, Cayuga, Norfolk Giant and Beaumfort Seedling, none.

MOSAIC - Virus

B.C.- Mosaic was fairly general in raspberry plantations on Vancouver island and the lower mainland. An average of 2.3% of the plants were affected with mosaic in a 15 acre field of Latham in the Kelowna district. Mosaic was also observed at Salmon Arm.

Alta.- Leaf roll and mosaic lightly infected the one variety, Sunbeam, in the University garden, Edmonton.

Ont.- Mosaic was found commonly in commercial plantations, particularly those of Cuthbert and Viking varieties. Percentage of infection varied from 5 to 75%. The symptoms of the disease were greatly masked by high temperature this summer, but late in the season much faint mottling could be detected in the new growth. In certified plantations a trace to 2% of mosaic was

present. (G.C. Chamberlain)

Que.- A slight amount of mosaic was present in nearly all the Newman plantations, the highest percentages observed being 4 and 10% respectively. One plantation of Columbian showed 10% infected and one of King, 100%. The latter variety shows considerable tolerance to mosaic as this plantation has been infected since 1926 and is still yielding well under heavy applications of fertilizer each year. Mosaic was also observed in Cuthbert, Latham, Newman 20, Brighton and wild raspberries. In a varietal plantation at Macdonald the following percentages of mosaic were recorded: Latham and Sunbeam, 100%; Golden Queen, 90%; Cayuga, 60%; Norfolk Giant, 20%; Viking, 2%; Herbert and Devon, trace; Queen Alexandra, Hailsham, Goliath, Lloyd George and Beaumfort Seedling, none.

N.B.- Mosaic was common in plantations in Gloucester, York, Sunbury and Westmoreland counties.

N.S.- In a plantation in Pictou county, 1% of the Latham and 0.5% of the Viking plants were affected with mosaic. A Viking plantation was similarly affected in Colchester county.

P.E.I.- Mosaic was common and heavily infected some plantations.

LEAF CURL - Virus

Ont.- Leaf curl is not an important disease in Norfolk county, but 2% of the plants were affected with leaf curl in a plantation of Cuthbert. A specimen of Cuthbert affected with leaf curl was received from Perth.

Que.- A trace of leaf curl was observed in one plantation each of Cuthbert, Viking and Newman 20. In a varietal plot at Macdonald College leaf curl was observed as follows: Cayuga, 30%; Cuthbert and Hailsham, 5%; Viking, Queen Alexandra, Devon and Herbert, trace; Latham, Golden Queen, Goliath, Lloyd George, Norfolk Giant and Beaumfort Seedling, none.

ANTHRACNOSE - Elsinoe veneta (Burkh.) Jenkins
(Gloeosporium venetum Speg.)

Que.- Anthracnose was present in 50% of the Newman plantations inspected and was far less severe than in 1932, only a trace to moderate infections being present. It was also observed on Cuthbert, King, Latham, Viking and Herbert. In a plantation at Iberville on both Newman and Viking the canes were severely infected only at their tips as infection had taken place when the canes had resumed growth, after the mid-season drought. In a varietal plot at Macdonald College the following percentages of anthracnose were noted: Queen Alexandra, Devon and Lloyd George, severe; Sunbeam, moderate; Viking and Latham, slight; Hailsham, Cayuga, Cuthbert and Herbert, trace; Golden Queen, Goliath, Norfolk Giant and Beaumfort Seedling, none. Native wild black raspberry, Rubus occidentalis L., grown for breeding stock at Macdonald College was moderately to severely infected.

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

B.C.- A few old patches of Cuthbert were rather severely infected with cane blight in the Fraser valley.

Ont.- Canes showing blight were received from Essex county. The correspondent stated that 95% of the canes were similarly affected. Specimens of cane blight on Newman were received from Martintown.

Que.- Specimens of cane blight were sent from Montreal to Macdonald College.

BLUE STRIPE WILT - Verticillium sp.

Ont.- Wilt was found on Herbert in York county at one end of a new plantation. The land in this part had been the previous year in potatoes, which had shown considerable wilt. The other end of the plantation was free of disease. (D.F. Putnam)

Wilt was causing the death of 5% of the canes in a plantation of Viking and Cuthbert in Lincoln county. (G.C. Chamberlain)

On the current-year's canes of Cuthbert at St. Catharines, there were found whiteish areas commonly superficial on the "blue stripe", and embedded in the bark tissues on this area were innumerable fungous bodies corresponding closely in size and structure to the micre-sclerotia of V. Dahliae. In England I have observed this stage in nature on dead canes in late winter, but never on green canes in the fall. (R.V. Harris)

Que.- A few plants affected with blue stripe wilt were found in Viking plants at Macdonald College. The identity of the disease was confirmed by Dr. R.V. Harris. These plants were grown from stock, which had originated at Vineland, Ont. Apart from a doubtful record from Rimouski county in 1926, this is probably the first record of this disease in Quebec. (H.N. Racicot)

ASCOSPORA CANE SPOT - Ascospora Ruborum Zeller

Ont.- Canes of Newman from Martintown were found infected with Hendersonia Rubi West., the imperfect stage of the above fungus. (F.S. Thatcher)

YELLOW RUST - Phragmidium Rubi-idaei (DC.) Karst.

B.C.- Yellow rust was fairly general on most varieties in the Fraser valley and on Vancouver island. Cuthbert appears to be the most susceptible.

Alta.- Yellow rust was observed at Millet in zone 10.

LATE YELLOW RUST - Pucciniastrum americanum (Farl.) Arth.

Ont.- Late yellow rust was prevalent in a plantation of Viking in late September; the damage was a trace.

POWDERY MILDEW - Sphaerotheca Humuli (DC.) Burr.

Alta.- Raspberries were moderately infected with powdery mildew in zone 10 and at the Experimental Station, Lethbridge.

Man.- Powdery mildew, caused by S. Humuli var. fuliginea (Schlecht.) Salm., developed early at the Agricultural College, Winnipeg, but it did not become especially serious.

Ont.- Powdery mildew was very prevalent on Latham, an extremely susceptible variety, in a plantation in Wentworth county; the plants were severely stunted.

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

Ont.- Fifteen to 20% of the Viking plants were affected with crown gall in a plantation in Lincoln county.

Que.- A trace of crown gall was found in a plantation of Newman in Laval county. On account of the drought in July and early August, diseased plants dried up.

P.E.I.- Crown gall was found on a single Herbert plant in a plantation in Queens county.

SAND CHERRY

BLIGHT - Coryneum Beijerinckii Oud.

Sask.- Blight spots were found on the leaves, stems and fruit of sand cherry in the University orchard on July 21.

POWDERY MILDEW - Podosphaera Oxyacanthae (DC.) de Bary

Sask.- Powdery mildew heavily infected sand cherry from July onward, at Saskatoon.

PLUM POCKETS - Taphrina ?communis (Sadeb.) Gies.

Alta.- Sand cherries affected with plum pockets were observed at Ryley.

STRAWBERRY

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

B.C.- Leaf spot was fairly general on Vancouver island and in the Fraser valley. Infection was slight to moderate.

Que.- Leaf spot moderately infected strawberries in western Quebec.

N.B.- Leaf spot was common in York and Queens counties.

N.S.- Leaf spot was more or less prevalent in Colchester, Kings, Halifax and Pictou counties. In one patch of Senator Dunlop in Colchester county, 50% of the leaves were infected.

POWDERY MILDEW - Sphaerotheca Humuli (DC.) Burr.

Ont.- A trace of powdery mildew was found on May 31st in a planting of Glen Mary in Lincoln county.

P.E.I.- In a 3-acre plantation of Senator Dunlop in Queens

county the plants failed to produce marketable berries on account of powdery mildew. The berries did not colour and remained small in size.

ROOT ROT - Cause undetermined

Alta.- Specimens and reports from Athabasca and Cardston indicate that this root rot is common and severe. An undetermined fungus was isolated.

?XANTHOSIS - Virus

Ont.- An outstanding case was observed in June on a farm at Stamford. The owners complained of a marked falling off in recent seasons of the vigour of their stock of the Parson's Beauty variety, culminating in the present serious state of affairs when the prospects of even a barely economic crop appeared to be remote. It was found that the majority of the plants were at this time exhibiting unmistakable, although not distinctly defined, symptoms resembling those of the "Xanthosis" disease of Plakidas and of the "Yellow-edge" disease in England. Later the disease was successfully transmitted (by grafting methods) from typical plants from this plantation to healthy Royal Sovereign plants, the index variety used in England. The latter subsequently developed leaf symptoms which hitherto have been indistinguishable from those of the "Yellow-edge" disease occurring on this variety in England. This is the only case I have observed during the year in which, on the sole basis of the occurrence of leaf symptoms, virus attack could be diagnosed as a major cause of a deterioration of serious economic significance. In the late fall the same plantation was re-examined, and at this time it was impossible to distinguish the characteristic Xanthosis symptoms. (R.V. Harris)

V. DISEASES OF FOREST AND SHADE TREES

ALMOND (Amygdalus communis)

BLIGHT - Coryneum Beijerinckii Oud.

B.C.- Blight was found causing growth proliferations on almond on Vancouver island in April.

BALSAM FIR (Abies balsamea)

WITCHES' BROOM - Melampsorella Caryophyllacearum Schroet.

N.B.- This rust is common in York and Queens counties.

P.E.I.- Witches' broom is common and causes great damage to balsam.

BEECH (Fagus)

Cankers caused by Hypoxylon ?cohaerens (Pers.) Fr., occur commonly on the beeches in Prince Edward Island. (R.R. Hurst)

BIRCH (Betula)

LEAF CURL - Taphrina flava Farl.

N.S.- This disease was collected at Tremont on B. alba var. papyrifera. (R.W. Ward)

Branches covered with the acervuli of Melanconium parvulum Dearn. & Barth., were found on a dying tree of B. alba var. purpurea at Macdonald College. The fungus appeared to be parasitic, although the tree may have been weakened by root trouble. (Dorothy E. Newton)

ELM (Ulmus)

BLACK SPOT - Gnomonia ulmea (Schw.) Thüm.

Ont.- Black spot was widespread in Kent county, but it caused slight damage.

Que.- This disease heavily infected the leaves of elms in Jacques Cartier, Laval and Terrebonne counties.

N.B.- Black spot was found at one place each in York and Queens counties; infection was slight.

CANKER - Sphaeropsis ulmicola Ell. & Ev.

N.B.- Two trees were severely affected by this canker in West St. John.

EUROPEAN LIME (Tilia vulgaris)

Gloeosporium Tiliae Oud. caused heavy leaf drop to a European lime in Halifax. (K.A. Harrison)

HEMLOCK (Tsuga canadensis)

RUST - Thekapsora Vacciniorum Karst
(Peridermium Peckii Thum.)
N.S.- Specimens of this rust were collected at Cloud Lake by R.W. Ward. (I.L. Conners)

HORSECHESTNUT (Aesculus)

LEAF BLIGHT - Guignardia Aesculi (Pk.) Stewart
(Phyllosticta Paviae Desm.)
N.B.- Leaf blight was found on 2 trees at the Experimental Station, Fredericton.

MAPLE (Acer)

One large tree of box-elder (A. Negundo) was killed at Edmonton. Creonectria purpurea (L.) Seaver, was found fruiting on the dead branches.

Tar spot (Rhytisma acerinum (Pers.) Fr.) was reported to be general on maple in St. Hypolite Tp., Terrebonne Co., Que. One tree was found infected in Queens Co., N.B. Infection was fairly heavy on A. saccharinum and A. saccharum on Prince Edward Island.

Twig blight (Creonectria purpurea (L.) Seaver) slightly infected trees of A. rubrum in Queens county, P.E.I.

MOUNTAIN ASH (Sorbus)

FIRE BLIGHT - Bacillus amylovorus (Burr.) Trev.
Ont.- Fire blight caused serious damage to mountain ash trees at Cobourg in June. The organism was isolated. (D.H. Jones)
Que.- Fire blight was severe on three mcuntain ash trees at Macdonald College; large limbs were killed. On 2 other trees blossom blight was severe and some twigs and small branches were killed. The rest of the trees had only a trace of blossom blight or were free from the disease. In Kamouraska county some large limbs on 2 trees were infected; 3 others had some twig blight and the rest were free from disease.
P.E.I.- Many fine trees are severely damaged by fire blight

throughout the province.

PINE (Pinus)

WHITE PINE BLISTER RUST - Cronartium ribicola Fischer

Ont.- Blister rust on white pine (P. Strobus) was first observed in Algonquin Park by the present reporter in 1932, although some cankers were obviously several years old. Scattered infections were found killing the twigs and branches. (W.R. Haddow)

Que.- At Valmorin half the trees bore 2 to 12 infections of blister rust per tree. A slight infection of blister rust was seen at lake Connelly.

N.B.- Although the damage is still slight, blister rust is spreading.

N.S.- Many limbs were cankered by blister rust in a small group of trees at the Experimental Station, Kentville. Aecia were opening on May 3.

P.E.I.- Blister rust is severe in native stands and in ornamental plantings.

WITCHES' BROOM - Arceuthobium americanum Nutt.

Witches' broom was abundant on jack pine (P. Banksiana) at Prince Albert, Sask. (W.P. Fraser)

POPLAR (Populus)

LEAF BLIGHT - Sclerotium bifrons Ell. & Ev.

N.S.- A single small tree of P. tremuloides was found affected at Stillwater lake on June 16.

POWDERY MILDEW - Uncinula Salicis (DC.) Wint.

Alta.- Powdery mildew was found on P. tremuloides at Edmonton; moderate to severe infections were commonly observed on P. balsamifera in zone 10.

HYPOXYLON CANKER - Hypoxylon pruinatum (Klotzsch) Cke.

Ont.- A few trees of P. tremuloides bearing trunk cankers caused by this fungus in fruit were found at Achray in September. Severe damage was caused to young trees at Midhurst, Camp Borden, and in a tract along the Rouge river in York county. (W. R. Haddow)

SPRUCE (Picea)

WITCHES' BROOM - Arceuthobium pusillum Pk.

N.S.- A few specimens of witches' broom were collected on a

single red spruce (P. rubra) at Lily Lake near Tremont on Aug. 6.

NEEDLE RUST - Perdermium spp.
P.E.I.- Needle rust heavily infected spruce in Queens county; it caused slight damage to P. pungens.

ENGLISH WALNUT (Juglans)

BACTERIAL BLIGHT - Pseudomonas Juglandis Pierce
B.C.- Bacterial blight was general on English walnut trees at the Experimental Station, Saanichton. About 20% of the crop was lost.

WILLOW (Salix)

TAR SPOT - Rhytisma salicinum (Pers.) Fr.
P.E.I.- A slight infection of tar spot was reported by Mr. Blythe Hurst Sr. from Brackley Beach.

SCAB - Fusicladium saliciperdum (All. & Tub.) Tub.
N.B.- Scab was widespread and the damage was severe in the St. John River valley. (D.J. MacLeod)
It caused slight defoliation of S. pentandra at Loggieville. This is the most severe infection I have ever observed on this species. (K.A.Harrison)
P.E.I.- Scab caused severe damage in Queens county.

POWDERY MILDEW - Uncinula Salicis (DC.) Wint.
P.E.I.- Powdery mildew moderately infected willows in Queens county.

VI. DISEASES OF ORNAMENTAL PLANTS

BARBERRY (Berberis)

Pycnia of stem rust (Puccinia graminis Pers.) were mature on May 13, at Macdonald College, Que., and the vicinity, on both common and purple barberry, the leaves of which were two-thirds grown. The aecia were mature on June 2. The infections were larger and more numerous than last year.

BUCKTHORN (Rhamnus)

A hedge of buckthorn at Boissevain, Man., was severely infected by rust (Puccinia coronata Corda var. Avenae Erikss. & Henn.).

A few leaves were found infected with rust at Ottawa, Ont., on June 10. The aecia were well developed and shedding spores.

Infections of rust were observed at Macdonald College, Que., on May 17, when the leaves were ½ to ¾ inches long. The pycnia were mature on May 25 and the aecia on June 6. The infection spots were larger than last year.

CALENDULA

Ninety per cent of the calendula were severely damaged by yellows in a border at the Experimental Station, Fredericton, N.B.

CARAGANA

Leaf spot (Septoria Caraganae (Jacz.) Died.) lightly to moderately infected many caragana hedges in Edmonton, Alta., and caused slight premature leaf drop.

Although leaf spot was first observed on a hedge at the University, Saskatoon, Sask., on July 21 and it was common on caragana on Aug. 21, it did not become epidemic until after the drought was broken by rains in September. The rapid development of the disease at that time came too late to hasten leaf-fall appreciably.

CARNATION (Dianthus)

Anther smut (Ustilago violacea (Pers.) Fuck.) was found on cultivated carnations in a greenhouse in Toronto, Ont., on Oct. 25, by Mr. D.F. Putman, University of Toronto. Later affected specimens were also sent by Mr. F. Thomas from the same greenhouse. Two varieties, one white and one red were smutted. The infected plants lack vigour for the first four or five months after they are planted on the greenhouse bench and the blooms are dwarfed. Dr. John A. Stevenson, Bureau of Plant Industry, U.S.D.A., Washington, D.C., stated in a letter that he could find no authentic record of the occurrence of this smut on cultivated carnation in the United States and, as far as I am aware, this is the first report of its occurrence in Canada.

