B. J. Sallans

DOMINION OF CANADA

DEPARTMENT OF AGRICULTURE

EXPERIMENTAL FARMS BRANCH

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TENTH ANNUAL REPORT ON THE PREVALENCE OF PLANT DISEASES IN THE DOMINION OF CANADA 1930

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FOREWORD

The tenth annual report on the prevalence of plant diseases in Canada differs little in appearance from previous reports, but I believe its worth and usefulness has been greatly increased. Our collaborators responded wholeheartedly to the request that they forward their observations by November 15. The early receipt of their material has permitted me to issue the report for 1930 at this time, before field observations for the current year have begun. There has also been a marked increase in the data presented. Not only a large number of isolated observations were reported, but for many of the more important diseases the observations were often summarized by the collaborator before they were submitted to me. These summaries have greatly reduced the labour of compilation, and they crystalize many observations of the man in his own territory, which otherwise would be unrecorded.

As in previous years, I have compiled this report almost entirely from the records presented by our collaborators, whom I sincerely thank for their co-operation. The thorough-going summaries prepared by Drs. A. W. Henry, G. B. Sanford and P. M. Simmonds and their assistants for Alberta and Saskatchewan were particularly valuable. I am again indebted to Mr. R. C. Russell and other of the Dominion Laboratory of Plant Pathology at Saskatoon for their records of parasitic fungi on many native hosts.

An innovation has also been made in reporting the distribution of plant diseases in the Prairie Provinces. Where the disease was known to be widely distributed over the Province its distribution was often indicated in terms of the province as a whole. Where a disease was of less common occurrence it was customary to give the town or towns near where collections had been made. It was evident that a geographical unit between these extremes would be useful. However, as the political divisions were unsuitable, it was decided for the plant disease survey to divide the provinces into zones based primarily on soil type. Differences due to elevation and geographical position were also taken into account in dividing up some of the areas that are essentially of one soil type. These zones have been named and notes on the nature of the soil, etc., has been kindly supplied by the Soils Departments of the Provincial Universities. This information is given below. Outline maps showing the Plant Disease Survey Zones were printed on the back of the plant disease summary cards, which are in use in these provinces. These maps are reproduced in fig. 1, p.2 (Manitoba); fig. 2, p.6 (Alberta) and fig. 3, p.26 (Saskatchewan). In the map of Saskatchewan the divisions used by the Provincial Department of Agriculture are also shown, while in Alberta the major soil zones are indicated.

I have been assisted in the preparation of this report by Mr. E. A. Eardley.

March 1931,
Division of Botany,
Ottawa, Canada.

I. L. Conners,
Plant Pathologist.

PLANT DISEASE SURVEY ZONES

MANITOBA

1. Red River Valley:- Heavy clay with high organic content, high lime, heavy textures prevailing, moist, frequently poorly drained. Wheat.

2. Carberry-Morden:- Sand and silt loam, with moderately low organic content, calcareous, relatively high texture, generally well drained, inclined to drought in dry seasons. Sand dunes in central portion. Wheat.

3. Brandon-Boissevain:- Undulating till loam plain, sandy with moderate organic content, calcareous, surface soil more or less eroded in higher positions, frequently saline in low positions, cooler than (1) and (2) owing to altitude. Wheat.

4. Deloraine:- Mixed to short grass prairie plain, sandy with moderate organic content, calcareous, lighter texture than (3), well drained, subject to periodic droughts, lower than (3). Wheat.

5. Roblin-Minnedosa:- Undulating boulder till, formerly prairie undergoing tree invasion; sandy with moderate organic content (except islands of old woodland); low positions frequently saline; islands of old woodland, acid; sloping westward, moderately cool. Oats.

6. Virden-McCauley:- Delta sand area containing sand dunes, low organic content, high lime inclined to drought.

7. Grandview-Neepawa:- Bench land at foot of Riding Mountain, receiving constant additions of eroded material from the mountains; soil varied with high organic content; high lime, moderately deep heavy loam frequent, well drained, lower than land to west, and warmer than (5). Wheat.

8. Swan River Valley:- Valley plain moderately high organic content, formerly wooded, soil variable in texture, moderately moist, low altitude, warmer than (5). Wheat.

9. Unclassified Area:- Poorly drained plain containing a variety of soils-rendzina, salines, peat with wooded lands, rock out-crops, and some lakes. In general not suited to agriculture.

10. Porcupine Mountain:- Same as (10) for Saskatchewan.

SASKATCHEWAN

1. Indian Head-Alameda:- Average loam, organic matter high, lime high, moisture good. Wheat and other cereals.

2. Moose Jaw-Estevan:- In general a heavy clay loam, organic matter moderate, limy, moisture low. Wheat and other cereals.

3. Swift Current:- Much heavy soil and some sandy soil, organic matter low, limy, moisture low. Wheat and other cereals.

4. Govenlock:- Light soils, organic matter low, lime high, moisture low. Rye and corn, etc.

5. Cypress Hills:- Loam soil, organic matter high, limy, moisture good. Rye and corn, etc.

6. Leader-Maple Creek:- Same as (4).

7. Humbolt-Yorkton:- Average loam, organic matter high, lime high, moisture good, increasing towards north. Wheat and other cereals.

8. Swan River Valley:- Same as (8) for Manitoba.

9. Biggar-Saskatoon:- Intermediate loams, organic matter moderate, limy, moisture moderate. Wheat and other cereals.

10. Ste Brieux-Hyas:- Loam soil, organic matter low, lime not high, moisture good. Oats and other cereals.

11. Battleford-Prince Albert:- Loam to silty clay loam, organic matter high, limy, moisture good. Oats and other cereals.

12. Canwood-Cumberland House:- Same as (10).

13. St. Walburg-Big River:- Same as (10).

ALBERTA

1. Medicine Hat-Prairie:- Scanty rainfall. Elevation 2400-3000 ft. Open territory.

2. Lethbridge-Cardston:- Soil variable. Heavy dark brown silty loam in eastern and northern sections to loam with higher organic content in the Cardston-Pincher Creek strip. Rainfall fair in east to good in the west. Elevation 3000-3700 ft., westward. Open territory.

3. Gleichen-Nobleford:- Dark brown silt to sandy loam. Rainfall better than (1), often light, Elevation 3000-3400 ft. Open territory.

4. Claresholm-High River:- Darker brown than in zone 3. Fairly high in organic content. Rainfall usually fair to good. Elevation 3400 to about 3500 ft. Average about 3500 ft. Open territory.

5. Empress-Hanna:- Variable, sandy to light loam. Rainfall usually light, Elevation 2200 ft. in the south to 2500 ft. in the north. Open territory.

6. Drumheller-Calgary:- Variable from silt to dark sandy loam with fair organic content in local areas. Large clay soil district adjacent to Drumheller. Rainfall annual average about 15 ins. Elevation varies from 2700 ft. in the east to about 3400 ft. at Calgary. Average elevation about 3000 ft. Open territory.

7. Foot-Hills:- Drift material, sand, silt and clay. Elevation 3000 ft. Wooded.

8. Castor-Wainwright:- Brown sandy soil predominating. Sandy areas common. Rainfall less than in zone 6, but more than in zone 5. Elevation 2200 ft. in the north to 2700 ft. in the south. Park and open territory.

9. Lloydminster-Vegreville:- Soil with fairly high organic content predominating. Rainfall average slightly more than in (8), but usually less than in (10). Elevation about 2000 ft. Parkland.

10. Olds-Red Deer-Camrose-Edmonton:- Generally high organic content. Rainfall annual average approximately 17 ins. Elevation varies from 3400 at Olds to 2400 at Camrose and 2200 ft. at Edmonton. Typical parkland.

11. Stony Plain-Edson:- Drift material with frequent patches of dark brown to black soil in local areas. Rainfall similar to that in (10). Elevation 2300 at Stony Plain and 3000 ft. at Edson. General poplar bush.

12. Athabasca:- Drift material with small local areas of darker soil with more organic content. Rainfall usually less than in (10). Elevation about 1700 ft.

13. Grande Prairie-Peace River:- Large local areas contiguous to Peace River and Grande Prairie with good agricultural soil, fairly high organic content. Adjoining areas mostly characteristically wooded soils. Rainfall less than in (10), average about 16 ins. Elevation 2300 ft.

DISEASES OF CEREAL CROPS

WHEAT

STEM RUST - Puccinia graminis Pers.

B.C.-

Only a slight amount of stem rust was present on Vancouver island and in the lower Fraser valley.

Alta.-

Stem rust was first collected on August 31, just as the crop was mature (G. B. Sanford). Afterwards some of the late crop in Plant Disease Survey zone 9 was found slightly rusted. Late volunteer plants in southern Alberta were similarly affected. Stem rust was observed in 24 fields out of 702 examined, being present in zones 2,4 and 8-10. It caused no appreciable damage. (For an explanation of the Plant Disease Survey Zones established for the 3 Prairie Provinces see the Foreword).

Sask.-

The first collection of stem rust was made at Indian Head on July 11, when a single infected plant was found. By July 15 rust could be found as far north as Wadena and on July 26, it was reported from Pontrillas, 60 miles north of Saskatoon.