Apparently it is a disease of minor importance on this host in Europe. (I.L. Conners)

Rust (Uromyces caryophyllinus (Schrank.) Wint.) moderately infected stock brought into the greenhouse for forcing for the fall trade at Toronto, Ont. The rust slightly infected carnation in the Horticultural greenhouses, Central Experimental Farm, Ottawa.

Carnations were slighly infected by rust in the greenhouses at the Experimental Farm, Fredericton, N.B.

A stem rot caused by nematodes (Tylenchus sp.) was found in a greenhouse in Toronto, Ont.

CENTAUREA

Powdery mildew (Erysiphe Cichoracearum DC.) was prevalent on various varieties of centaurea in a garden in Lincoln county, Ont. The plants were dwarfed.

CHINA ASTER (Callistephus)

Wilt (Fusarium conglutinans Woll. var. Callistephi Beach) caused moderate to heavy damage in several gardens at Edmonton, Alta.

Powdery mildew (Erysiphe Cichoracearum DC.) was found on a few plants at the Experimental Station, Summerland, B.C.

Yellows (virus) was observed in several gardens in Edmonton, Alta.

A trace of yellows was present in gardens in Saskatoon, Sask.

Yellows was widespread and severe at the Experimental Station, Fredericton, N.B.; 60 to 85% of the plants were affected depending on the variety.

Yellows is so prevalent in all parts of Prince Edward Island that a garden of china asters is seldom free of the disease, and it is not unusual to find every plant infected.

CHRYSANTHEMUM

Powdery mildew (Oidium Chrysanthemi Rabh.) was common in many gardens on Vancouver island, B.C.

Three per cent of the plants were affected with powdery mildew in a greenhouse in Fredericton, N.B.

CLEMATIS (C. ligusticifolia)

Clematis affected with mosaic (virus) was found at Cache Creek, B.C.

Septoria leaf spot (S. Clematidis Rabh.) was general at Morden, Man., on Aug. 17. The damage was moderate.

COLUMBINE (Aquilegia)

Powdery mildew (Erysiphe Polygoni DC.) slightly infected columbine in York county, N.B.

COREOPSIS

Two plants were found severely infected by virus at the Experimental Station, Fredericton, N.B.

DAHLIA

Powdery mildew (Erysiphe Cichoraoearum DC.) was found on dahlia at Fredericton, N.B.

A tuber rot of bacterial origin was found in two lots of dahlia at the Experimental Station, Fredericton, N.B.

Stunt (virus) severely affected a dozen plants in a private garden in Montreal, Que.

Mosaic (virus) affected many varieties of dahlias at Charlottetown, P.E.I.

DWARF MARIGOLD (Tagetes pumila)

Blight (Botrytis sp. of B. cinerea type) was fairly general on dwarf marigold at Saanichton, B.C. Five per cent of the bloom were destroyed.

EVERLASTING (Helichrysum)

Ten per cent of the everlasting plants were affected by yellows (virus) at the Experimental Station, Fredericton, N.B.

FIRE THORN (Pyracantha)

Scab (Fusicladium Pyracanthae Otth) severely infected a few bushes in the Fraser valley, B.C.

FLOWERING CRAB (Pyrus ioensis)

Fire blight (Bacillus amylovorus (Burr.) Trev.) quite generally infected the flowering crabapple trees in the ornamental gardens at the Parliament Buildings, Regina, Sask. (G.E. Woolliams) (See also the reports of fire blight in Saskatchewan under apple and plum)

GAILLARDIA

A slight infection of smut (Entyloma polysporum (Pk.) Farl.) was reported from Winnipeg and Virden, Man.

A trace of yellows (virus) was found in gaillardia at Fredericton, N.B.

GARDEN HELIOTROPE (Valeriana officinale)

A trace of crown rot (Rhizoctonia Solani Kühn) was found on garden heliotrope at Saskatoon, Sask.

GERANIUM (Pelargonium)

Basal stem rot (Pythium sp. of P. de Baryanum group) caused moderate damage to young plants in a greenhouse at Saskatoon, Sask. in February. The cuttings were then 3 to 6 inches high.

They had been rooted in sand in October, later they were transferred to smaller pots and kept fairly cool. (T.C. Vanterpool)

Damping-off (Pythium sp.) very severely infected cuttings in a greenhouse at Charlottetown, P.E.I., in October.

Blight (Botrytis sp. of the B. cinerea type) was very destructive to several excellent varieties grown in the greenhouses in Queens county, P.E.I. It was also observed occasionally in gardens and it was reported a few times on house plants.

GLADIOLUS

Hard rot (Septoria Gladioli Pass.) affected 20% of the plants of Orange Brilliant in a garden at Fredericton, N.B.

Dry rot (Sclerotinia Gladioli Drayton) was prevalent in Edmonton, Alta., and the vicinity; the damage was moderate.

Scab (Bacterium (Pseudomonas) marginatum McCull.) was present in several commercial plots of gladiolus; the loss was about 0.5%.

A trace of scab was found in the corms, grown at the Experimental Station, Fredericton, N.B.

Scab frequently caused very severe damage to gladioli where the corms were not treated in Prince Edward Island.

Bacterium (Pseudomonas) gummisudans McCull., the cause of bacterial blight, was isolated from corms grown at Brantford, Ont., in 1932. The cankered areas on the corms were more diffuse than those of scab and it was stated that the foliage had been covered with much gummy exudate from the lesions while the plants were growing in the garden. The damage was severe. (D.H. Jones). Although the above is the first report of this disease to the Survey, Drayton (Rept. Dominion Botanist for 1927, p. 28. 1928) found it in 2 plantations at Kitchener, Ont., in 1927.

Storage rot (Penicillium Gladioli McCull. & Thom) was reported as very severe on stored bulbs at Washago, Ont. The organism was isolated. (D.H. Jones)

Mosaic (virus) affected a few plants of the variety "Allspice" at the Agricultural College, Winnipeg, Man. (G.R. Bisby)

Root rot (Cause undetermined) was very destructive in Prince Edward Island. The extreme drought may have been the cause, but the unusual symptom was the scarcity of the roots on the new corms. In addition, the ones that were still present were dead at their tips, and that part of each root near the corm bore distinct lesions. The striking symptom in the field was the drying up and death of the leaves, but there were no

lesions on the corms, cormels, or corm scales. (R.R. Hurst & F.L. Drayton)

GOLDENGLOW (Rudbeckia laciniata)

Powdery mildew (Erysiphe Cichoraceearum DC.) was found on goldenglow in a garden at Fredericton, N.B.

HOLLY (Ilex)

Tar spot (Rhytisma sp.) killed a few leaves on bushes at Saanichton, B.C.

HOLLYHOCK

Rust (Puccinia Malvaceearum Bert.) was observed only occasionally at Summerland, B.C.

Hollyhock rust first appeared at the Agricultural College, Winnipeg, Man., in the autumn of 1932; it was found again on June 9, 1933 and became very prevalent during the season. (G.R. Bisby)

Rust was prevalent on hollyhock in Lincoln county, Ont.; it caused some defoliation.

Rust was prevalent in the Montreal district, Que., but in general heavy infection came too late to injure the plant. At Macdonald College some plants were killed by rust, while in Kamouraska county the plants did not develop to their normal size and height on account of the disease.

Hollyhock rust was common in York county, N.B.; it caused severe damage in a garden in Fredericton.

Rust was observed in a small garden at Kentville, N.S.

This rust appeared on both double and single varieties of hollyhock, causing defoliation and unsightly appearing plants in Prince Edward Island. It attacked even some of the strains we had selected for resistance to rust. (R.R. Hurst)

Leaf spot (Septoria malvicola Ell. & Martin) was severe on cultivated hollyhocks at Morden, Man., on June 3.

HONEYSUCKLE (Lonicera)

Powdery mildew (Microsphaera Alni (Wallr.) Salm.) was found on one plant in August at the Experimental Station, Fredericton, N.B.

IRIS

Leaf spot (Didymellina macrospora Kleb. (Heterosporium gracile Sacc.) was reported as follows: general on Vancouver island and the Fraser valley, B.C., causing moderate damage; present in a few gardens at Summerland, B.C., where heavy irrigation was practised; slight infection in the University gardens, Saskatoon, Sask.; less than usual at Winnipeg, Man.; slight infection on an iris planting in Lincoln county, Ont.; first observed on June 2, at Macdonald College, Que., by September infection generally severe; slight damage apparent at

Kentivlle, N.S.; slight to severe infections in August in Queens county, P.E.I.

Rhizome rot (Bacillus carotovorus L.R.Jones) caused moderate to severe damage to iris in Alberta to judge by the specimens and inquiries received.

This rot caused severe damage to iris rhizomes at Sarnia and Whitby, Ont., in June.

Rhizome rot was very destructive in August and September in Queens county, P.E.I.

Bulb rot (Penicillium sp.) caused considerable damage in the field on one bulbous iris variety at Saanichton, B.C.

LARKSPUR (Delphinium)

Powdery mildew (Erysiphe Polygoni DC.) was general on Vancouver island and in the Fraser valley, B.C.; it caused slight defoliation.

Powdery mildew varied from moderate to severe on the leaves on the lower half of the plants at Saskatoon, Sask., in September.

This disease was prevalent in a garden in Wentworth county, Ont.; it caused some dwarfing of the plants.

Powdery mildew was common in gardens in York and Sunbury counties, N.B.

It caused slight damage to larkspur at Kentville, N.S.

Bacterial blight (Pseudomonas Delphinii (E.F. Sm.) Stapp) was common in York county, N.B. One specimen was received from Sussex.

Bacterial blight affected 16% of the plants at the Experimental Station, Charlottetown, P.E.I.; diseased plants were severely damaged.

LILAC (Syringa)

Little powdery mildew (Microsphaera Alni (Wallr.) Salm.) appeared on lilac at Macdonald College, Que., and infection was moderate in the Montreal district.

Powdery mildew was found on one tree at the Experimental Station, Fredericton, N.B., on Sept. 2.

Traces of powdery mildew were reported from Queens county, P.E.I.

What may have been bacterial blight (Pseudomonas Syringae) van Hall) caused a trace of damage to the twigs of lilac at Saskatoon, Sask. It was most conspicuous on the shaded inner portions of the foliage.

LILY (Lilium)

Blight (Botrytis elliptica (Berk.) Cke.) completely destroyed some plants of L. Hansonii in Queens county, P.E.I.

LUPINE (Lupinus)

Powdery mildew (Erysiphe Polygoni DC.) was common on cultivated lupine on Vancouver island, B.C.

MALLOW (Malva)

Rust (Puccinia Malvacearum Bert.) was very heavy on a cultivated mallow in a garden at Winnipeg, Man., on Oct. 10, 1933, while only a trace was present on the adjacent hollyhocks.

MARIGOLD (Tagetes)

Yellows (virus) was found affecting a single specimen of marigold in a garden at Saskatoon. China aster yellows was present in an adjoining garden. (T.C. Vanterpool)

A trace of yellows was found on marigold in a garden at the Experimental Station, Fredericton, N.B.

Wilt (Sclerotinia Sclerotiorum (Lib.) de Bary) destroyed several plants at Kentville, N.S.

NARCISSUS

Leaf scorch (Stagonospora Curtisii (Berk.)Sacc.) was found in several commercial plantings on Vancouver island, B.C., but the infection was only slight.

Smoulder (Botrytis narcissicola Kleb.) was present in most fields on Vancouver island, B.C.; it caused about 5% damage to the foliage.

This disease caused the complete loss of a lot of Victoria (N. bicolor) in St. Catharines, Ont.

Eelworms (Tylenchus dipsaci (Kühn) Bast.) were prevalent in all varieties of narcissus on Vancouver island, B.C. In some fields up to 50% of the crop was lost. King Alfred appeared to be particularly susceptible, while Golden Spur was fairly resistant. The hot water treatment is gradually being adopted by the growers.

PEONY (Paeonia)

Leaf blotch (Cladosporium Paeoniae Pass.) affected about 90% of the plants at Metchosin, B.C. It caused some premature defoliation.

Several varieties were severely damaged by leaf blotch at Macdonald College, Que., in September.

Blight (Botrytis Paeoniae Oud.) was severe at Morden, Man. on June 5.

Some varieties failed to produce any bloom on account of blight in Kamouraska county, Que.

Blight was found on 7 plants at the Experimental Station, Fredericton, N.B.

Four plants were affected by blight in a garden at Steam Mill Village, N.S.

Blight affected 65% of the plants in a new bed of peonies in Queens county, P.E.I.; it destroyed many vigorous plants.

Mosaic (virus) was observed in 2 plants in a garden at Winnipeg, Man.

The ringspot markings of mosaic were found on 14 plants at the Experimental Station, Fredericton, N.B.

Mosaic was seen in one plant at Kentville, N.S.

PETUNIA

Late blight was found on a single petunia plant at Charlottetown, P.E.I., in September. (R.R. Hurst)

PHLOX

Powdery mildew (Erysiphe Cichoracearum DC.) was general in many gardens and destructive in a few in the Summerland and Penticton districts, B.C.

This disease was prevalent in September on phlox in Lincoln county, Ont.; it caused some defoliation.

A heavy infection of powdery mildew was observed at Ormstown, Que.

Yellows (virus) was common on phlox in York county and one affected specimen was received from Charlotte county, N.B.

RED CEDAR (Juniperus)

A single specimen of Gymnosporangium globosum Farl. from a specimen tree was received from Almonte, Ont. This rust was prevalent on some of the susceptible species in the Arboretum, Central Experimental Farm, Ottawa.

RHODODENDRON

Leaf spot (Coryneum Rhododendri Schw.) was general on several plants at Agassiz, B.C.

ROSE (Rosa)

A trace of rust (Phragmidium spp.) was found on several varieties including Carmen, in the University gardens, Saskatoon, Sask.

Rust was prevalent on rose in a garden in Lincoln country, Ont.; it caused the death of some of the leaves.

Rust severely infected several specimens of wild rose in June and it was also observed on cultivated roses in September at Macdonald College, Que.

Rust was common in Westmoreland, Queens, Sunbury, Carleton and York counties, N.B.

Rust infection varied widely on the different varieties of cultivated roses grown at Charlottetown, P.E.I., as the following list shows: severe - Star of Waltham, Louise Creté, Mme. Gabriel Luizet, John Hopper, General Jacqueminot; moderate - Captain Hayward, Mabel Morrison, Duke of Edinburgh, Victor Verdier, Mme.

Caroline Testout, Lady Ashtown, Gruss an Teplitz, Mrs. R.G. Sharman-Crawford, Magna Charta, Mrs. Bertram J. Walker, Alfred K. Williams, Baroness Rothschild, Alfred Colomb; free - Frau Karl Druschki, Margaret Dixon, Killarney, Lieutenant Chauré, Richmond, Limburgia, Betty, and Edel.

Powdery mildew (Sphaerotheca pannosa (Wallr.) Lév.) was general on climbers and standard roses on shallow soil at Summerland and Penticton, B.C., but it was not often serious. It was also general on Vancouver island.

Powdery mildew was generally widespread and prevalent on various varieties in Lincoln county, Ont.

This disease slightly infected roses, principally the climbing varieties at Macdonald College, Que. Infection was less than last year.

A trace of powdery mildew was found at Sackville, N.B.

Powdery mildew caused severe damage to Pauls Scarlet and Dorothy Perkins at Charlottetown, P.E.I.

Black spot (Diplocarpon Rosae Wolf (Marssonina Rosae (Lib.) Died.) caused slight defoliation of Persian, a yellow variety, in the University gardens, Saskatoon, Sask. It was also present at Indian Head.

Black spot was reported by correspondents as injurious in some localities in Manitoba.

This disease was prevalent and caused some defoliation of Claudeus Pernet, Shot Silk, Mme. Edouard Herriot, Mme. Butterfly and Christine at the Laboratory garden, St. Catharines, Ont.

Light to moderate infections of black spot were seen in many places in the Montreal district, Que.

A trace of black spot was present at the Experimental Station, Fredericton, N.B.

SHASTA DAISY (Chrysanthemum maximum)

Leaf spot (Septoria chrysanthemella Sacc.) caused some injury at the Agricultural College, Winnipeg, Man.

SNAPDRAGON (Antirrhinum)

Rust (Puccinia Antirrhini Diet. & Holw.) is common in the Duncan district, B.C.; the plants were moderately infected. It was also found on specimens from Kamloops.

Rust is fairly common at Edmonton, Alta. Plants were being killed in one garden.

Snapdragons were moderately infected in Lincoln county, Ont.

In several gardens at Kentville, N.S., the plants were severely infected, and in some, they were completely defoliated.

Leaf spot (Phyllosticta Antirrhini Syd.) was found on a few plants at Saanichton, B.C. The spot is usually associated with rust.

SNOWBERRY (Symphoricarpos)

Specimens affected with Sphaceloma Symphoricarpi Barrus & Horsf., were collected at Stanstead, Que. It caused premature defoliation of the bushes. (H.N. Racicot)

STATICE

A trace of yellows (virus) was present on statice at the Experimental Station, Fredericton, N.B.

SWEET PEA (Lathyrus odoratus)

Powdery mildew (Microsphaera diffusa Cke. & Pk.) moderately to severely infected the lower half of sweet pea plants at Saskatoon, Sask., in September.

This disease was severe at Winnipeg, Man., in 1933.