In Saskatchewan the rust situation was similar to that in Manitoba. Rust infection in the drier areas was very light, while in the heavier crop regions stem rust was abundant. Infections from 50 to 80 per cent were reported on common wheat throughout the area from Indian Head to the Manitoba boundary; 50 to 100 per cent from the Manitoba boundary to Melville, where the crops were, in general, late; and 25 to 50 per cent from Melville west to Qu'Appelle. From Moosomin southward rust infections became progressively lighter, ranging from 20 to 40 per cent about Carnduff and Estevan. Westward towards Weyburn infections became still lighter; in this district the rate of infection was less than 20 per cent. Only traces of rust were found in the Saskatoon area and infections were light throughout western Saskatchewan. No estimate of the damage caused by rust was made.

On durum wheat infections ranged from a trace to 15 per cent.

Man.-

Stem rust was quite prevalent on common wheat throughout the whole of Manitoba and was fairly heavy in all sections of the province except the south west corner, which suffered from lack of precipitation. The drought had served to check the progress of the rust to such an extent that losses in that area were estimated to be not more than 3 per cent. In all districts of the province outside the dry

Wheat

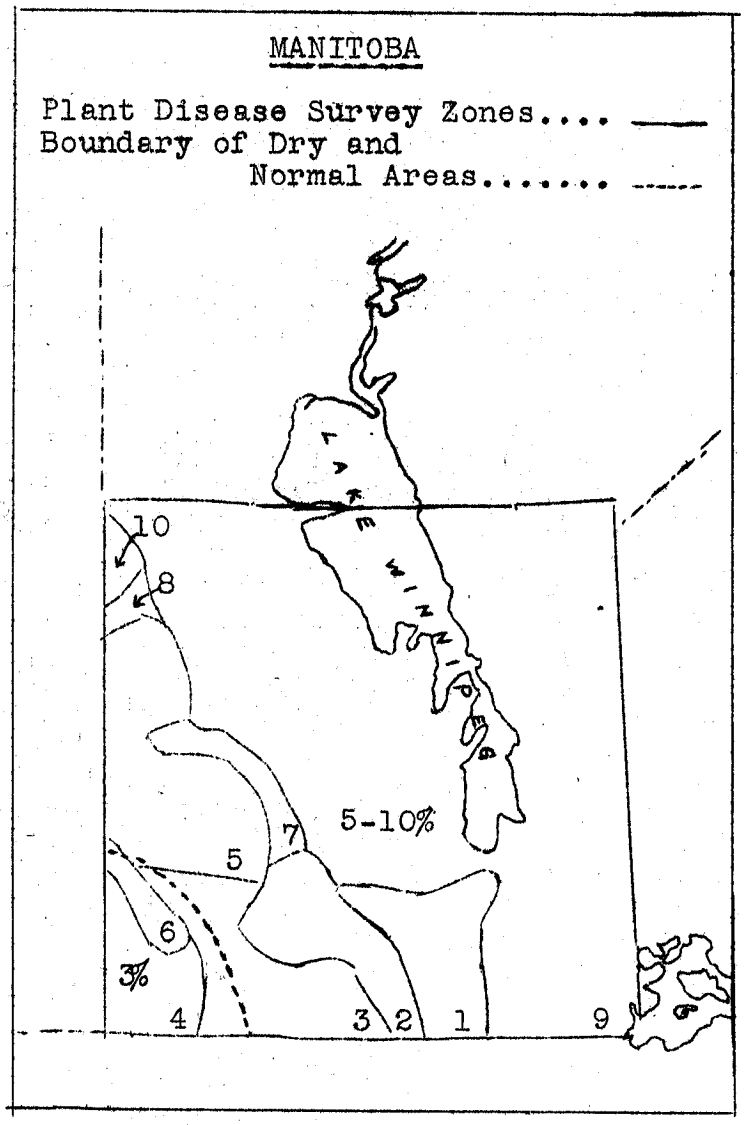

Fig. 1 Prevalence of stem rust in Manitoba in 1930.

area, stem rust losses were estimated to be 5 to 10 per cent of the crop. The severity of the rust in particular fields varied widely with the rankness of growth and the lateness of maturity. Early thin stands were only slightly affected while in fields, where the crop was heavy and late, it was invariably heavily infected and severely damaged by rust, both the grade and yield of grain being lowered. (See Fig. 1).

Weather conditions were favourable for the development and spread of stem rust, from the time of its appearance in June until the latter part of July. A period of hot, dry weather, which began then and extended into August, greatly hastened the maturity of the crop and to some extent retarded the further advance of stem rust. The rust, however, had become too firmly established to be materially checked by a few days of adverse weather conditions.