Powdery mildew was found at Fredericton and Sackville, N.B.

This disease was very common in local gardens in Queens county, N.S. this year and caused severe damage in many.

Root rot (Rhizoctonia Solani Kühn) was severe in 2 gardens in Saskatoon, Sask. Sweet pea root disease was conspicuously less prevalent than last year. It was also found on a specimen received from Regina.

Bud drop (cause undetermined) caused severe damage in some gardens in Charlottetown, P.E.I.

SWEET SULTAN (Centaurea moschata)

Yellows (virus) affected 3% of the plants in a garden in Fredericton, N.B.

TULIP (Tulipa)

Bulb rot (Penicillium sp.) caused slight damage to tulips in the Station garden, Charlottetown, P.E.I.

Blight (Botrytis Tulipae (Lib.) Lind) was not as serious this year as last on Vancouver island, B.C., primarily on account of the dry weather and partly due to the adoption of more effective control measures.

This disease was rather injurious in a shipment of tulips to Winnipeg, Man., from Ontario.

Blight was less destructive than usual at Charlottetown, P.E.I.; infection ranging from a trace to 15%.

Basal rot (Fusarium sp.) destroyed 50% of the plants of Allard Pierson in a greenhouse at Niagara Falls, Ont., in February. (G.C. Chamberlain)

Breaking (virus) was observed in tulips at Salmon Arm, B.C.

YUCCA

Coniothyrium concentricum (Desm.) Sacc. infected several plants in a greenhouse at Kentville, N.S.; one plant was severely damaged.

ZINNIA

A trace of yellows (virus) was found on zinnia in a garden at the Experimental Station, Fredericton, N.B.

Wilt (*Fusarium* sp.) was observed on zinnia at Summerland, B.C.

CHECK LIST OF DISEASES OF FOREST AND SHADE TREES

A.W. McCallum

In order to have for convenient reference a check list of the principal fungi which cause disease in trees in Canada, the present work was undertaken. This list is based partly on specimens which are in the herbarium of the Division of Botany at Ottawa, and partly on references in literature. Species marked with an asterisk are not known to occur in Canada but, in most cases, it is probable that they are present here and will be reported in the future. This list will be revised periodically and, in this connection, the writer would appreciate being advised of any corrections which should be made in it as it stands, or of new records which should be added in future. The latter should be supported by specimens.

No attempt has been made to include all parasitic fungi, nor are all tree species listed. Only the more important of each are treated. However, the conifers are all included because of their commercial importance and because the pathology of this group is much better known than that of the deciduous or broad-leaved trees. The dwarf mistletoes have been listed for their respective hosts, but diseases due to non-organic agencies have been omitted.

In the matter of citation of fungi, the rules of the International Botanical Congress have been taken as a guide.

Where Fries accepts the specific name of a pre-Friesian author, the latter, without reference to Fries, is quoted as the authority. For example, instead of writing Fomes officinalis (Vill. ex Fr.) Faull, it is written Fomes officinalis (Vill.) Faull. In regard to trees the nomenclature and citation of Rehder was adopted except for the genus Populus.

CONIFERS

WHITE PINE (Pinus strobus L.)

Trunk and roots:	Trametes Pini (Thore) Fr.
	Fomes officinalis (Vill.) Faull
	Polyporus Schweinitzii Fr.
	Polyporus circinatus Fr.
Trunk and branches:	Cronartium ribicola Fisch.
	Cenangium Abietis (Pers.) Duby*
Foliage:	Bifusella linearis (Pk.) v. Höhnel*
	Hypoderma Desmazierii Duby
	Lophodermium pinastri (Schrad.) Chev.
	Lophodermium nitens Darker

WESTERN WHITE PINE (Pinus monticola Dougl.)

Roots:	Sparassis radicata Weir*
Trunk and roots:	Trametes Pini (Thore) Fr.
	Fomes annosus (Fr.) Cke.*
	Fomes officinalis (Vill.) Faull
	Polyporus sulphureus (Bull.) Fr.
	Polyporus circinatus Fr.*
	Polyporus Schweinitzii Fr.
Trunk and branches:	Dasyscypha fusco-sanguinea Rehm
	Dasyscypha Agassizii (B. and C.) Sacc.
	Atropellis pinicola Zeller and Gooding
	Cronartium ribicola Fisch.
Foliage:	Bifusella linearis (Pk.) v. Höhnel
	Neopeckia Coulteri (Pk.) Sacc.*
	Lophodermium nitens Darker*

LIMBER PINE (Pinus flexilis James)

Trunk and branches:	Cronartium ribicola Fisch.
Foliage:	Dasyscypha fusco-sanguinea Rehm*
	Neopeckia Coulteri (Pk.) Sacc.*

WHITE-BARKED PINE (Pinus albicaulis Engelm.

Trunk and branches:	Cronartium ribicola Fisch.
	Dasyscypha fusco-sanguinea Rehm*
Foliage:	Neopeckia Coulteri (Pk.) Sacc.*
	Lophodermium nitens Darker*

RED PINE (Pinus resinosa Ait.

Trunk and roots:	Trametes Pini (Thore) Fr.
	Polyporus Schweinitzii Fr.
	Polyporus circinatus Fr.*
Trunk and branches:	Cronartium Quercuum Miyabe
	Cronartium Comptoniae Arth.*
Foliage:	Coleosporium Solidaginis (Schw.) Thüm.

JACK PINE (Pinus Banksiana Lam.)

Trunk and roots:	Trametes Pini (Thore) Fr.
	Polyporus Schweinitzii Fr.
	Polyporus circinatus Fr.*
Trunk and branches:	Cronartium Quercuum Miyabe
	Cronartium Comptoniae Arth.
	Cronartium Comandrae Pk.
Foliage:	Coleosporium Solidaginis (Schw.) Thüm.
	Hypoderma Desmazierii Duby
	Elytroderma deformans (Weir) Darker
	Hypodermella ampla (Davis) Dearn.
	Hypodermella concolor (Dearn.) Darker
	Lophodermium pinastri (Schrad.) Chev.
	Naemacyclus niveus (Pers.) Sacc.

PITCH PINE (Pinus rigida Mill.)

Trunk and roots:	Trametes Pini (Thore) Fr.*
	Polyporus Schweinitzii Fr.*
Foliage:	Coleosporium Solidaginis (Schw.) Thüm.*
	Cronartium Quercuum Miyabe*
	Cronartium Comptoniae Arth.*
	Hypoderma lethale Dearn.*
	Lophodermium pinastri (Schrad.) Chev.*

WESTERN YELLOW PINE (Pinus ponderosa Dougl.)

Trunk and roots:	Trametes Pini (Thore) Fr.
	Polyporus Schweinitzii Fr.
	Fomes officinalis (Vill.) Faull
	Polyporus anceps Pk.
Trunk and branches:	Cronartium Comandrae Pk.
	Cronartium Comptoniae Arth.*
	Cenangium Abietis (Pers.) Duby*
	Cenangium piniphilum Weir*
	Razoumofskya campylopoda (Engelm.) Piper
Foliage:	Elytroderma deformans (Weir) Darker
	Lophodermium pinastri (Schrad.) Chev.*
	Neopeckia Coulteri (Pk.) Sacc.*
	Cronartium Harknessii (Moore) Meinecke

LODGEPOLE PINE (Pinus contorta Dougl.)

Trunk and roots:	Trametes Pini (Thore) Fr.
	Polyporus Schweinitzii Fr.*
	Fomes officinalis (Vill.) Faull*
Trunk and branches:	Cronartium Harknessii (Moore) Meinecke
	Cronartium Comandrae Pk.
	Cenangium Abietis (Pers.) Duby*
	Cenangium piniphilum Weir*
	Atropellis pinicola Zeller and Gooding*
	Dasyscypha arida Phil.*
	Razoumofskya americana (Nutt.) Kuntze
Foliage:	Elytroderma deformans (Weir) Darker
	Hypodermella concolor (Dearn.) Darker
	Hypodermella montana Darker*
	Hypodermella montivaga (Petrak) Dearn.*
	Lophodermium pinastri (Schrad.) Chev.
	Coleosporium Solidaginis (Schw.) Thum.
	Cronartium Comptoniae Arth.
	Neopeckia Coulteri (Pk.) Sacc.*

TAMARACK (Larix laricina K. Koch)

Trunk and roots:	Trametes Pini (Thore) Fr.*
	Fomes officinalis (Vill.) Faull*
Foliage:	Melampsora Medusae Thüm.
	Melampsora Bigelowii Thüm.
	Melampsoridium Betulae (Schum.) Arth.*
	Hypodermella Laricis v. Tubeuf
	Lophodermium laricinum Duby

WESTERN LARCH (*Larix occidentalis* Nutt.)

Roots:	*Sparassis radicata* Weir*
Trunk and roots:	*Fomes officinalis* (Vill.) Faull
	Polyporus sulphureus (Bull.) Fr.
	Polyporus Schweinitzii Fr.
	Trametes Pini (Thore) Fr.
	Polyporus circinatus Fr.*
Trunk and branches:	*Razoumofskya Laricis* Piper
Foliage:	*Melampsora Medusae* Thum.*
	Melampsora Bigelowii Thum.
	Hypodermella Laricis v. Tubeuf

ALPINE LARCH (*Larix Lyallii* Parl.)

Trunk and roots:	*Trametes Pini* (Thore) Fr.*
	Polyporus Schweinitzii Fr.*
Foliage:	*Melampsora Medusae* Thum.*
	Melampsora Bigelowii Thum.*

BLACK SPRUCE (*Picea mariana* B.S.P.)

Trunk and roots:	*Trametes Pini* (Thore) Fr.
	Polyposus Schweinitzii Fr.
	Polyporus circinatus Fr.
	Polyporus circinatus Fr. var. *dualis* (Pk.) Overholts
	Armillaria mellea (Vahl) Sacc.
	Poria subacida Pk.
Trunk and branches:	*Arceuthobium pusillum* Pk.
Foliage:	*Chrysomyxa ledicola* Lagerh.
	Chrysomyxa Pirolae Rostr.
	Chrysomyxa Ledi deBary
	Chrysomyxa Cassandrae Tranz.
	Peridermium coloradense (Diet.) A. and K.
	Bifusella crepidiformis Darker
	Lophodermium filiforme Darker
	Lophodermium Piceae (Fuckel) v. Höhnel
	Phacidium infestans Karst.
	Herpotrichia nigra Hartig

RED SPRUCE (*Picea rubra* Link)

Trunk and roots:	*Trametes Pini* (Thore) Fr.*
	Polyporus Schweinitzii Fr.*
	Polyporus circinatus Fr.*
	Polyporus circinatus Fr. var. *dualis* (Pk.) Overholts*
	Poria subacida Pk.*

RED SPRUCE (*Picea rubra* Link) - Cont'd.

Foliage:	*Chrysomyxa ledicola* Lagerh.
	Chrysomyxa Pirolae Rostr.
	Chrysomyxa Ledi deBary
	Chrysomyxa Cassandrae Tranz.
	Peridermium coloradense (Diet.) A. and K.*
	Lophodermium Piceae (Fuckel) v. Höhnel*
	Phacidium infestans Karst.

WHITE SPRUCE (*Picea glauca* Voss)

Trunk and roots:	*Trametes Pini* (Thore) Fr.
	Polyporus balsameus Pk.
	Polyporus Schweinitzii Fr.
	Polyporus circinatus Fr.
	Polyporus circinatus Fr. var. *dualis* (Pk.) Overholts
	Poria subacida Pk.
Foliage:	*Chrysomyxa ledicola* Lagerh
	Chrysomyxa Pirolae Rostr.
	Peridermium coloradense (Diet.) A. and K.
	Peridermium ingenuum Arth.*
	Bifusella crepidiformis Darker
	Lophodermium filiforme Darker
	Lophodermium Piceae (Fuckel) v. Höhnel
	Phacidium infestans Karst.
	Herpotrichia nigra Hartig

ENGELMANN SPRUCE (*Picea Engelmanni* Engelm.)

Roots:	*Sparassis radicata* Weir*
Trunk and roots:	*Trametes Pini* (Thore) Fr.
	Fomes officinalis (Vill.) Faull
	Polyporus Schweinitzii Fr.
	Echinodontium tinctorium E. and E.
	Polyporus circinatus Fr.*
	Fomes annosus (Fr.) Cke.*
Foliage:	*Chrysomyxa ledicola* Lagerh.
	Chrysomyxa Pirolae Rostr.*
	Chrysomyxa Weirii Jackson
	Peridermium coloradense (Diet.) A. and K.
	Lophodermium Piceae (Fuckel) v. Höhnel
	Herpotrichia nigra Hartig*

SITKA SPRUCE (Picea sitchensis Carr.)

Trunk and roots:	Trametes Pini (Thore) Fr.
	Polyporus Schweinitzii Fr.
Foliage:	Chrysomyxa ledicola Lagerh.*
	Peridermium coloradense (Diet.) A. and K.
	Lophodermium Piceae (Fuckel) v. Höhnel*

HEMLOCK (Tsuga canadensis Carr.)

Trunk and roots:	Polyporus borealis Fr.
	Polyporus circinatus Fr.
	Polyporus Schweinitzii Fr.*
Foliage:	Melampsora Abietis-canadensis (Farl.) Ludwig
	Pucciniastrum Myrtilli (Schum.) Arth.
	Necium Farlowii Arth.*
	Keithia Tsugae (Farl.) Durand*

WESTERN HEMLOCK (Tsuga heterophylla Sarg.)

Trunk and roots:	Echinodontium tinctorium E. and E.
	Trametes Pini (Thore) Fr.
	Polyporus Schweinitzii Fr.
	Fomes officinalis (Vill.) Faull
	Fomes annosus (Fr.) Cke.*
	Polyporus circinatus Fr.
Trunk and branches:	Razoumofskya tsugensis Rosend.
Foliage:	Melampsora Abietis-candensis (Farl.) Ludwig*
	Uredo Holwayi Arth.
	Caeoma dubium Ludwig*
	Herpotrichia nigra Hartig*

BLACK HEMLOCK (Tsuga Mertensiana Sarg.)

Trunk and roots:	Echinodontium tinctorium E. and E.*
	Fomes officinalis (Vill.) Faull*
	Trametes Pini (Thore) Fr.*
Foliage:	Uredo Holwayi Arth.
	Herpotrichia nigra Hartig*

DOUGLAS FIR (*Pseudotsuga taxifolia* Brit.)

Roots:	*Sparassis radicata* Weir*
Trunk and roots	*Trametes Pini* (Thore) Fr.
	Fomes officinalis (Vill.) Faull
	Polyporus Schweinitzii Fr.
	Polyporus sulphureus (Bull.) Fr.
	Fomes roseus (A. and S.) Cke.
	Fomes annosus (Fr.) Cke.
	Armillaria mellea (Vahl) Sacc.
	Polyporus circinatus Fr.*
Trunk and branches:	*Razoumofskya Douglasii* (Engelm.) Kuntze
Foliage:	*Melampsora albertensis* Arth.
	Rhabdocline Pseudotsugae Syd.
	Phacidium infestans Karst. var. *Abietis* Dearn.
	Herpotrichia nigra Hartig*

BALSAM FIR (*Abies balsamea* Mill.)

Trunk and roots	*Polyposus balsameus* Pk.
	Poria subacida Pk.
	Stereum sanguinolentum A. and S.
Foliage	*Melampsora americana* Arth.
	Melampsorella elatina (A. and S.) Arth.
	Pucciniastrum Abieti-Chamaenerii Kleb.
	Pucciniastrum Epilobii (Pers.) Otth
	Calyptospora Goeppertiana J. Kühn
	Hyalopsora Aspidiotus (Pk.) P. Magn.
	Milesia marginalis Faull and Watson
	Milesia intermedia Faull
	Milesia polypodophila (Bell) Faull
	Uredinopsis Atkinsonii P. Magn.
	Uredinopsis Osmundae Magn.
	Uredinopsis americana Syd.
	Uredinopsis Phegopteridis Arth.
	Uredinopsis Struthiopteridis Störmer
	Bifusella Faullii Darker
	Hypodermella mirabilis Darker
	Hypodermella punctata Darker
	Hypodermella nervata Darker
	Lophodermium autumnale Darker
	Lophodermium lacerum Darker
	Lophodermium Piceae (Fuckel) v. Höhnel
	Phacidium infestans Karst.
	Asterina nuda Pk.
	Herpotrichia nigra Hartig

ALPINE FIR (Abies lasiocarpa Nutt.)

Trunk and roots:	Echinodontium tinctorium E. and E.
	Polyporus Schweinitzii Fr.
Branches:	Phoma abietina Hartig
Foliage:	Calyptospora Goeppertiana J. Kühn
	Melampsora americana Arth.*
	Melampsorella elatina (A. and S.) Arth.*
	Pucciniastrum Abieti-Chamaenerii Kleb.
	Pucciniastrum Epilobii (Pers.) Otth*
	Bifusella Abietis Dearn.*
	Lophodermium autumnale Darker*
	Lophodermium Piceae (Fuckel) v. Höhnel
	Herpotrichia nigra Hartig*

LOWLAND FIR (Abies grandis Lindl.)