Stem rust was first observed on wheat on June 26, at Winkler, where several culms were found affected, each bearing a single pustule. A careful survey of the Red River valley at that time failed to reveal additional infections. Traces of stem rust were found on July 3-5 throughout the southern part of Manitoba as far west as Regent. Secondary infections of stem rust were present on July 8 in the Red River valley. Traces of rust were found north of Portage la Prairie on July 10, and as far north as Roblin on July 17. Stem rust became steadily more prevalent, first in the Red River valley, and then throughout the province reaching the proportions indicated in the first paragraph.

Only slight traces of stem rust developed on durum wheat; the infection was not sufficiently heavy to cause measurable damage.

Ont. -

Stem rust was fairly light in southern Ontario. It was also light in the Experimental plots at Ottawa, the infection being about 10 per cent.

Que.-

In Kamouraska and l'Islet counties stem rust infections were about 10 per cent on Marquis and 10 to 20 per cent on Huron.

P. E. I.-

Only traces of stem rust were present on the early maturing crops, while it was abundant, causing appreciable damage, in late fields of wheat.

LEAF RUST - *Puccinia triticina* Erikss.

B.C.-

Slight infections of leaf rust were observed on Vancouver

Wheat

island and in the lower Fraser valley.

Alta.-

Secondary infections of leaf rust were found on winter wheat at Claresholm as early as April 10, by Dr. Sanford. In these fields he believed that the rust had overwintered.

Only traces of leaf rust were found in 14 fields out of 702 examined in August. The fields were located in zones 2-4, 9 and 10.

Sask.-

Only a slight infection of leaf rust was reported. The first recorded infection was observed on June 25 at Saskatoon. Leaf rust had begun to spread by this date in south-eastern Saskatchewan.

Man.-

Leaf rust was first collected at Treesbank. Primary infections occurred early and by July 8 the rust was fairly prevalent on common wheat throughout southern Manitoba. It became very abundant in central and southern Manitoba at the close of the growing period, the degree of infection ranging as high as 90 per cent, with 100 per cent of the plants infected. The losses from leaf rust are included in the estimated losses from stem rust. Durum wheat was only slightly infected.

Ont.-

Leaf rust was present in rather limited quantities in southern Ontario. On the other hand it was prevalent in Carleton county. An average infection of 40 per cent was common on Marquis and Huron, by July 15. At Kemptville, in Grenville county, 60 to 100 per cent of the leaf surface of Kharkov, a winter variety, was rusted by July 5.

P.E.I.-

Leaf rust was abundant on Huron, causing some premature withering of the leaves.

STRIPE RUST - *Puccinia glumarum* (Schm.) Erikss. & Henn.

Alta.-

Stripe rust was found on wheat in southern Alberta only, in 16 fields out of 711 inspected. Fairly heavy leaf infections were noted in several fields of Red Bobs and Kitchener. It was also collected on Marquis. Stripe rust was found in both southern and central Alberta on *Hordeum jubatum*, being observed in 46 locations out of 96 inspected. The rust was more abundant in southern Alberta, appearing first in June, but it was also present in central Alberta by September. No collections were made on *Agropyron tenerum*, *A. Smithii* and *A. dasystachyum*. Stripe rust was also collected at Windermere, B. C.

Wheat

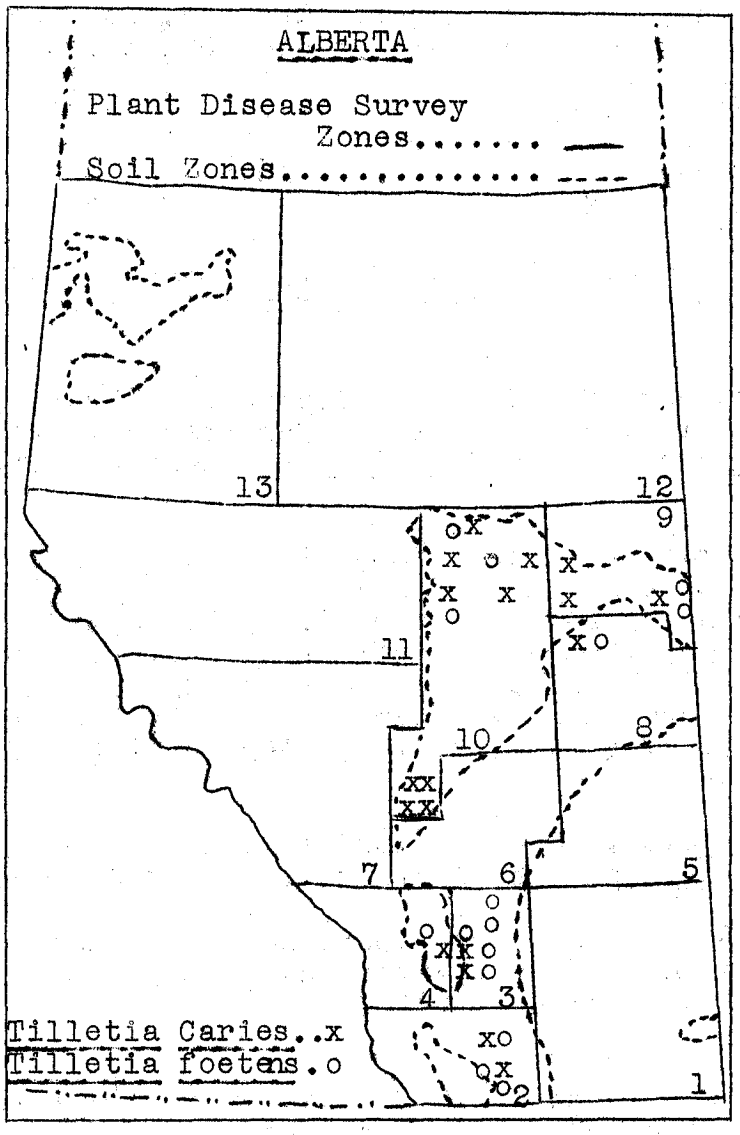

Fig. 2. Prevalence of Tilletia Caries and T. foetens in Alberta in 1930.

LOOSE SMUT - Ustilago Tritici (Pers.) Jens.

B.C.-

Slight infections of loose smut were found on Vancouver island and the lower Fraser valley.

Alta.-

Loose smut was comparatively rare this year. Traces were found in 11 fields out of 702 examined. The heavy infection in Reward wheat in 1928 has tended to disappear in the last two years. By actual count the highest infection observed in this variety was 3/10 of one per cent according to Dr. Sanford.

Sask.-

Out of about 360 fields examined, 42 showed traces of loose smut, while in 9, infections ranged from 1 to 5 per cent.

Man.-

Loose smut was found in 88 out of 115 fields, causing an estimated average loss of 0.6 per cent. This figure may be somewhat too high as Reward wheat was more severely affected than other varieties, while the acreage devoted to this variety was comparatively small.

Ont.-

In southern Ontario loose smut was very heavy on Dawson's Golden Chaff and Imperial Amber. It apparently is becoming more serious. In Carleton county loose smut was comparatively heavy. Infections ranged from a trace to 7 per cent, being particularly heavy on Huron. Practically every field showed at least a trace.

Que.-

Loose smut was observed in Kamouraska and l'Islet counties, infections varying as follows: Marquis 2-5 per cent; Huron 3-10 per cent. Out of 20 fields of Huron examined none were free from smut.

BLACK CHAFF - Pseudomonas translucens J.J. & R. var. undulosa J.J. & R.

Alta.-

Only one definite case of black chaff was observed. A discoloration of Reward wheat, which superficially resembles black chaff, is apparently not caused by the black chaff organism (G. B. Sanford). (See 1929 Report p. 7).

Sask.-

Black chaff was observed in the University plots, Saskatoon, especially on hybrid plants. The disease was patchy and light,

causing practically no damage.

Man.-
Black chaff was not common this year; a trace was found in several fields. In a field near Morden, however, 90 per cent of the plants were severely infected.

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

Alta.-
Basal glume rot was present in 20 fields out of 702 examined. In most fields, only a trace of infection was recorded, but in 2 fields 50 per cent of the plants were affected.

Sask.-
The disease was found in only 3 fields, the damage being merely a trace in every case.

Man.-
Traces of basal glume rot were found in 9 fields in zone 1.

P.E.I.-
Glume blotch was observed, causing 10 to 25 per cent infection on Red Fife and Huron respectively. The damage was moderate. (This report should be under Glume Blotch, page 12.)

ERGOT - Claviceps purpurea (Fr.) Tul.

B.C.-
A very slight amount of ergot occurred on Vancouver island and in the lower Fraser valley.

Sask.-
Traces were found on wheat in several parts of the province, but it was relatively rare and of little economic importance this year.

N.B.-
A single infected plant was found in York county.

P.E.I.-
A trace was observed on Huron wheat.

POWDERY MILDEW - Erysiphe graminis DC.

B.C.-
Heavy infections on wheat occurred at the Experimental

Farm, Saanichton. The damage was nil.

Alta.-

Dr. Sanford reported that a trace of powdery mildew could always be found if a careful examination was made. Sometimes the infection was heavy, but no damage from the disease could be detected. Powdery mildew was reported less frequently by Dr. Henry; he also found it causing no damage.

Sask.-

A fairly heavy infection of powdery mildew was reported on the lower leaves of winter wheat in the University plots, Saskatoon. The damage was probably slight. It was also severe on several plots of spring wheat.