Trunk and roots:	Polyporus Schweinitzii Fr.
	Echinodontium tinctorium E. and E.
	Trametes Pini (Thore) Fr.
	Polyporus sulphureus (Bull.) Fr.
	Fomes officinalis (Vill.) Faull
Branches:	Phoma abietina Hartig
Foliage:	Melampsora americana Arth.*
	Calyptospora Goeppertiana J. Kühn
	Melampsorella elatina (A. and S.) Arth.
	Pucciniastrum Abieti-Chamaenerii Kleb.*
	Pucciniastrum Epilobii (Pers.) Otth *
	Uredinopsis Pteridis D. and H.
	Hypoderma robustum v. Tubeuf*
	Hypodermella punctata Darker*
	Hypodermella Abietis-concoloris (Mayr) Dearn.*
	Phacidium infestans Karst. var. Abietis Dearn.*
	Herpotrichia nigra Hartig

AMABILIS FIR (Abies amabilis Forb.)

Trunk and roots:	Echinodontium tinctorium E. and E.
	Polyporus Schweinitzii Fr.
	Polyporus sulphureus (Bull.) Fr.
	Trametes Pini (Thore) Fr.
	Fomes officinalis (Vill.) Faull

AMABILIS FIR (Abies amabilis Forb.) Cont'd.

Foliage:
- Calyptospora Goeppertiana J. Kühn*
- Melampsorella elatina (A. and S.) Arth.*
- Pucciniastrum Abieti-Chamaenerii Kleb.
- Pucciniastrum Epilobii (Pers.) Otth
- Hypoderma robustum v. Tubeuf
- Hypodermella punctata Darker
- Lophodermium autumnale Darker

CEDAR (Thuja occidentalis L.)

Trunk and roots:
- Polyporus balsameus Pk.
- Polyporus Schweinitzii Fr.
- Trametes Pini (Thore) Fr.
- Poria Weirii Murr.*
- Armillaria mellea (Vahl) Sacc.

Foliage:
- Keithia thujina Durand
- Lophodermium Thujae Davis

WESTERN CEDAR (Thuja plicata Don)

Trunk and roots:
- Polyporus Schweinitzii Fr.
- Poria Weirii Murr.
- Trametes Pini (Thore) Fr.

Foliage:
- Keithia thujina Durand
- Herpotrichia nigra Hartig*

YELLOW CYPRESS (Chamaecyparis nootkatensis Sudw.)

Foliage:
- Gymnosporangium nootkatense (Trel.) Arth.

RED CEDAR (Juniperus virginiana L.)

Branches:
- Gymnosporangium Juniperi-virginianae Schw.
- Gymnosporangium globosum Farl.
- Gymnosporangium clavipes Cke. and Pk.

Foliage:
- Lophodermium juniperinum (Fr.) de Not.

WESTERN RED CEDAR (Juniperus scopulorum Sarg.)

Branches:
- Gymnosporangium Nelsoni Arth.
- Gymnosporangium juvenescens Kern

COMMON JUNIPER (Juniperus communis L.)

Branches:	Gymnosporangium clavipes Cke. and Pk.
	Gymnosporangium clavariaeforme (Jacq.) DC.
Foliage:	Lophodermium juniperinum (Fr.) de Not.

(Juniperus communis L. var. depressa Pursh.)

Branches:	Gymnosporangium clavipes Cke. and Pk.
	Gymnosporangium clavariaeforme (Jacq.) DC.
	Gymnosporangium juniperinum (L.) Mart.
	Gymnosporangium Juniperi Link
Foliage:	Lophodermium juniperinum (Fr.) de Not.

DECIDUOUS SPECIES

BLACK WALNUT (Juglans nigra L.)

Trunk:	Fomes igniarius (L.) Gill.*
	Polyporus sulphureus (Bull.) Fr.*
Foliage:	Gnomonia leptostyla (Fr.) Ces. and de Not.
	Microstroma Juglandis (Bereng.) Sacc.

BUTTERNUT (Juglans cinerea L.)

Trunk:	Fomes igniarius (L.) Gill.
	Polyporus sulphureus (Bull.) Fr.*
Foliage:	Gnomonia leptostyla (Fr.) Ces. and de Not.
	Microstroma Juglandis (Bereng.) Sacc.

BITTERNUT HICKORY (Carya cordiformis K. Koch)

Trunk:	Fomes igniarius (L.) Gill.*
Foliage:	Microstroma Juglandis (Bereng.) Sacc.*
	Gloeosporium Caryae Ell. and Dearn.

SHAGBARK HICKORY (Carya ovata K. Koch)

Trunk:	Fomes igniarius (L.) Gill.*
	Microstroma Juglandis (Bereng.) Sacc.
	Gloeosporium Caryae Ell. and Dearn.*

MOCKERNUT HICKORY (Carya alba K. Koch)

Trunk:	Fomes igniarius (L.) Gill.*
Foliage:	Microstroma Juglandis (Bereng.) Sacc.*
	Gloeosporium Caryae Ell. and Dearn.*

PIGNUT HICKORY (*Carya glabra* Sweet)

Trunk:	*Fomes igniarius* (L.) Gill.*
Foliage:	*Microstroma Juglandis* (Bereng.) Sacc.*
	Gloeosporium Caryae Ell. and Dearn.

WILLOWS (*Salix* spp.)

Trunk:	*Fomes igniarius* (L.) Gill.
Trunk and roots:	*Fomes applanatus* (Pers.) Wallr.
Trunk and branches:	*Cytospora chrysosperma* (Pers.) Fr.
Foliage:	*Melampsora Bigelowii* Thum.
	Melampsora americana Arth.
	Melampsora arctica Rostr.
	Melampsora confluens (Pers.) Jackson
	Rhytisma salicinum Fr.
	Marssonia nigricans E. and E.
	Marssonia Populi (Lib.) Magn.
	Uncinula Salicis (DC.) Wint.
	Gloeosporium Salicis West.
	Gloeosporium boreale E. and E.*
	Cylindrosporium salicinum (Pk.) Dearn.
Foliage and branches:	*Fusicladium saliciperdum* (All. and Tub.)
	Physalospora Miyabeana Fukushi Tub.

ASPEN (*Populus tremuloides* Michx.)

Trunk:	*Fomes igniarius* (L.) Gill.
	Hypoxylon pruinatum (Klot.) Cke.
Trunk and roots:	*Fomes applanatus* (Pers.) Wallr.
Trunk and branches:	*Cytospora chrysosperma* (Pers.) Fr.
	Cenangium populneum (Pers.) Rehm
Foliage:	*Melampsora Abietis-canadensis* (Farl.) Ludw.
	Melampsora albertensis Arth.
	Melampsora Medusae Thum.
	Septoria musiva Pk.
	Fusicladium radiosum (Lib.) Lind
	Cladosporium subsessile E. and B.
	Septogloeum rhopaloideum Dearn. and Bisby
	Uncinula Salicis (DC.) Wint.
	Sclerotium bifrons E. and E.
	Marssonia Populi (Lib.) Magn.

LARGE-TOOTHED ASPEN (Populus grandidentata Michx.)

Trunk:	Fomes igniarius (L.) Gill.
	Hypoxylon pruinatum (Klot.) Cke.
Trunk and roots:	Fomes applanatus (Pers.) Wallr.
Trunk and branches:	Cytospora chrysosperma (Pers.) Fr.
Foliage:	Melampsora Abietis-canadensis (Farl.) Ludw.
	Fusicladium radiosum (Lib.) Lind
	Sclerotium bifrons E. and E.
	Marssonia Populi (Lib.) Magn.*

BALSAM POPLAR (Populus balsamifera L.)

Trunk:	Fomes igniarius (L.) Gill
	Hypoxylon pruinatum (Klot.) Cke.*
Trunk and roots	Fomes applanatus (Pers.) Wallr.
Trunk and branches:	Cytospora chrysosperma (Pers.) Fr.
Branches:	Cucurbitaria staphula Dearn.
Foliage:	Melampsora albertensis Arth.*
	Melampsora Medusae Thum.*
	Melampsora occidentalis Jackson
	Marssonia Castagnei (Desm. and Mont.) Sacc.
	Septoria populicola Pk.
	Septoria musiva Pk.
	Uncinula Salicis (DC.) Wint.
	Marssonia Populi (Lib.) Magn.*

LANCELEAF COTTONWOOD (Populas acuminata Rydb.)

Trunk:	Fomes igniarius (L.) Gill.*
Trunk and roots:	Fomes applanatus (Pers.) Wallr.*
Foliage:	Melampsora occidentalis Jackson
	Melampsora albertensis Arth.*
	Marssonia Populi (Lib.) Magn.*

NARROWLEAF COTTONWOOD (Populus angustifolia James)

Trunk:	Fomes igniarius (L.) Gill.*
Trunk and roots:	Fomes applanatus (Pers.) Wallr.*
Trunk and branches:	Cytospora chrysosperma (Pers.) Fr.*
Foliage:	Melampsora albertensis Arth.*
	Melampsora occidentalis Jackson*
	Septoria musiva Pk.*
	Uncinula Salicis (DC.) Wint.*
	Marssonia Populi (Lib.) Magn.*

COTTONWOOD (Populus deltoides Marsh.)

Trunk:	Fomes igniarius (L.) Gill.*
Trunk and roots:	Fomes applanatus (Pers.) Wallr.*
Trunk and branches:	Cytospora chrysosperma (Pers.) Fr.
	Dothichiza populea Sacc. and Briard*
Foliage:	Melampsora Medusae Thum.*
	Septoria musiva Pk.*
	Sclerotium bifrons E. and E.
	Septoria populicola Pk.*
	Marssonia Castagnei (Desm. and Mont.) Sacc.*
	Marssonia Populi (Lib.) Magn.*

BLACK COTTONWOOD (Populus trichocarpa T. and G.

Trunk:	Fomes igniarius (L.) Gill.*
Trunk and roots:	Fomes applanatus (Pers.) Wallr.*
Trunk and branches:	Cytospora chrysosperma (Pers.) Fr.*
	Dothichiza populea Sacc. and Briard*
Branches:	Macrophoma tumefaciens Shear*
Foliage:	Melampsora occidentalis Jackson
	Marssonia Castagnei (Desm. and Mont.) Sacc.*
	Septoria populicola Pk.*
	Septoria musiva Pk.
	Taphrina aurea (Pers.) Fr.*
	Marssonia Populi (Lib.) Magn.*

BALM OF GILEAD (Populus candicans Ait.)

Trunk:	Fomes igniarius (L.) Gill.*
Trunk and roots:	Fomes applanatus (Pers.) Wallr.*
Foliage:	Melampsora Abietis-canadensis (Farl.) Ludw.*
	Melampsora Medusae Thum.*
	Melampsora occidentalis Jackson*
	Marssonia Castagnei (Desm. and Mont.) Sacc.*
	Septoria populicola Pk.*
	Uncinula Salicis (DC.) Wint.*
	Marssonia Populi (Lib.) Magn.*

WHITE POPLAR (Populus alba L.)

Trunk and roots:	Fomes applanatus (Pers.) Wallr.
Trunk and branches:	Cytospora chrysosperma (Pers.) Fr.
	Dothichiza populea Sacc. and Briard*
Foliage:	Melampsora Abietis-canadensis (Farl.) Ludw.
	Marssonia Populi (Lib.) Magn.

LOMBARDY POPLAR (*Populus nigra* L. var. *italica* Du Roi)

Trunk and roots:	*Fomes applanatus* (Pers.) Wallr.
Trunk and branches:	*Cytospora chrysosperma* (Pers.) Fr.
	Dothichiza populea Sacc. and Briard
Foliage:	*Sclerotium bifrons* E. and E.
	Marssonia Populi (Lib.) Magn.*

PAPER BIRCH (*Betula papyrifera* Marsh.)

Trunk:	*Fomes fomentarius* (L.) Gill.
	Fomes igniarius (L.) Gill.
Trunk and roots:	*Fomes applanatus* (Pers.) Wallr.
Foliage:	*Melampsoridium Betulae* Arth.
	Taphrina flava Farl.

YELLOW BIRCH (*Betula lutea* Michx.)

Trunk:	*Fomes fomentarius* (L.) Gill.
	Fomes igniarius (L.) Gill.
Trunk and roots:	*Fomes applanatus* (Pers.) Wallr.
Foliage:	*Melampsoridium Betulae* Arth.*

IRONWOOD (*Ostrya virginiana* K. Koch)

Trunk:	*Fomes igniarius* (L.) Gill.
Foliage:	*Melampsoridium Carpini* (Nees) Diet.*
	Cylindrosporium Dearnessii E. and E.
	Septoria Ostryae Pk.

BLUE BEECH (*Carpinus caroliniana* Walt.)

Trunk and roots:	*Fomes applanatus* (Pers.) Wallr.
Trunk:	*Fomes igniarius* (L.) Gill.
Foliage:	*Gloeosporium carpinicolum* Ell. and Dearn.
	Gloeosporium Robergei Desm.
	Cylindrosporium Dearnessii E. and E.

BEECH (*Fagus grandifolia* Ehrh.)

Trunk and roots:	*Fomes applanatus* (Pers.) Wallr.
Trunk	*Fomes igniarius* (L.) Gill.
Foliage:	*Gloeosporium Fagi* (Desm. and Rob.) West.

CHESTNUT (*Castanea dentata* Borkh.)

Trunk and branches:	*Endothia parasitica* (Murr.) A. and A.
Foliage:	*Septogloeum ochroleucum* (B. and C.) Dearn.

WHITE OAK (*Quercus alba* L.)

Root and trunk:	*Polyporus frondosus* (Dicks.) Fr.*
	Fomes applantatus (Pers.) Wallr.*
	Polyporus sulphureus (Bull.) Fr.*
Foliage:	*Cronartium Quercuum* Miyabe*
	Taphrina caerulescens (Mont. and Desm.) Tul.
	Gnomonia veneta (Sacc.) Kleb.
	Gloeosporium quercinum West.

BUR OAK (*Quercus macrocarpa* Michx.)

Roots and trunk:	*Polyporus frondosus* (Dicks.) Fr.*
	Fomes applanatus (Pers.) Wallr.*
	Polyporus sulphureus (Bull.) Fr.*
Foliage:	*Cronartium Quercuum* Miyabe*
	Taphrina caerulescens (Mont. and Desm.) Tul.
	Gnomonia veneta (Sacc.) Kleb.

RED OAK (*Quercus rubra* L.)

Roots and trunk:	*Polyporus frondosus* (Dicks.) Fr.*
	Fomes applanatus (Pers.) Wallr.
	Fomes igniarius (L.) Gill.*
	Polyporus sulphureus (Bull.) Fr.
Foliage:	*Cronartium Quercuum* Miyabe
	Taphrina caerulescens (Mont. and Desm.) Tul.*
	Gnomonia veneta (Sacc.) Kleb.

WHITE ELM (*Ulmus americana* L.)

Root and trunk:	*Fomes applanatus* (Pers.) Wallr.
Trunk:	*Fomes igniarius* (L.) Gill
Trunk and branches:	*Graphium Ulmi* Schwarz*
Branches:	*Sphaeropsis ulmicola* E. and E.
Foliage:	*Gnomonia ulmea* (Schw.) Thum.
	Phleospora Ulmi (Fr.) Wallr.
	Gloeosporium ulmeum Miles

SUGAR MAPLE (*Acer saccharum* Marsh.)

Trunk and roots:	*Fomes applanatus* (Pers.) Wallr.
	Fomes connatus (Weinm.) Gill.
Trunk:	*Fomes igniarius* (L.) Gill.
Trunk and branches:	*Verticillium* sp.
Foliage:	*Rhytisma acerinum* (Pers.) Fr.
	Phyllosticta minima (B. and C.) E. and E.
	Gloeosporium decolorans E. and E.
	Gloeosporium apocryptum E. and E.

SILVER MAPLE (*Acer saccharinum* L.)

Trunk and roots:	*Fomes applanatus* (Pers.) Wallr.
	Fomes connatus (Weinm.) Gill.*
Trunk:	*Fomes igniarius* (L.) Gill.*
Trunk and branches:	*Verticillium* sp.
Foliage:	*Rhytisma acerinum* (Pers.) Fr.
	Phyllosticta minima (B. and C.) E. and E.*
	Gloeosporium apocryptum E. and E.*

RED MAPLE (*Acer rubrum* L.)

Trunk and roots:	*Fomes applanatus* (Pers.) Wallr.*
	Fomes connatus (Weinm.) Gill.*
Trunk:	*Fomes igniarius* (L.) Gill.*
Trunk and branches:	*Verticillium* sp.
Foliage:	*Rhytisma acerinum* (Pers.) Fr.
	Phyllosticta minima (B. and C.) E. and E.
	Gloeosporium decolorans E. and E.

BASSWOOD (*Tilia americana* L.)

Trunk and roots:	*Fomes applanatus* (Pers.) Wallr.
Trunk:	*Pholiota adiposa* Fr.*
Foliage:	*Cercospora Tiliae* Pk.
	Uncinula Clintonii Pk.

WHITE ASH (*Fraxinus americana* L.)

Trunk:	*Fomes fraxinophilus* Pk.
Foliage:	*Puccinia sparganioides* Ell. and Barth.
	Gloeosporium aridum Ell. and Holw.

BLACK ASH (*Fraxinus nigra* Marsh.)

Foliage:	*Puccinia sparganioides* Ell. and Barth.*
	Gloeosporium aridum Ell. and Holw.*

Additions to

The Fungous Flora of Manitoba II.

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

"The Fungi of Manitoba", published in 1929, listed 1,969 species of fungi exclusive of dermatophytes. The first supplement in the Canadian Plant Disease Survey Report (hereafter referred to as "P.D.S.") for 1931 recorded the addition of 142 species. This, the second supplement, adds 289 species and varieties making a total of 2,400 known in the province on Nov. 1, 1933. There are, in addition, several fungi attacking man and some of the higher animals. Dr. A.M. Davidson's preliminary list, pages 145-146 of the book, listed 20 such fungi. A revised list of fungi on man only, listing 9 species, is given in Can. Jour. Res. 7:233-235, 1932, by Drs. Davidson and Gregory.

This list follows the style of the preceding. Species marked "(n)" require further study. When no locality is given, the fungus either was found near Winnipeg, or is a soil or butter fungus in which exact locality is not known to be important. The writers are glad to acknowledge the help of experts with various species, in particular that of Dr. Irene Mounce, and of Drs. W.L. Gordon, J.E. Machacek, and other members of the Dominion Rust Research Laboratory.

The only correction of previous lists particularly requiring mention is the reference "Dasyschypha (n) Willkommii" on Pinus, P.D.S. '31, p. 109. While this fungus is morphologically somewhat like D. Willkommii, it is certainly not that injurious species of Europe.

Three publications are cited with certain species. These are:

1. G.R. Bisby, N. James and M. Timonin. Fungi isolated from Manitoba soil by the plate method. Can. Jour. Res. 8:253-275. 1933.

2. G.R. Bisby, M.C. Jamieson and M. Timonin. The fungi found in butter. Ibid. 9:97-107. 1933.

3. Eleanor Silver Dowding. Gelasinospora, a new genus of Pyrenomycetes with pitted spores. Ibid. 9:294-305. 1933.

Add to:-

Page

51. Myxococcus (n) ruber Baur. On dung.
Membranosorus Heterantherae Ost. & Pet. On Heteranthera dubia, Lake of the Woods (Zeitschr. Bot. 23:13. 1930)
Arcyria ferruginea Sauter. On Populus.
A. nutans (Bull.) Grev. On wood, Victoria Beach.
Cienkowskia reticulata (A. & S.) Rost. On wood.

52. Didymium anellus Morg. On old sunflower leaves (A. Brown).
D. xanthopus (Ditm.) Fr. On wood.

53. Physarum (n) galbeum Wing. On bark of Populus.
Stemonitis ferruginea var. violacea Meyl. On leaves.

54. Trichia favoginea (Batsch) Pers. On wood. Keewatin.

55. Saprolegnia parasitica Coker. On goldfish (P.H. Gregory).

56. Plasmopara Geranii (Pk.) Berl. & de T. On Geranium maculatum, Berens River.
P. pygmaea (Unger) Schroet. On Anemone canadensis, Cowan (J. E. Machacek).
Pythium deBaryanum var. Pelargonii H. Braun. On Pelargonium (det. T.C. Vanterpool).
Absidia glauca Hagem. In soil (1:257).
A. Orchidis (Vuill.) Hagem. In soil (1:257).
A. spinosa Lindner. In soil and butter (1:257; 2:100).
Cunninghamella verticillata Paine. In butter (2:100)
Mortierella isabellina Oud. var. ramifica Dixon-Stewart. In soil (1:257).
Mucor (n) abundans Povah. In soil (1:257).
M. circinelloides van Tiegh. In butter (2:102) and debris.
M. dispersus Hagem. In soil (1:257).
M. hiemalis Wehm. In soil (1:257).
M. spinosus Lindner. In flour, etc., in a bakery.
M. (n) sylvaticus Hagem. In soil (1:257).
Pilobolus umbonatus Buller in MS. On dung.

57. Rhizopus Cohnii Berl. & de T. In lung of chicken.
R. elegans Eidam. In soil and butter (1:257; 2:103).
R. nodosus Namysl. In butter (2:103).
Syncephalastrum racemosum Cohn. In soil (1:257).
Syncephalis nodosus van Tiegh. On Pilobolus, etc.
Zygorhynchus heterogamus Vuill. In soil (1:257).
Z. (n) Moelleri Auct. Amer. In soil (1:258).

58. Taphrina ?Alni-incanae (Kuehn) Magn. On alder catkins.
Trichoglossum tetrasporum Sind. & Fitzp. Kenora (M. Timonin).

Add to:-

Page

59. Ascophanus argenteus (Curr.) Boud. On dung.
Patella abundans (Karst.) Seaver. On burnt places, Clear Lake.

60. Peziza fimenti (Fckl.) Seaver. On dung.

62. Ciboria caucus (Rebent.) Fckl. On poplar catkins.
Godronia (n) urceolus (A.&S.) Karst. On Ribes.
Mollisia caesia (Fckl.) Sacc. On Symphoricarpos.
Orbilia (n) coccinella (Sommf.) Fr. On wood.

63. Pezizella inquilina (Karst.) Rehm. On Equisetum, Berens River.
Clithris lactea (C. & P.) E.& E. On Ledum. Berens River.

64. Sphaeropezia Vaccinii Rehm. Form on bear-berry, Victoria Beach.

65. Hysterographium (n) nova-caesariense (Ell.) Roum. Berens River

66. Lophodermium sphaerioides (A. & S.) Duby. On Ledum, Berens River.
Mytilidion Thujarum (C. & P.) Lohman. On Thuja, E. Man.

67. Acrospermum compressum Tode. On old grass.

69. Elsinoe Ledi (Pk.) Zeller. On Ledum, Vivian.
Chaetomium (n) funicola Cke. In soil (1:258).
C. olivaceum C. & E. In soil.
C. setosum Wint. In butter (2:101).
C. (n) spirale Zopf. In soil. (1:258)
C. spirochaete Palliser. On old paper.
Delitschia furfuracea Niessl. On dung, Long Point (Coll. Wm. Güssow, det. S. Dowding).

70. Fimetaria discospora (Auersw.) G. & S. On dung, Long Point. Wm. Güssow)
F. funicola Cke. In dung culture.
F. leucoplaca (B. & Rav.) G. & S. On dung, Victoria Beach.
Gelasinospora cerealis Dowding (3). Cereal roots (J. E. Machacek)
G. tetrasperma Dowding (3). On dung, near Churchill (Wm. Güssow)
Pleurage erostrata D. Griff. On dung.
Sporormia fasciculata Jensen. In soil (1:258)
Acanthostigma (n) Clintoni Pk. On Populus.
A. (n) dispar Morg. On Populus.
A. microsporon Karst. Form on old wood.

Add to:-

Page

71. Calosphaeria exilis E.&E. On Populus.
Teichospora fulgurata E.&E. Old wood.

73. Didymella lophospora Sacc. & Speg. On Vitis.
Leptosphaeria (n) culmorum Awd. On grass, Berens River.
L. (n) mesoedema (B. & C.) E.&E. On old stems (J. E. Machacek).

74. Metasphaeria Polygoni-sagittati (Schw.) E. & E. On Polygonum.
Ophiobolus (n) anguillides (Cke.) Sacc. On Heracleum.

75. Phomatospora Rosae Rehm. On Rosa.

76. Anthostomella (n) pholidigena (Ell.) E. & E. On Thuja, E. Man.

78. Melanconis marginalis (Pk.) Wehmeyer. On Alnus, E. Man.
M. thelebola (Fr.) Sacc. On Alnus, Berens River.

79. Diatrypella placenta Rehm. On Alnus, Berens River.

80. Sporobolomyces salmonicolor Kluyv. & van Niel.

81. Cintractia subinclusa (Koern.) Magn. On Carex atherodes.
Doassansia Sagittariae (Westend.) Fisch. Poplar Point.

82. Coleosporium Viburni Arth. On V. Lentago.
Gymnosporangium Nelsoni Arth. On Amelanchier, Victoria Beach.

83. Melampsoropsis Cassandrae (Pk. & Clint.) Arth. On Chamaedaphne calyculata, Berens River.

85. Puccinia intermixta Pk. On Iva axillaris, Hamiota.
P. Iridis (DC.) Rab. On Iris, West Hawk Lake, E. Man.

87. Pucciniastrum Potentillae Kom. On Sibbaldiopsis, E. Man.
P. sparsum (Wint.) Ed. Fisch. Churchill ('32 P.D.S. report, p. 100).
Uromyces plumbarius Pk. On Gaura coccinea. Wawanesa (H. Groh).
Platygloea fimicola Schroet. On dung.

88. Sebacina incrustans (Pers.) Fckl. On ground.

89. Corticium laeve Pers. On Pyrus Malus.

Add to:-

Page

89. Corticium pelliculare Karst. On Ulmus.
Cyphella galeata (Schum.) Fr. On moss. Vivian.
C. (n) trachychaeta E. & E. On oak leaves.
Hymenochaete agglutinans Ell. On branches.

90. H. corrugata (Fr.) Lév. On wood.
Hypochnus subferrugineus Burt. On burnt wood.

91. Stereum sanguinolentum Alb. & Schw. On a conifer, E. Man.

93. Hydnum (n) spadiceum Pers. Ingolf.

94. Fistulina hepatica (Huds.) Fr. On oak, Headingly (Dr. W. J. Grant).

95. Polyporus guttulatus Pk. On wood, Bird's Hill.
P. nidulans Fr. On Viburnum.

96. P. vulgaris (Fr.) Cke. On wood.

97. Trametes malicola B. & C. On Populus.
T. suaveolens (L.) Fr. On Salix.
Boletinus paluster Pk. In muskeg, Kenora.

99. Collybia atrata Fr. On burnt places, Clear Lake.

103. Lepiota americana Pk. Not uncommon in 1933.
Marasmius (n) erythropus Fr. Clear Lake.
Mycena atroalba Fr. Amongst moss.
M. crystallina Pk. On mossy bark.
M. cyaneobasis Pk. On wood or debris.

104. Omphalia (n) umbratilis Fr. On burnt places, Clear Lake.
Pleurotus fimbriatus Fr. var. regularis Kauff. Victoria Beach.

106. Tricholoma fuligineum Pk. Clear Lake.

107. Eccilia (n) mordax Atk. Vivian.
Entoloma jubatum Fr. Ingolf.

109. Cortinarius badius Pk. Clear Lake.

110. Galera cyanopes Kauff. Victoria Beach.
G. (n) flava Pk. On the ground.

111. Hebeloma mesophaeum Fr. In sandy woods, Beausejour.

Add to:-

Page

111. Hebeloma simile Kauff. Clear Lake.

112. Naucoria tabacina Fr. In grassy woods, Victoria Beach.
Pholiota (n) mycenoides Fr. In moss, Clear Lake.

113. Tubaria (n) pellucida (Bull.) Fr. In deciduous woods.

114. Psalliota silvatica Fr. Berens River.
Psilocybe (n) spadicea Fr. Ingolf.

115. Coprinus aphthosus Fr. On wood in a cellar.

122. Acrostalagmus albus var. varius Jensen. In soil.
Alternaria tenuis Nees. In soil and butter (1:265; 2:100).
Aspergillus flavipes (Bain. & Sart.) Thom & Church. In soil and butter (1:259; 2:101).
A. flavus Link. In soil and butter (1:259; 2:101).
A. insuetus (Bain.) Thom & Church. In cereal roots (J. E. Machacek).
A. (n) nidulans (Eid.) Wint. In butter (2:101).
A. Okazakii Okazaki. In soil (1:259).
A. repens (Cda.) deBary & Wor. On damp tobacco.
A. Sydowi (Bain. & Sart.) Thom & Church. In flour and soil.
A. ustus (Bain.) Thom & Church. In soil and butter (1:259; 2:101)
A. versicolor (Vuill.) Tirab. In soil (1:259).

123. Botryotrichum atrogriseum van Beyma. In soil (1:265)
B. piluliferum Sacc. & March. In soil (1:265).
Botrytis terrestris Jensen. In soil (1:260).
B. Tulipae (Lib.) Lind. On tulips from Ontario.
Cephalosporium acremonium Cda. In soil and butter (1:260; 2:101).
C. (n) curtipes Sacc. In soil (1:260).
C. humicola Oud. In soil (1:260).
Cercospora Bizzozzeriana Sacc. & Berl. On Lepidium Draba, Brandon.

124. C. illinoensis Barth. On Asclepias syriaca.
C. Ziziae E. & E. On Zizia cordata. Bird's Hill.

125. Cladosporium Paeoniae Pass. On cultivated Paeonia.
C. (n) stercorarium Cda. On rabbit dung.
Coniosporium arundinis (Cda.) Sacc. In soil and butter (1:266; 2:101).

126. Cylindrocarpon candidum (Link) Wollenw. In soil (1:260).
C. candidum var. majus Wollenw. In soil (1:260).

Add to:-

Page

126. Cylindrocarpon didymum (Hart.) Wollenw. In soil (1:260).
C. (n) heteronemum (B. & Br.) Wollenw. In soil (1:260).
C. macrosporum (Fres.) Wollenw. In soil (1:260).
Fusarium arthrosporioides Sherb. In cereal roots (W. L. Gordon).
F. (n) bulbigenum Cke. & Mass. In butter (2:101).
F. culmorum var. cereale (Cke.) Wollenw. In soil (1:261) and roots.
F. dimerum Penz. In butter (2:101).
F. Equiseti (Cda.) Sacc. In soil (1:261) and roots.
F. Equiseti var. bullatum (Sherb.) Wollenw. In cereal roots.
F. herbarum (Cda.) Fr. From cereal roots (W. L. Gordon).
F. herbarum var. avanaceum (Fr.) Wollenw. In soil (1:261).
F. ossicolum (B. & C.) Sacc. (F. Equiseti form 1). In soil.
F. oxysporum var. aurantiacum (Cda.) Wollenw. In soil.
F. Poae (Pk.) Wollenw. In soil, butter (1:261; 2:101) and roots.
F. reticulatum Mont. In soil (1:261)
F. sambucinum Fckl. In soil (1:261)
F. Scirpi Lamb. & Faut. In soil (1:261)
F. Scirpi var. acuminatum (E. & E.) Wollenw. In soil (1:261).
F. Scirpi var. filiferum (Preuss) Wollenw. From cereal roots.
F. Solani var. Martii (App. & Wollenw.) Wollenw. In soil (1:261)
F. sporotrichioides Sherb. In soil (1:261).
F. trichothecioides Wollenw. In decayed potato tubers. (W.L. Gordon)
F. vasinfectum Atk. In soil (1:261).
F. vasinfectum var. lutulatum (Sherb.) Wollenw. In soil (1:261).
F. vasinfectum var. zonatum (Sherb.) Wollenw. In soil (1:261).

127. Geotrichum candidum Link. In soil and butter (1:261; 2:101).
Gliocladium atrum Gilm. & Abb. In soil (1:262).
G. catenulum Gilm. & Abb. In soil (1:262).
G. penicilloides Cda. In soil (1:262).
G. roseum (Link) Bain. In soil (1:262) and cereal roots.
Haplographium (n) bicolor Grove. On old wood.
Helicoma monilipes Ell. & Johnson. On old wood (I. Mounce).
Helminthosporium geniculatum Tracy & Earle. In soil and roots (J. E. Machacek).

Add to:-

Page

127. Helminthosporium tetramera McKinney. In cereal roots (J. E. Machacek).
H. torulosum (Syd.) Ashby. In cereal roots (J. E. Machacek).

128. Hormodendron (n) viride (Fres.) Sacc. In soil.
Hyalopus (n) ochraceus Cda. On bark of Populus.
Hymenula affinis (Faut. & Lam.) Wollenw. In soil and butter (1:262; 2:102).
Lemonniera aquatica de Wild. In water.
Monilia (n) geophila Oud. In soil (1:262).
M. implicata Gilm. & Abb. In soil.
Monotospora Daleae Mason. In soil (1:266 as Mycogone).
Myrioconium comitatum J.J. Davis, stage of Sclerotium bifrons.
Oedocephalum (n) beticola Oud. On paper.
Ovularia avicularis Pk. On Polygonum erectum.
Pachybasium pyramidale (Bonord.) Oud. On grass.
Paecilomyces aureo-cinnamomeum (Biourge) Thom. In butter (2:102)
P. varioti Bain. In butter (2:102).
Pedilospora parasitans v. Hoehn. On old wood.
Penicillium albidum Sopp. In soil (1:262).
P. atramentosum Thom. In butter (2:102).
P. aurantio-brunneum Dierckx. In soil and butter (1:262; 2:102).
P. braziliense Thom. In soil (1:262).
P. brevi-compactum Dierckx. In butter (2:102).
P. canescens Sopp. In soil (1:262).
P. carmino-violaceum Dierckx. In soil (1:263).
P. chrysogenum Thom. In soil and butter (1:263; 2:102).
P. (n) citreo-sulfuratum Biourge. In flour.
P. (n) cyclopium Westl. In butter (2:102).
P. Dierckxii Biourge. In soil.
P. (n) Duclauxi Delac. In soil (1:263).

129. P. frequentans Westl. In soil (1:263).
P. funiculosum Thom. In soil (1:263).
P. Gladioli McCull. & Thom. On Gladiolus corms.
P. griseo-roseum Dierckx. In soil (1:263).
P. (n) griseum Sopp. In butter (2:102).
P. guttulosum Abbott. In soil.
P. (n) Herquei B. & S. In soil.
P. implicatum Biourge. In butter (2:102).
P. intricatum Thom. In soil (1:263).
P. janthinellum Biourge. In soil (1:263).
P. Johannioli Zal. In butter (2:102).
P. Kapuscinskii Zal. In soil (1:263).
P. lanosum Westl. In butter (2:102).