Ont.-

The lower leaves on several varieties were heavily infected in the Experimental Farm plots, Ottawa. A medium infection of the lower leaves of Kharkov, a winter wheat was noted at Kemptville.

P.E.I.-

A trace was observed at the Experimental Station, Charlottetown.

FOOT AND ROOT ROT

The foot and root rot diseases of wheat are considered together as the records that were submitted frequently discussed all these diseases as a unit, with special reference here and there to specific pathogens.

B.C.-

Take-all (*Ophiobolus graminis* Sacc.) was serious in a number of districts.

Foot rot (*Helminthosporium sativum* P.K. & B.) caused considerable damage in certain districts.

Alta.-

As in 1929, damage from foot and root rots was difficult to determine in certain areas, where precipitation was light during May, June and early July. The zones where root rot damage was obscured by dry soil conditions were 1, 5, 6, 8 and 10.

Take-all (*Ophiobolus graminis*) was more abundant and more widely distributed than in 1929. It was particularly prevalent in the black soils of zones 9 and 10, although it was present in the adjacent zones and in southern Alberta. It was reported in 60 fields out of 286 examined (A. W. Henry).

Wheat

The total damage from take-all was decidedly greater in 1929, particularly in zones 2, 4, 9 and the eastern portion of 11 (G. B. Sanford).

Regarding the root rotting organisms Dr. Sanford said "As usual Helminthosporium sativum, Fusarium spp., Wojnowicia graminis (McAlp.) Sacc. & D. Sacc. and Leptosphaeria herpotrichoides de Not. were general over Alberta." Combining the root rot caused by Ophiobolus graminis and Helminthosporium sativum he found 277 fields diseased out of 416. The estimated average damage for all fields was 2 per cent. In fields, where the disease was more than a trace, the average damage was placed at 5.8 per cent. Zones 12 and 13 were not surveyed. Leptosphaeria herpotrichoides was definitely identified in 5 collections of root rot.

Foot rot in Alberta, aside from take-all, appeared to be primarily caused by Helminthosporium sativum and Fusarium spp. according to Dr. Henry, although Leptosphaeria herpotrichoides and Wojnowicia graminis were also present. He reported foot rot in 163 fields out of 286 examined. It was most prevalent in zones 2-4 and 10. The estimated average damage for all fields was 0.27 per cent.

Sask.-

Take-all (Ophiobolus graminis) was found in 87 fields out of 483 examined. The severity of infection was estimated as follows: a trace (less than one per cent), 65 fields; light (1-5 per cent), 14; moderate (6-20 per cent), 5; and severe (over 20 per cent), 3. In a field in southern Saskatchewan 48 per cent of the plants showed lesions and Ophiobolus mycelium in June. No estimate of damage was made.

Take-all appeared on Kharkov wheat in the University plots, Saskatoon. Take-all patches were scattered through the plots, but caused little damage. Plates of typical Ophiobolus mycelium were present inside the sheaths of the lower leaves, but no perithecia were observed. Instead, mature pycnidia of Wojnowicia graminis were abundant on the take-all plants.

Prematurity blight was found in 9 fields out of 219 examined; only traces were present in the diseased fields.

Browning root rot was reported by Dr. Simmonds, from 144 fields out of 483 examined. The severity of infection was as follows: a trace in 58 fields; light in 19, moderate in 38, and severe in 29.

Browning root rot caused by Pythium spp. etc. was not as severe on spring wheat over the province as a whole as in the wetter season of 1928. It probably was least common and of little

economic importance in the south-west part of Saskatchewan. It appeared to be confined to the crop on summer-fallow. Frequently seventy-five per cent of the plants were attacked causing medium to heavy damage. In severe cases a loss of 10 to 15 bushels per acre is common. Many farmers have reported a lower yield of wheat on summer-fallow than on stubble. The disease is first noticed on the plants when they have reached a height of 4 to 8 inches. The seasonal distribution depends on rainfall and temperature (T. C. Vanterpool).

Browning root rot was also found on Kharkov (winter wheat) on the University plots, Saskatoon. In a "date of seeding" experiment, plants from all "dates of seeding" had as many as one third of their root tips necrotic and packed with Pythium oospores. It was difficult to estimate the damage. This is probably the first report of Pythium on winter wheat in Saskatchewan (T. C. Vanterpool).

Helminthosporium- Fusarium root rot caused by Helminthosporium sativum and Fusarium spp. was found in 440 fields out of 483 examined. The severity of infection was as follows: a trace in 36 fields, light in 32, moderate in 140 and severe in 232. The damage is exceedingly difficult to estimate.

Man.-

Traces of take-all (Ophiobolus graminis) were found in one field in each of the zones 1, 2 and 4.