Add to:-

Page

129. P. lilacinum Thom. In soil (1:263).
P. luteum Zukal. In soil (1:263).
P. Martensii Biourge. In butter (2:102).
P. nigricans Bain.in Thom. In soil.
P. oxalicum Currie & Thom. In butter (2:102).
P. purpurogenum Stoll. In soil and butter (1:263; 2:103)
P. purpurrescens Sopp. In soil and butter (1:263; 2:103).
P. restrictum Gilm. & Abb. In soil and butter (1:263; 2:103).
P. roqueforti Thom. In butter (2:103).
P. rugulosum Thom. In soil and butter (1:264; 2:103).
P. rugulosum var. atricolum (Bain.) Thom. In soil (1:264).
P. sanguineum Sopp. In butter (2:103).
P. simplicissimum (Oud.) Thom. In soil (1:264).
P. spinulosum Thom. In soil and butter (1:264; 2:103).
P. tardum Thom. In soil.
P. terrestre Jensen. In soil and butter (1:264; 2:103).
P. Thomii Maire. In soil (1:264).
P. Thomi Zal. In soil.
P. variabile Sopp. In soil (1:264).
P. (n) verrucosum Dierckx. In flour.
P. viridicatum Westl. In soil and butter (1:264; 2:103).
Ramularia Impatientis Pk. On Impatiens, Berens River.

130. R. variegata Ell. & Holw. On Petasites. Victoria Beach.
Rhinotrichum (n) griseum Sacc. On old wood.
Sclerotium compactum Tode. On leaves.
S. deciduum J.J. Davis. On stems.

131. Scopulariopsis brevicaulis (Sacc.) Bain. In soil (1:264), and very common on spoiled sweet clover.
S. rufulus Bain. In soil (1:265).
Sporotrichum roseum Link. In soil and butter (1:265; 2:103).
Tetracladium marchalianum de Wild. In water.
Torula convoluta Harz. In soil (1:266).
Trichocladium asperum Harz. In soil (1:266).
Trichoderma album Preuss. In soil (1:265).
T. glaucum Abbott. In soil (1:265).
Trinacrium (n) mycogonis Tassi. On wood.
T. (n) subtile Riess. On stems.
Tuberculina persicina (Ditm.) Sacc. On rusts.
Verticillium (n) glaucum Bonord. In soil (1:265).
V. (n) terrestre (Link) Sacc. In soil (1:265).

133. Cylindrosporium Smilacis E. & E. On Vagnera.

134. Libertella acerina West. On Acer Negundo.
L. betulina Desm. On Betula, Victoria Beach.

Add to:-

Page

135. Ascochyta teretiuscula Sacc. & Roum. On Carex, Vivian.
Botryophoma populicola Karst. On Populus.

136. Camarosporium umbonatum Brenckle. On Symphoricarpos.
Chaetomella (n) atra Fckl. On old wood.

137. Hendersonia arundinacea (Desm.) Sacc. On Phragmites, Berens River.
Mastomyces Friesii Mont. On Ribes.
Phoma hibernica Grimes, O'C., & Cum. In butter (2:103).

138. Phoma nebulosa (Pers.) Berk. On old stems.
P. (n) Paeoniae Allesch. On Paeonia.

140. Septoria Apii var. graveolentis Dorog. On celery.

141. S. Brunellae E. & H. On Prunella, Vivian.

142. S. Menyanthis (Lib.) Desm. On Menyanthes, Gimli.

144. Sphaeronema (n) spinella Kalch. In soil.

145. Stagonospora Petasitidis E. & E. On Petasites, Victoria Beach.

Appendix

The following fungi have been found upon plants or plant parts imported into Winnipeg.

Alternaria Citri Pierce. On orange (J. E. Machacek).
Gloeosporium Musarum Cke. Common on ripe banana "peel".
Phomopsis Citri Fawcett. On grape-fruit (J. E. Machacek).
Puccinia Ornithogali-thyroidis Diet. On Ornithogalum ?lacteum grown from bulbs from South Africa.

VII. DISEASES OF MISCELLANEOUS PLANTS

The present section contains records of over 400 specimens, which were added to the Mycological Herbarium, Division of Botany, Ottawa, in the last year. Most of these specimens have been collected in the past three years, but were only determined during the last 12 months. Where a specimen is deposited in the herbarium, it is marked by an asterisk (*). The chief contributors and the areas, in which they collected, were: G. E. Woolliams, Okanagan valley, B.C.; H.T. Gussow and C. Perrault, Cacouna, Que.; J. Adams, Anticosti island, Que.; A. W. McCallum, in the Gaspé, Que.; and J. W. Groves, wood-inhabiting Inoperculatae, Ottawa, Ont., and Kingsmere, Que. Many individual specimens were also sent by collaborators. Records for this section were chiefly sent from Manitoba and Saskatchewan, with specimens accompanying, all of which have not been examined.

Abies balsamea (L.) Mill

*Asterina nuda Pk. Kentville, N.S.
*Colyptospora Goeppertiana Kühn, Cacouna, Que.
*Dasyscypha Agassizii (B.& C.) Sacc. L'Islet Co., Que.
*Dermatea balsamea (Pk.) Seaver, Mt. Burnet, Que.
*Herpotrichia nigra Hartig, Mt. Lyall, Gaspé, Que.
*Melampsorella Caryophyllacearum Schroet. Anticosti island, Que. (J. Adams)
*Scoleconectria balsamea (Cke. & Pk.) Seav. Mt. Burnet, Que. (H.T. Gussow)

Abies grandis Lindl.

*Creonectria Cucurbitula (Sacc.) Seav. on bark, Cowichan lake. B.C.

Acer glabrum Torr.

*Phyllosticta minutissima Ell. & Ev. South Canoe, B.C.

Acer Negundo L.

*Coryneum septosporiodes Sacc. & Syd. Edmonton, Alta.
*Hypoxylon rubiginosum (Pers.) Fr. Keewatin, Ont.
*Nectria Peziza (Tode) Fr. Keewatin, Ont.
*Piggotia Negundinis E.& D. Martinville, Que.
*Septoria Negundinis Ell. & Ev. Martinville, Que.
*Sphaeropsis albescens Ell. & Ev. Edmonton, Alta.
*Tubercularia vulgaris (Tode) Fr. Edmonton, Alta.

Acer pennsylvanicum L.

*Rhytisma punctatum (Pers.) Fr. Kingsmere, Que.
*Septoria acerina Pk. Algonquin Park, Ont.

Acer rubrum L.

*Phyllosticta acericola Cke. & Ell. Berthierville, Que.

*Rhytisma acerinum (Pers.) Fr. Berthierville, Que.
*Sphaeronema acerinum Pk. Kingsmere, Que.

Acer saccharinum L.
*Rhytisma acerinum (Pers.) Fr. Ste. Anne, Que.

Acer saccharum Marsh.
*Steganosporium acerinum Cda. Stanstead, Que.; Ottawa, Ont.
*Verticillium Dahliae Kleb. Stanstead, Que.

Acer sp.
*Creonectia purpurea (L.) Seav. Mt. Burnet, Que.
*Massaria vomitoria B. & C. on dead sapling, Abbotsford, Que.
*Ustulina vulgaris Tul. on stump.

Actaea rubra (Ait.) Willd.
*Puccinia Clematidis (DC.) Lagerh. Kingsmere, Que.

Agrimonia gryposepala Wallr.
*Pucciniastrum Agrimoniae (Schw.) Tranz. Chelsea, Que.

Agropyron caninum (L.) R. & S.
Claviceps purpurea (Fr.) Tul. Steinbach, Man., trace.

Agropyron cristatum J. Gaertn. (cult.)
Claviceps purpurea (Fr.) Tul. Winnipeg, Man., trace.

Agropyron dasystachyum (Hook.) Schrib.
*Ustilago bromivora (Tul.) Fisch. v. Waldh. Edmonton, Alta. July, artificially inoculated.

Agropyron Griffithsii Scribn. & Smith
*Ustilago bromivora (Tul.) Fisch. v. Waldh. Edmonton, Alta. July, artificially inoculated.

Agropyron repens (L) Beauv.
Erysiphe graminis DC. Common in York and Sunbury counties, N.B.
*Phyllachora graminis (Pers.) Fuck. St. Francois, Que.
Puccinia graminis Pers. Winnipeg, Man., trace.

Agropyron Richardsoni Schrad.
*Bacterium Agropyri (O'Gara) Stev. Innisfail, Alta. (A.W. Henry)
Claviceps purpurea (Fr.) Tul. Swan River, Man., slight infection.
*Ustilago bromivora (Tul.) Fisch. v. Waldh. artificially inoculated. Edmonton, Alta. July.

Agropyron Smithii Rydb.
Claviceps purpurea (Fr.) Tul. Bird's Hill, Man., fifty

per cent of the plants infected.
Puccinia Clematidis (DC.) Lagerh. Bird's Hill, Man., moderate infection.

Agropyron tenerum Vasey
Claviceps purpurea (Fr.) Tul. Winnipeg, Man., 95% of the plants infected.
Erysiphe graminis DC. Lac du Bonnet, Man., 1933, trace
*Ustilago bromivora (Tul.) Fisch. v. Waldh. Edmonton, Alta., July, artificially inoculated; Nappan, N.S., July 21. First record for Nova Scotia.

Agropyron trachycaulon (Lk.) Malte var. ciliatum (Scribn.& Sm.)Malte
*Puccinia Clematidis (DC.) Lagerh. Peachland, B.C.

Agropyron sp.
Septoria Agropyri Ell. & Ev. Pense, Sask.

Alnus incana Willd.
*Tympanis alnea (Pers.) Fr. Constance Bay, Ont.

Alnus rubra Bong.
*Phyllactinia corylea (Pers.) Karst. Summerland, B.C.

Alnus sp.
*Creonectria purpurea (L.) Seav. La Salle woods, Montreal Que.
*Phyllactinia corylea (Pers.) Karst. Deschambault, Que.
*Scorias spongiosa (Schw.) Fr. Farmers Rapids, Que. Fredericton, N.B.

Althaea rosea L. (cult.)
*Ascochyta althaeina Sacc. & Bizz. Abbotsford, Que.
*Puccinia Malvacearum Bert. Lennoxville, Que.
*Septoria malvicola Ell. & Mart. St. Pacome, Que.

Ambrosia psilostachya DC.
Puccinia Xanthii Schw. Pipestone, Man., slight. This is apparently a new host for Canada.

Amelanchier alnifolia Nutt.
Apiosporina Collinsii (Schw.) v. Höhn. Lac du Bonnet, Man., severe.

Amelanchier florida Lindl.
*Gymnosporangium juvenescens Kern, Hedley, B.C.

Amelanchier sp.
*Gymnosporangium clavipes Cke. & Pk. Grand Lake, Queens Co., N.B.
*G. juvenescens Kern, Estevan, Sask.

Amphicarpa monoica (L.) Ell.
*Synchytrium aecidioides (Pk.) Lagerh. Ottawa, Ont.; Oka, Que.

Andromeda polifolia L.
*Rhytisma Andromedae (Pers.) Fr. Anticosti island, Que. (J. Adams).

Anemone canadensis L.
*Plasmopara pygmaea (Ung.) Schröt. Muenster, Sask.
Puccinia Clematidis (DC.) Lagerh. Lac du Bonnet, Man., trace; Bede and Cowan, heavy infection.

Anemone cylindrica A. Gray
Phleospora Anemones Ell. & Kellerm. Ethelbert, Man. Heavy infection.

Anemone virginiana L.
Puccinia Clematidis (DC.) Lagerh. Dutton, Man. Severe infection.

Anemone sp.
*Puccinia Anemones-virginianae Schw. Kingsmere, Que.

Antirrhinum majus L. (cult.)
*Puccinia Antirrhini Diet. & Holw. Windsor, Ont.

Arabis retrofracta Greene
*Puccinia monoica Arth. Sutherland, Sask.

Arabis sp.
Cystopus candidus (Pers.) de Bary, Lac du Bonnet, Man. June 16, trace.

Aralia nudicaulis L.
*Nyssopsora clavellosa (Berk.) Arth. near Federal Hill, Gaspé, Que.

Arctium Lappa L.
Septoria Lapparum Sacc. Lac du Bonnet, Man., June 16, trace.

Arctium minus Bernh.
*Puccinia Bardanae Cda. North Gower, Ont.

Arisaema triphyllum (L.) Schott.
*Uromyces Caladii (Schw.) Farl. Beauceville and Abbotsford, Que.

Aristolochia macrophylla Lamb. (cult.)
*Phyllosticta Aristolochiae Tassi, Beebe, Que.

Artemisia biennis Willd.
Cystopus cubicus (Strauss) Lév. Brunkild, Man., moderate infection.

Artemisia frigida Willd.
Puccinia Millefolii Fuck. Virden and Ethelbert, Man., slight infection. First record apparently on this host for Canada.

Artemisia gnaphalodes Nutt.
Puccinia universalis Arth. Oak Lake, Man., moderate infection.

Aster cordifolius L.
*Coleosporium Solidaginis (Schw.) Thüm Ottawa West, Ont.

Aster laevis L.
Puccinia extensicola Plowr. Morden and Lac du Bonnet, Man., slight infection.

Aster Lindleyanus T. & G.
*Coleosporium Solidaginis (Schw.) Thüm. Westboro, Ont.
*Puccinia extensicola Plowr. Federal Hill, Gaspé, Que.

Aster multiflorus Ait.
Puccinia extensicola Plowr. Virden, Man., infection slight.

Aster paniculatus Lam.
*Coleosporium Solidaginis (Schw.) Thüm. Ottawa, Ont.
Septoria atropurpurea Pk. Strathclair, Man., trace.

Aster Tradescanti L.
*Coleosporium Solidaginis (Schw.) Thüm. Ottawa, Ont.

Aster sp.
*Coleosporium Solidaginis (Schw.) Thüm. Kingsmere and Cacouna, Que.
Erysiphe Cichoracearum DC. York county, N.B.

Avena sativa L. (cult.)
*Puccinia coronata Cda. Shediac, N.B.

Berberis vulgaris L. (cult.)
*Phytomonas Berberidis Thornb. & And. Ottawa, Ont.
*Puccinia graminis Pers. Merrickville, North Gower and Appleton, Ont.

Betula alba L. var. papyrifera (Marsh.) Spach
*Chlorosplenium aeruginascens (Wyl.) Karst. Clova, Que
Septoria microsperma Pk. Lotbiniere, Que.
*Taphrina flava Farl. Tremont, N.S.

Betula occidentalis Hook.
*Daldinia occidentale Child, Cheetzi, B.C. (A.T. Davidson) Nov. 1926.

Betula sp.
*Daldinia concentrica de Not. Ottawa district, Ont., Dec. 28, 1926. (W.S. Odell)
*Daldinia occidentale Child, Snow Mountain, B.C. (H.R. McLarty) Oct. 13; Summerland, B.C. (I. Mounce) Sept. 8, 1932; Saskatoon, Sask. (I. Mounce) July 25, 1932.
The author reports this species from Ontario and British Columbia. The Saskatchewan record is new, but is in line with the distribution that she reported for the species.

Brassica pekinensis Rupr. (cult.)
*Cercosporella albo-maculans (Ell. & Ev.) Sacc. Strathroy, Ont.

Bromus ciliatus L.
*Puccinia Clematidis (DC.) Lagerh. Vermilion, Alta.

Bromus Hookerianus Thurb.
*Puccinia Clematidis (DC.) Lagerh. South Canoe, B.C.

Bromus inermis Leyss.
Claviceps purpurea (Fr.) Tul. Winnipeg, Man., ten per cent of the plants infected; Gimli, trace.
Scolecotrichum graminis Fuck. Light infection in 2 fields in Alberta.
Septoria bromigena Sacc. Morris and Homewood, Man., severe, of general occurrence in southern Manitoba.
Eelworms caused reddish galls along the midrib of the leaves, Inglis, Man.

Bromus tectorum L.
*Ustilago bromivora (Tul.) Fisch. v. Waldh. Oliver, B.C.

Calamagrostis americana Scribn.
Claviceps purpurea (Fr.) Tul. Minitonas, Man., 75% of the plants infected.

Calamagrostis canadensis (Michx.) Beauv.
Claviceps purpurea (Fr.) Tul. *Terrace, B.C.; 75% of the plants infected in 15 localities in northern Manitoba.
Puccinia coronata Cda. Cowan and Boissevain, Man. Moderate infection.

Capsella Bursa-pastoris (L.) Medic.
*Cystopus candidus (Pers.) de Bary, Ottawa and North Gower,

Ont.; Anticosti island, Que. (J. Adams)
*Peronospora parasitica (Pers.) de Bary, Anticosti island, Que. (J. Adams)

Caragana sp. (cult.)
*Septoria Caraganae (Jacz.) Died. Indian Head, Sask.

Carex Goodenowii J. Gray
*Cintractia Caricis (Pers.) Magn. Cacouna, Que.

Caulophyllum thalictroides Michx.
*Cercospora Caulophylli Pk. Kingsmere, Que.