Root rot caused by Helminthosporium sativum and Fusarium spp. was found in 79 fields out of 124 examined. The average percentage of plants infected by zones were as follows: zone 1, 4 per cent; zone 2, a trace; zone 3, 3 per cent; zone 4, 20 per cent; zone 5, 2 per cent; zone 8, a trace, zone 9, 15 per cent. Although it is difficult to estimate the damage caused by root rot, losses were undoubtedly heavy in zone 4.

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

Alta.-

A single blighted head was found at New Norway by Dr. Henry in August. Material bearing perithecia of Gibberella Saubinetii was collected at Claresholm in April by Dr. Sanford. The fungus was isolated in pure culture from the perithecia.

Man.-

Traces only of head blight were found in zones 1 and 2.

N.B.-

A trace of head blight was found on Garnet wheat in the rod-row plots at the Experimental Station, Fredericton.

Wheat

P.E.I.-

Infections varying from a trace to 100 per cent were observed on Huron and Red Fife in Kent and Prince counties. Appreciable losses from this disease occur each year (R.R. Hurst).

HEAD BLIGHT - Helminthosporium sativum P.K. & B.

Head blight, caused by Helminthosporium sativum, was reported on wheat from Edmonton, Alta. It also caused some spotting of the leaves.

GLUME BLOTCH - Septoria nodorum Berk.

B.C.-

Slight infections of glume blotch were observed.

Alta.

Glume blotch was found in only 16 fields out of 702 examined, wheat being remarkably free from this disease in 1930. Infection rarely exceeded a trace.

Sask.-

Glume blotch was found in only 3 fields. Infection was a trace in each case.

LEAF SPOTS - Cause undetermined.

Alta.-

Wheat affected with leaf spots were reported by Dr. Sanford in 11 fields out of 416 examined. The foliage was remarkably free from leaf spots.

Sask.-

Leaf spots were very prevalent and difficult to identify. Some of the spotting was due to Septoria spp. or bacteria, but in many instances the cause was unknown. Leaf spots were reported in 174 out of about 300 fields examined. The severity of infection was as follows: Trace in 59 fields, light in 8, moderate in 30; and severe in 77.

NEMATODE DISEASE - Heterodera punctata Thorne

This disease was reported twice in Sask. "This nema appears to come from the native sod when it is broken up; it is apparently parasitic and easily destroyed by crop rotation."

(R.C. Russell).

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

Before summarizing the results of field surveys in B. C., Alta., and Sask., data obtained from the records of Western Grain Inspection Division covering western Canada for the three months ending Oct. 31, 1930 are given. The records show that the following percentages of cars graded "Smutty":-

Hard Red Spring	1.7 per cent
Alberta Red Winter	5.5 " "
Durum	16.6 " "
All wheat	2.8 " "

Compared with 1929 there was a marked increase in losses from bunt especially in Hard Red Spring wheat.

B.C.-

There were fairly heavy losses from bunt in winter wheat on Vancouver island and in the lower Fraser valley. Both species of Tilletia were present, T. Caries predominating.

Alta.-

Bunt was unusually common this year and appeared to be more prevalent than in 1929 according to Dr. Henry. It was reported in zones 2-4, 6 and 8-10, in 36 out of 286 fields inspected. The damage was estimated at 1.4 per cent. An examination of the spores showed that both species of Tilletia were equally prevalent and were present in the same territory. (See Fig. 2). The relative prevalence of the species by zones was as follows:

Tilletia Caries, 5 collections in zones 2-4 and 14 in zones 8-10;
Tilletia foetens, 9 collections in zones 2-4 and 6 in zones 8-10.

Dr. Sanford did not report as heavy losses as given above, but he noted that some elevators had reported a considerable number of cars grading "Smutty".

Sask.-

Bunt was found in 10 fields out of 200 examined. The damage was estimated at one per cent.

Que.-

Bunt was found in 4 fields out of about 20 examined in Kamouraska and l'Islet counties. Infections ranged from 2 to 5 per cent in the affected fields.

N.B.-

A single specimen of Tilletia Caries was collected in York county.

OATS

STEM RUST - Puccinia graminis Pers.

Alta.-
Stem rust was exceedingly rare being found in zones 8 and 10 in 3 fields out of 202 examined;

Sask.-
Oats were only slightly rusted in east central Saskatchewan.

Man.-
Stem rust of oats was heavy on late oats in the Red River valley, causing noticeable damage; early oats however yielded well. The average damage was placed at 5 per cent. The average percentage of infection by zone was as follows: 40 per cent in zone 1, and southern part of 9; 20 per cent in 2; 15 per cent in 3; 10 per cent in 5 and 8; and 5 per cent in 4 and 6.