Celastrus scandens L.
*Phyllactinia corylea (Pers.) Karst. Kingsmere, Que.

Chamaedaphne calyculata (L.) Moench
*Dermatea pezezoides Pk. Ottawa, Ont.

Chamaenerion spicatum (Lam.) S.F. Gray
Puccinia ludibunda Ell. & Ev. Bowsman, Man., trace.
*Pucciniastrum Abieti-Chamaenerii Kleb. South Canoe, B.C.

Chenopodium album L.
*Peronospora effusa (Grev.) Rabh. Garson, Man., moderate infection.
Puccinia subnitens Diet. Morden, Man., heavy infection First record on this host in Manitoba. (W.L. Gordon)
Stagonospora Atriplicis (West.) Lind. Starbuck, Man. moderate infection.

Chiogenes hispidula (L.) T.& G.
*Chrysomyxa Chiogenis Diet. Mt. Lyall, Gaspé, Que.

Chrysanthemum Leucanthemum L.
Yellows (virus)was common on this plant in fields in York and Sunbury counties.

Cicuta maculata L.
Puccinia Cicutae Lasch, Greenwich, N.S. Infection general on a few plants.

Circaea alpina L.
*Puccinia Circaeae Pers. Crooked River, Sask.; Federal Hill, Gaspé, Que.

Circaea lutetiana L.
*Puccinia Circaeae Pers. Kingsmere, Que.

Cirsium arvense L.
*Puccinia suaveolens (Pers.) Rostr. Ottawa, Ont.; Anticosti

island, Que. (J. Adams)

Cirsium lanceolatum (L.) Hill
*Puccinia Cnici H. Mart. North Gower, Ont.

Cirsium undulatum (Nutt.) Spreng.
Puccinia Cirsii Lasch, Griswold, Man., few plants infected.

Clematis ligusticifolia Nutt.
*Puccinia Clematidis (DC.) Lagerh. Summerland, B.C.
*Septoria Clematidis Rob. Indian Head, Sask.

Clintonia borealis (Ait.) Raf.
*Puccinia mesomajalis B.& C. Federal Hill, Gaspé, Que.

Comandra pallida DC.
*Cronartium Comandrae Pk. Chalk River, Ont.

Convolvulus sepium L.
Septoria Convolvuli Desm. Homewood, Man., slight

Cornus alternifolia L.
*Microsphaera Alni (Wallr.) Salm. Abbotsford, Que.

Cornus canadensis L.
*Glomerularia Corni Pk. Cacouna, Que.
*Puccinia porphyrogenita Curtis, Federal Hill, Gaspé, Que.

Cornus circinata L'Her
*Pezicula Corni Petrak, Ottawa, Ont.

Corylus americana Walt.
Gnomoniella Coryli (Batsch) Sacc. Marysville, N.B.
Septoria corylina Walt. Lac du Bonnet, Man., June 16., slight.
*Tubercularia vulgaris (Tode) Fr. Edmonton, Alta.

Corylus rostrata Ait.
*Diplodina macrospora Ell. & Ev. Constance Bay, Ont.

Corylus sp.
*Cenangium furfuraceum (Roth) de Not. M.A.C., Winnipeg, Man.
*Discosia artocreas (Tode) Fr. Lennoxville, Que.

Crataegus Oxycantha candida (cult.)
*Gymnosporangium globosum Farl. Arboretum, Ottawa, Ont.

Crataegus sanguinea (cult.)
*Gymnosporangium globosum Farl. Arboretum, Ottawa, Ont.

Crataegus sp.
*Gymnosporangium clavipes Cke. & Pk. Hull, Que.
*G. globosum Farl. Ottawa, Ont.

Cucumis sativus L. (cult.)
*Cladosporium cucumerinum Ell. & Arth. Brampton, Ont.

Dactylis glomerata L.
*Puccinia graminis Pers. Vernon, B.C.

Delphinium cultorum Voss (cult.)
*Erysiphe Polygoni DC. Summerland, B.C.

Dianthus sp. (cult.)
*Uromyces caryophillinus (Schrank) Wint., greenhouse, Toronto, Ont.
*Ustilago violacea (Pers.) Fuck., on both red and white flowering varieties. Greenhouse, Toronto, Ont.

Dicentra canadensis DC.
*Peronospora Dicentrae Syd.; near Kingston, Ont.

Dirca palustris L.
*Aecidium hydnoideum B. & C. Chalk River, Ont.

Distichlis spicata (L.) Greene
*Uromyces Peckianus Farl. Sidney, B.C.

Elymus canadensis L.
Claviceps purpurea (Fr.) Tul. Winnipeg, Man., trace.

Elymus condensatus Presl.
*Claviceps purpurea (Fr.) Tul. West Summerland, B.C.
*Puccinia Clematidis (DC.) Lagerh. West Summerland and Vernon, B.C.

Elymus curvatus Piper
Claviceps purpurea (Fr.) Tul. Winnipeg, Man., trace.

Elymus sp.
Epichloe typhina (Pers.) Tul. Several tufts of grass at M.A.C., Winnipeg, Man., bore this fungus, which is not common in Manitoba (G.R. Bisby); the imperfect stage, Sphacelia typhina (Pers.) Sacc., was collected on an unknown grass at Abbotsford, Que. (3502)

Empetrum nigrum L.
*Chrysomyxa Empetri Schroet. Mt. Lyall and Mt. Sterling, Gaspé, Que.
*Rhytisma Empetri Fr. Table Top Mt., Gaspé, Que.

Epilobium sp.
*Pucciniastrum pustulatum (Pers.) Diet. Federal Hill, Gaspé, Que.

Erigeron canadensis L.
Yellows (virus) was common on this plant in Westmoreland Sunbury, York and Queens counties, N.B.

Erythronium americanum Ker.
*Ustilago Heufleri Fuck. Kingston, Ont.

Eupatorium urticifolium Reichard
*Puccinia Eleocharidis Arth. Kingsmere, Que.

Euphorbia glyptosperma Engelm.
*Uromyces proeminens (DC.) Pass. Bell's Corners, Ont.

Eutrema Edwardsii R. Br.
*Pleospora herbarum (Pers.) Rabh. Maguse River, N.W.T. 9-7-32. (coll. Wm. Gussow, det. J. Dearness)

Fagus grandifolia Ehrh.
*Hypoxylon cohaerens Pers. Chelsea, Que.

Fragaria canadensis Michx.
Ramularia Tulasnei Sacc. General in most localities in Man.

Fraxinus sp.
*Phyllosticta viridis E. & K. Lumsden, Sask.
*Piggotia Fraxini B. & C. Lumsden, Sask.
*Sphaerographium Fraxini (Pk.) Sacc. Kingsmere, Que.

Gaultheria Shallon Pursh.
*Dasyscypha Gaultheriae (E.& E.). Trail, B.C.
Phyllosticta Gaultheriae E. & E. General on Vancouver island, B.C. September, 1933.

Glycyrrhiza lepidota (Nutt.) Pursh.
Uromyces Glycyrrhizae (Rabh.) P. Magn. Lac du Bonnet, Man., heavy; Winnipeg, moderate.

Grindelia squarrosa (Pursh.) Dunal
*Puccinia Grindeliae Pk. Prud'homme, Sask.

Helianthus annuus L.
*Sclerotinia Sclerotiorum (Lib.) de Bary. Colonsay, Sask.

Helianthus giganteus L.
Puccinia Helianthi Schw. Griswold and Brunkild, Man., slight

Helianthus Maximiliani Schrad.
Puccinia Helianthi Schw. Swan River, Man., slight; La Salle, severe.

Heracleum lanatum Michx.
Cylindrosporium Heraclei Ell. & Ev. Bowsman, Man., slight.

Hieracium canadense Michx.
*Puccinia Hieracii (Schum.) H. Mart. Anticosti island, Que. (J. Adams)

Hieracium sp.
Yellows (virus) was found on this plant in abundance at the Experimental Station, Fredericton, N.B.

Hordeum distichon L. cult.)
*Puccinia anomala Rostr. Burritts Rapids, Ont.

Hordeum jubatum L.
Erysiphe graminis L. Lac du Bonnet, Man. Severe on some plants.
Septoria Passerinii Sacc. Gretna, Man., moderate; Morris, heavy.
Ustilago Lorentziana Thüm. Trace in zone 10 of Alberta.

Hordeum vulgare L.
*Puccinia anomala Rostr. Burritts Rapids, Ont.

Hordeum sp. (cult.)
*Helminthosporium teres Sacc. Manotick, Ont.

Houstonia caerulea L.
*Uromyces houstoniatus (Schw.) Sheldon, Lennoxville, Que.

Hydrocotyle sp.
*Erysiphe Polygoni DC. Chelsea, Que.

Hypericum sp.
*Uromyces Hyperici-frondosi Arth. Kingsmere, Que.

Iris versicolor L.
Heterosporium gracile (Wallr.) Sacc. Morden, Man., June 5, slight.
*Puccinia Iridis (DC.) Rabh. Fredericton, N.B.

Iris sp. (cult.)
Heterosporium gracile (Wallr.) Sacc. Beebe, Que.

Iva xanthifolia Nutt.
Basidiophora Kellermanii (E. & H.) Wils. Morden, Man., trace.

Juglans cinerea L.
*Marssonina Juglandis (Lib.) Magn. Abbotsford and St. Sulpice, Que.

Juniperus communis L. var. depressa Pursh
*Gymnosporangium clavariaeforme (Jacq.) DC. Carp, Ont.
*G. clavipes Cke. & Pk. Carp, near Kingston, Constance Bay, Ont.; Hull, Que.

Juniperus horizontalis Moench.
*Gymnosporangium clavipes Cke. & Pk. Ste. Anne de la Pocatière, Que., May 31 (E. Campagna). This appears to be the first record of this rust on the above species in Canada or the United States. (I. L. Conners).
*G. corniculans Kern. Bird's Hill, Man.

Juniperus fragrans (cult.)
*Gymnosporangium globosum Farl. Arboretum, Ottawa, Ont.

Juniperus virginiana L.
*Gymnosporangium globosum Farl. Kingston, Almonte, Ottawa Ont.

Kalmia latifolia L.
*Mycosphaerella colorata (Pk.) Earle, immature, Ste. Anne de la Pocatière, Que.

Lactuca pulchella (Pursh) DC.
Puccinia minussensis Thum. General occurrence throughout Manitoba.

Lactuca sativa L. (cult.)
*Marssonina Panattoniana (Berl.) Magn. Saanichton, B.C.; Port Dalhousie, Ont.

Lactuca spicata (Lamb.) Hitch.
*Sphaerotheca Humuli (DC.) Burr. var. fuliginea (Schl.) Salm. South Canoe, B.C.

Lappula echinata Gilib.
Puccinia subnitens Diet. Deloraine, Man. June 6; slight. This is apparently the first report on this host.

Lathyrus ochroleucus Hook.
Uromyces Fabae (Pers.) de Bary, Benito, Man., slight.

Lathyrus venosus Muhl.
Mosaic (?virus) was severe, Seddon's Corners, Man.

Ledum gladulosum Nutt.
* Chrysomyxa Ledi de Bary. Hedley, B.C.

Ledum groenlandicum Oeder
* Chrysomyxa Ledi de Bary. Mt. Lyall, Gaspé, Que.

Leontodon autumnalis L.
Yellows (virus) was common on fall dandelion in York, Sunbury and Westmoreland counties, N.B.

Lepidium densiflorum Schrad.
Cystopus candidus (Pers.) Lév. Lac du Bonnet, Man., severe on some plants.

Lewisia rediviva Pursh
Uromyces Spragueae Hark. Kaleden, B.C. (G.E. Woolliams) The material was compared with the descriptions of this species and that of U. unitus Pk. as given in the N. Am. Flora 7:444 et seq. and with F. Col. 1373 referred by Arthur to U. unitus. Without doubt, the above collection is referable to the above species rather than U. unitus. (I.L. Conners)

Lonicera orientalis
* Glomerularia Corni Pk. Arboretum, Ottawa, Ont.

Lonicera sp.
* Phyllosticta Caprifolii (Opiz.) Sacc. Beebe, Que.

Lupinus perennis L.
* Erysiphe Polygoni DC. Summerland, B.C.

Lycopersicum esculentum Mill. (cult.)
* Alternaria Solani (E. & M.) J. & G. Farnham, Que.
* Septoria Lycopersici (Speg.) Sacc. Manotick, Ont.

Lygodesmia juncea Don.
* Puccinia Stipae Arth. Pike Lake, Sask.

Malva rotundifolia L.
Septoria malvicola Ell. & Mart. North Gower, Ont.; Fredericton, N.B., a few plants affected Sept. 2.

Medicago sativa L.
* Plenodomus Meliloti Dearn. & Sanf. Picardville, Alta.
* Pseudopeziza Medicaginis (Lib.) Sacc. Summerland and Vernon, B.C.; Aylmer, Que.
* Uromyces Medicaginis Pass. North Gower, Ont.

Melilotus alba Desv.
* Stagnospora Meliloti (Lasch) Petrak, South Canoe, B.C.

Melilotus officinalis (L.) Lam.
* Stagonospora Meliloti (Lasch) Petrak, Indian Head, Sask.

Mentha canadensis L.
* Puccinia Menthae Pers. M.A.C., Winnipeg, Man.; West Summerland, B.C.

Mentha glabrior (Hook.) Rydb.
* Puccinia Menthae Pers. Prud'homme, Sask.
Septoria menthicola Sacc. & Let. Prud'homme, Sask.

Mitella nuda L.
* Puccinia Heucherae (Schw.) Diet. Pike Lake, Sask.; Federal Hill, Gaspé, Que.

Monarda mollis L.
* Puccinia Menthae Pers. Armstrong, B.C.

Myrica Gale L.
* Tubercularia vulgaris (Tode) Fr. Cacouna, Que.

Neslia paniculata (L.) Desv.
Cercosporella Nesliae Dearn. & Bisby. Alberta, 1933; general infection.

Oenothera biennis L.
Puccinia ludibunda Ell. & Ev. Lac du Bonnet, Man., June 16, trace.

Osmorrhiza Claytoni (Michx.) Clarke
Puccinia Pimpinellae (Strass) H. Mart. Kingsmere, Que.

Oxytropis bellis (Britt.) Palibine
* Mycosphaerella Astragali (Currey), Long Point, Man., 29-6-32 (Coll. Wm. Gussow, det. J. Dearness)

Paeonia sp.
* Cladosporium Paeoniae Pass. L'Assomption, Que.

Petasites frigidus (L.) Fr.
* Puccinia conglomerata (Strauss) Schmidt & Kunze, Peachland, B.C.

Phalaris arundinacea L.
Claviceps purpurea (Fr.) Tul. Swan River, Man., Aug. 11, moderate.

Phalaris sp.
Claviceps purpurea (Fr.) Tul. Experimental plots, Lacombe. Alta., light infection.

Phaseolus vulgaris L. (cult.)
* Colletotrichum Lindemuthianum (Sacc. & Mag.) Bri. & Cav. Jacques Cartier Co., Que.

Phegopteris Dryopteris (L.) Fée
* Uredinopsis Phegopteridis Arth. Lake Timagami, Ont.

Phleum pratense L.
* Puccinia graminis Pers. Vernon, B.C.; North Gower, Ont.; Pt. Fortune, Que.
* Ustilago striaeformis (Westd.) Niessl. M.A.C., Winnipeg, Man. First record for Manitoba.

Phlox paniculata L.
* Septoria divaricata Ell. & Ev. Beebe, Que.

Phlox sp.
* Erysiphe Cichoracearum DC. Aylmer, Que.

Physalis grandiflora Hook
* Puccinia Physalidis Pk. Abbotsford, Que.

Picea mariana (Mill.) B.S.P.
* Herpotrichia nigra Hartig, Mt. Lyall, Gaspé, Que.

Picea sp.
* Dasyscypha Agassizi (B.& C.) Sacc. Cacouna, Que.

Pinus Banksiana Lamb.
* Coleosporium Solidaginis (Schw.) Thum. Chalk River, Ont.
* Cronartium Comandrae Pk. Chalk River, Ont.
* C. Comptoniae Arth. Biscotasing and Constance Bay, Ont. This rust produces extensive cankers in the butt of the tree, which gives the base a peculiar swollen appearance. (I.L. Conners & C.G. Riley)
* C. Quercuum Miyabe, Constance Bay, Ont.
* Zythia resinae (Ehrenb.) Karst, Constance Bay, Ont.

Pinus resinosa Ait.
* Coleosporium Solidaginis (Schw.) Thum. Chalk River, Ont.

Pisum sativum L. (cult.)
* Erysiphe Polygoni DC. Hudson Heights, Que.
* Uromyces Fabae (Pers.) de Bary, Macdonald College, Que.

Plantago eriopoda Torr.
Puccinia subnitens Diet. Morden, Man., 1933; severe. This is evidently the first report on this host for Manitoba.

Plantago major L.
Erysiphe Cichoraceorum DC. Lavington, B.C.; Cowan, Man., 1933, slight; *Neuville, Que.
Yellows (virus) was common on plantain in Westmoreland, York, Sunbury and Queens counties, N.B.

Poa compressa L.
Claviceps purpurea (Fr.) Tul. Clear Lake, Man., slight.

Polygonum aviculare L.
Cercospora avicularis Wint. M.A.C., Winnipeg, Man.; Winkler, Man., slight.

Polygonum Convolvulus L.
*Puccinia Polygoni-amphibii Pers. North Gower, Ont.

Polygonum erectum L.
Puccinia subnitens Diet. Carmen, Man., 1933, slight. This is apparently the first record on this host for Manitoba

Polygonum sp.
* Puccinia Polygoni-amphibii Pers. Scott, Que.

Populus balsamifera L.
* Fusicladium radiosum (Lib.) Lindr. St. Gabriel, Que.
* Melampsora Medusae Thum. Lennoxville, Que.
* Septoria populicola Pk. Kenora and Kemptville, Ont.

Populus nigra L. var. italica du Roi
* Sclerotium bifrons E. & E. Kingsmere, Que.

Populus tremuloides Michx.
Fusicladium radiosum (Lib.) Lindr. Lac du Bonnet, Seddon's Corners and Winnipeg, Man., 1933. Moderate damage.

Populus sp.
* Cenangium populneum (Pers.) Rehm. Constance Bay, Ont.
* Sclerotium bifrons E.& E. Abbotsford, Que.
* Taphrina aurea (Pers.) Fr. Sidney, B.C., on a Russian poplar.
* Tympanis populina (Pk.) Sacc. Forester's Falls, Ont.
* Uncinula Salicis (DC.) Wint. Summerland, B.C.

Portulaca oleracea L.
Cystopus Portulacae (DC.) Lév. Winnipeg, Man., Aug. 31, slight.

Potentilla bipinnatifida Dougl.
Phragmidium Potentillae (Pers.) Karst. Ethelbert, Man., severe infection.

Potentilla canadensis L.
Frommea Potentillae-canadensis Diet. Queens Co., P.E.I.

Prunus pennsylvanica L.f.
Cylindrosporium hiemale Higg. Beausejour, Man., June 16, trace.

Prunus sp.
* Cladosporium carpophilum Thum. Lake Megantic, Que.
* Cylindrosporium prunophorae Higg. On Dumas plum, Ste. Anne de la Pocatiere, Que.
* Dermatea Cerasi (Pers.) de Not. Forester's Falls, Ont.; Cacouna, Que.; Micropera drupaceanum Lév. was present at the base of the apothecia in the latter specimen.
* Dibotryon morbosum (Schw.) Theiss. & Syd. New Westminister, B.C.
* Micropera spuria (Fr.) v. Hoehn. Cacouna, Que.
* Phyllosticta circumcissa Cke. Ile aux Coudres, Que.

Psedera quinquefolia (L.) Greene
* Uncinula necator (Schw.) Burr. Ottawa, Ont.

Pulsatilla patens A. Gray
* Urocystis Anemones (Pers.) Wint. Morden, Man.

Pyrola secunda L. var. obtusa Turoq.
* Chrysomyxa Pyrolae Rostr. Federal Hill, Gaspé, Que.
* Puccinia strum Pyrolae (Pers.) Diet. Federal Hill, Gaspé, Que.

Pyrola sp.
* Chrysomyxa Pyrolae Rostr. Constance Bay, Ont.

Pyrus communis L. (cult.)
* Fusicladium pirinum (Lib.) Fuck. Abbotsford, Que.
* Septoria piricola Desm. Locust Hill, Ont.

Pyrus japonica
Tubercularia vulgaris (Tode) Fr. Arboretum, Ottawa, Ont.

Pyrus Malus L. (cult.)
* Fusicladium dendriticum (Wallr.) Fuck. Abbotsford and Ste. Anne de la Pocatière, Que.
* Myxosporium corticolum Edgert. on Russet apple trees, Abbotsford, Que.
* Phomopsis Mali Roberts, Oka, Que.

* Phyllosticta limitata Pk. Ste. Anne de la Pocatière, and Abbotsford, Que.
* Sphaeropsis Malorum Pk. Abbotsford, Que.

Pyrus Maulei
* Tubercularia vulgaris (Tode) Fr. Arboretum, Ottawa, Ont.

Quercus macrocarpa Michx.
* Gloeosporium canadense E. & E. Abbotsford, Que.

Quercus rubra L.
* Cronartium Quercuum Miyabe, Constance Bay, Ont.

Ranunculus acris L.
Erysiphe Polygoni DC. *Berthierville, Que.; York county, N.B.

Rhamnus alnifolia L'Her
Puccinia coronata Cda. Cowan, Man., slight; Beausejour, trace; Winnipeg, moderate infection.

Rheum Rhaponticum L. (cult.)
* Puccinia Phragmitis Koern. Inwood, Man.

Rhus Toxicodendron L.
Cylindrosporium Toxicodendri (Curt.) E.& E. Cowan, Man., Aug. 11, general

Ribes ?acerifolium Howell
* Cronartium ribicola Fischer, West Summerland, B.C.

Ribes americanum Mill.
Puccinia Pringsheimiana Kleb. Sydney, Man.; severe.

Ribes aureum Pursh
* Cronartium ribicola Fischer, L'Assomption, Que.

Ribes Cynosbati L.
* Cronartium ribicola Fischer, Mt. Burnet, Que.

Ribes Grossularia L. (cult.)
* Cronartium ribicola Fischer, Cap Rouge, Que.
* Sphaerotheca mors-uvae (Schw.) Berk. Dresden, Ont.
* Gloeosporium Ribis (Lib.) Mont. & Desm. Sorrento, B.C.

Ribes lacustre (Pers.) Poir.
* Cronartium ribicola Fischer, South Canoe, B.C.; Billings Bridge, Ont.

Ribes nigrum L.
* Cronartium ribicola Fischer, Ottawa, Ont.; Beebe, Neuville, Que.; Charlottetown, P.E.I.

* Septoria Ribis Desm. Indian Head and Saskatoon, Sask.

Ribes oxycanthoides L.
* Gloeosporium Ribis (Lib.) Mont. & Desm. Iberville, Que.

Ribes prostratum L'Her
* Puccinia Pringsheimiana Kleb. Federal Hill, Gaspé, Que.

Ribes triste Pall.
* Puccinia Ribis DC, Lake Waskesiu, Sask.

Ribes vulgare Lam.
* Gloeosporium Ribis (Lib.) Mont. & Desm. Iberville, Que.

Rosa blanda Ait.
Cercospora rosaecola Pass. Kelwood, Man., heavy infection.
* Phragmidium speciosum (Fr.) Cke. Belleville, Ont.

Rosa sp.
Phragmidum speciosum (Fr.) Cke. *Scott, Sask.; Glenmont, N.S., July 22, severe infection.
* P. americanum Diet. Abbotsford, Que.
* Hendersonia Rosae Kickx. Ottawa, Ont.
* Coryneum microstictum Victoria, B.C., on hybrid tea rose.

Rubus Idaeus L. (cult.)
* Septoria Rubi West. Emileville and Aylmer, Que.
* Tubercularia vulgaris (Tode) Fr. Edmonton, Alta.

Rubus odoratus L.
* Septoria Rubi West. Kingsmere, Que.

Rubus parviflorus Nutt.
* Phragmidium occidentale Arth. Peachland and Enderby, B.C.

Rubus pubescens Raf.
Septoria Rubi West. Morden Man., moderate infection.

Rubus sp.
* Asterina rubicola Ell. & Ev. Summerland, B.C.
* Coniothyrium Fuckelii Sacc. Eastview, Ont.
* Phragmidium Rubi-Idaei (DC.) Karst. South Canoe, Peachland, and West Summerland, B.C.
* Pucciniastrum americanum (Farl.) Arth. South Canoe, B.C.; Abbotsford and Chelsea, Que.

Rudbeckia laciniata L.
Erysiphe Cichoracearum DC. Dauphin, Man., slight infection; * Ottawa, Ont.

Plasmopara Halstedii (Farl.) Berl. & de Toni, Lac du Bonnet, Man., slight infection.
Uromyces perigynius Halst. Brandon, Man., severe infection.

Rumex obtusifolius L.
* Ramularia circumfusa E.& E. Kingsmere, Que.

Russula sp.
* Hypomyces hyalinus (Schw.) Tul. La Salle woods, Montreal, Que.

Saggitaria latifolia Willd.
* Doassansia deformans Setch., Ottawa, Ont.

Salix sp.
* Fusicladium saliciperdum (All. & Tub.) Tub. Lennoxville, Que.
* Gloeosporium Salicis West. Neuville, Que.
Melampsora Bigelowii Thum. *Enderby and West Summerland, B.C., Reniver, Man., Aug. 11, moderate infection.
* M. Humboldtiana Speg. South Canoe, B.C.
* Ocellaria ocellata (Pers.) Schroet. Ottawa, Ont.
* Trimmatostroma americana Thum. M.A.C., Winnipeg, Man.
* Uncinula Salicis (DC.) Wint. Armstrong, South Canoe, and Summerland, B.C.; M.A.C., Winnipeg, Man.; Lennoxville, Que.

Sanicula marilandica L.
* Puccinia marylandica Lindr. Kingsmere, Que.

Senecio aureus L.
* Cystopus cubicus (Strauss) Lév. Anticosti island, Que., Aug. 1933. (J. Adams)

Setaria viridis (L.) Beauv.
* Sclerospora graminicola (Sacc.) Schroet. Oxbow, Sask.

Setaria sp.
* Sclerospora graminicola (Sacc.) Schroet. Indian Head, Sask.

Shepherdia canadensis (L.) Nutt.
* Puccinia coronata Cda. Salmon Arm, B.C.
* Sphaerotheca Humuli (DC.) Burr. Tachie, B.C.

Smilacina racemosa (L.) Desf.
* Cylindrosporium Smilacinae E.& E. Kingsmere, Que.

Soja max Piper (cult.)
* Pseudomonas glycinea Coerp. Indian Head, Sask.

Solidago canadensis L.
Coleosporium Solidaginis (Schw.) Thum. Common in York and Sunbury counties, N.B.

Solidago gilvocanescens (Rydb.) Smyth
Puccinia extensicola Plowr. Coulter, Man., June 6, common.

Solidago macrophylla Pursh
*Coleosporium Solidaginis (Schw.) Thüm. Federal Hill, Gaspé, Que.
*Puccinia extensicola Plowr. Federal Hill, Gaspé and Kingsmere, Que.

Solidago nemoralis Ait.
*Coleosporium Solidaginis (Schw.) Thüm. Elgin, Ont.
*Puccinia Stipae Arth. Brandon, Man.

Solidago rugosa Mill.
*Darluca Filum (Biv.- Bern.) Cast. on Coleosporium Solidaginis (Schw.) Thüm. Berthierville, Que.
*Puccinia extensicola Plowr. Lennoxville, Que.

Sonchus arvensis L.
Several plants were seriously injured by a disease of the mosaic or yellows type at M.A.C., Winnipeg, Man. (G.R. Bisby)
A single plant found affected by yellows (virus) near Keswick, N.B. (D. J. MacLeod)

Sorbus americana Marsh.
*Entomosporium maculatum Lév. Mt. Carmel and Ste. Anne de la Pocatière, Que.
*Gymnosporangium clavipes Cke. & Pk. Ste. Anne de la Pocatière, Que., Aug. 7, (E. Campagna). No record of the occurrence of the above species on Sorbus has been found. (I. L. Conners)

Sorbus intermedia
*Coniothyrium pirina Sacc. Arboretum, Ottawa, Ont.

Spiraea discolor Pursh.
Phyllactinia corylea (Pers.) Karst. General at Saanichton, B.C., Sept. 1933.

Stellaria longipes Goldie
*Puccinia Arenariae (Schum.) Wint. Vonda, Sask.

Stieronema ciliatum (L.) Raf.
Puccinia Distichlidis Ell. & Ev. Bede, Man., 1933, moderate infection.
Septoria conspicua E. & M. Kelwood, Man., severe.

Stipa comata Trin. & Rupr.
*Ustilago hypodytes (Schl.) Fr. Vonda, Sask., Aug. 17.,

50-75% of the plants were infected around a lake.

Symphoricarpos occidentalis Hook.
Puccinia Crandallii Pamm. & Hume, *Pike Lake, Sask.; Strathclair, Man., slight.
Septoria Symphoricarpi E.& E. Cartwright, Man.

Symphoricarpos racemosus Michx.
*Puccinia Symphoricarpi (Hark.) Arth. & Jack. West Summerland, B.C.

Syringa vulgaris L.
* Microsphaera Alni (Wallr.) Salm. Ottawa, Ont.; Beebe, Que.
* Phyllosticta Syringae West. Beebe, Que.

Taraxacum officinale Weber
Puccinia Hieracii (Schum.) Mart. *South Canoe, Vernon, Enderby, B.C.; general occurrence in Manitoba.
Sphaerotheca Humuli (DC.) Burr. var. fuliginea (Schlecht.) Salm. Vancouver island, B.C., October, common.

Thalictrum alpinum L.
* Puccinia Clematidis (DC.) Lagerh. Anticosti island, Que. (J. Adams) Aug. 1933.

Thalictrum dioicum L.
Puccinia Clematidis (DC.) Lagerh. Mather, Man., June 5, common.

Thalictrum ?sparsiflorum Turcz.
* Puccinia Clematidis (DC.) Lagerh. Peachland, B.C.

Tilia vulgaris Hayne
* Gloeosporium Tiliae Oud. Halifax, N.S.

Triticum aestivum L.
* Claviceps purpurea (Fr.) Tul. Springside, Sask., on Reward wheat.
* Puccinia triticina Erikss. Andrewsville, Ont., on Huron wheat.
* Septoria nodorum Berk. Yorkton, Sask.

Tsuga canadensis (L.) Carr.
* Thekapsora Vacciniorum Karst. Cloud Lake, Kings county, N.S. July 9.

Ulmus sp.
* Gnomonia ulmea (Schw.) Thüm. Ottawa, Ont.
* Taphrina Ulmi (Fuck.) Johans., Berthierville, Que.

Urtica sp.
* Puccinia Urticae Lagerh. Pike Lake, Sask.; Point Pelee National Park, Ont.

Vaccinium ?corymbosum L.
Exobasidium Vaccinii Wor. Cloud Lake, Kings Co., N.S.

Vaccinium macrocarpon Ait.
* Synchytrium Vaccinii Thomas, Port Mouton, N.S., July 5, common in this bog (W.S. Blair)

Vaccinium sp.
Calyptospora Goeppertiana Kühn, Rawdon, N.S., Aug. 1. Single plant seen affected.

Verbena hastata L.
* Septoria Verbenae Gerard, Beebe, Que.

Viburnum Opulus L. var. americanum (Mill.) Ait.
* Microsphaera Alni (Wallr.) Salm. Ste. Anne de la Pocatière, Que.

Vicia Cracca L.
* Uromyces Fabae (Pers.) de Bary, Abbotsford, Que.

Vicia sparsifolia Nutt.
* Peronospora Viciae (Berk.) de Bary, Prud'homme, Sask.
* Uromyces coloradensis Ell. & Ev. Prud'homme, Sask.

Vicia villosa Roth
* Ascochyta Viciae Lib. South Canoe, B.C.
* Ovularia Schwarziana Magn. East Kelowna and South Canoe, B.C.

Vitis sp.
* Plasmopara viticola (B. & C.) Berl. & de Toni, Constance Bay, Ont.

Viola canadensis L.
* Puccinia Violae (Schum.) DC. Kingsmere, Que.

Viola tricolor L.
* Ramularia agrestis Sacc. Sidney, B.C.

Viola sp.
Puccinia Violae (Schum.) DC. Knowlton, Que.

Wisteria chinensis Sweet
Phyllosticta Wistariae Sacc, Beebe, Que.

Yucca sp.
Coniothyrium concentricum (Desm.) Sacc. Agassiz, B.C.

Zea Mays L.
* Puccinia Sorghi Schw. North Gower and Ottawa, Ont.; Aylmer, Que.

MISCELLANEOUS FUNGI

Aleuria aurantia Fuck. on ground, Chelsea, Que.
Delitschia furfuracea Niessl, on rabbit dung, Long Point, Man., June, 1932 (Coll. Wm. Gussow, det. E.S. Dowding)
Fimetaria fimicola (Rob.) Griff. & Seav. on cariboo dung, Maguish, N.W.T. (Coll. Wm. Gussow, det. E.S. Dowding)
Hypomyces lactifluorum (Schw.) Tul. Clova, Que.
Hypomyces (near) polyporinus Pk. apparently on some wood-destroying basidiomycete on logs, La Salle woods, Montreal, Que. (coll. H.A.C. Jackson, det. Ruth Macrae).
Hypoxylon rubiginosum (Pers.) Fr. on an old stump, M.A.C., Winnipeg, Man.
Lamprospora trachycarpa (Curr.) Seav. on greenhouse benches, Ottawa, Ont. (det. Irene Mounce)
Peziza repanda Pers. on ground, Ottawa, Ont.
Pilobolus Kleinii (sporangia) on horse dung. Ottawa, Ont. (E.S. Dowding)
Pilobolus longipes van Tiegh. (sporangia) on horse dung, Ottawa, Ont. (E.S. Dowding)
Plectania floccosa (Schw.) Seav. on dead wood, Montreal, Que.
Scodellina auricula (Schaeff.) Seav. L'Islet Co., Que.
Scodellina Leporina (Batsch) Gray, on ground, North Saanichton, B.C.

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 of "Diseases of Miscellaneous Plants" may be consulted.