Ont.-
Early varieties escaped heavy infection in southern Ontario. Late varieties, however, were heavily infected resulting in considerable damage.

Que.-
Infection on oats varied from 3 to 10 per cent in Kamouraska and l'Islet counties.

N.B.-
Stem rust was practically absent from the Experimental Station plots, Fredericton. Infection was only a trace.

N.S.-
Only traces of stem rust were observed in a field in Halifax county.

P.E.I.-
Stem rust was absent from the early maturing crop, but it was severe and caused serious damage to late fields.

LEAF RUST - Puccinia coronate Corda

B.C.-
Traces of leaf rust only were found on Vancouver island.

Alta.-
No leaf rust was observed in Alberta.

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

Oats

Man.-

Buckthorn bushes were found rusted at Boissevain, Man., only. In the vicinity of these bushes leaf rust was found on oats about July 8, before its appearance elsewhere. Eventually, leaf rust was general throughout the Red River valley; infections, however, were light, averaging about 5 per cent. The damage was very slight. Rust was scarce in the western half of the province.

Ont.-

Early varieties mostly escaped infection, but all late varieties were heavily rusted in southern Ontario.

Leaf rust was absent or traces only were present in Carleton county, except in fields near cultivated or escaped buckthorns.

The inportance of the buckthorn in initiating epidemics of leaf rust was well illustrated at Antrim, in Carleton county. Two buckthorn hedges about 125 feet long were found bordering the north and south sides respectively of the front lawn of a farm house. These bushes were about 8 feet high although they were kept well trimmed. The owner reported that they were about 50 years old. This was the only cultivated hedge that was located, but numerous escaped bushes were found within a radius varying from a half to one and one half miles from the hedges. All the escaped bushes were located along the fence rows, none were found in the open in the pastures. The bushes were of all ages and heights, varying from young plants 2 feet high to mature ones 8 to 10 feet in height. In several instances the buckthorns were growing intermixed with chokecherry and plum forming almost continuous hedges. The older bushes were actively reproducing themselves except the two hedges which in recent years have been kept trimmed to prevent the setting of seed.

Leaf rust on oats was heavy around the edges of the fields, where buckthorns were growing. Near the buckthorns the crop was often lodged and infected 100 per cent with rust. On the upright plants infection was somewhat less, 60 to 100 per cent of the leaf surface being rusted. From the edge of the field the rust gradually became lighter until at 75 yards, only 25 per cent of the plants were rusted, the affected plants showing a trace to 5 per cent infection. At this point infection became almost stationary. In adjacent fields, without buckthorns along the edges infection often fell to a trace on not over 25 per cent of the plants. Several fields between Antrim and Ottawa were examined the same day for leaf rust. Sometimes no rust was observed and generally less than one per cent of the plants were infected with traces of rust.

Damage caused by leaf rust was not great except close to the buckthorns and might be considered of little importance, but it

should be noted that the present season was not particularly favourable for the development of rust and under conditions ideal for rust development the yield would be seriously reduced.

It might be mentioned that the presence of buckthorn in the Antrim district was discovered by first finding rust on the oats and then noting its severity while walking through the field.

The observations made this year were limited, but they strongly suggest that the buckthorn is entirely responsible for the occurrence of leaf rust and the losses occasioned thereby in eastern Ontario.

N.B.-

Leaf rust was widespread, but caused only moderate damage this season.

N.S.-

Leaf rust caused only slight damage. In several fields no rust was found.

P.E.I.-

Leaf rust was heavy, apparently causing severe injury.

SMUTS

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

B.C.-

Loose smut was general on Vancouver island and in the lower Fraser valley. The damage, however, was slight.

Alta.-

Covered smut is a common and destructive disease in Alberta. It was reported in 15 fields out of 47 examined by Dr. Henry. In one field 35 per cent of heads were destroyed. Without distinguishing the species responsible, Dr. Sanford reported smut infection in 29 out of 155 fields examined. He also collected covered smut on wild oats, Avena fatua, at Granum and Edmonton and on a fatuoid form of Victory at Olds. In some places this smut was rare and its absence was apparently due to proper seed treatment.

Sask.-

Covered smut was reported in 39 fields out of 129 inspected. Infections as high as 10 per cent were observed in several fields. Loose smut was found in 6 fields out of 127 examined.

Man.-

Covered smut appears to be much more prevalent than loose

Oats

smut. It was present in 55 out of 57 fields widely scattered over the province. The estimated average infection was 6.4 per cent.

Loose smut was found in 35 fields out of 45 examined; the average infection was estimated to be 0.5 per cent.

Ont.-

Covered smut was reported on Alaska, O.A.C. 3, Banner, Gold Rain, Abundance, and Victory in southern Ontario. O.A.C. 3, and O.A.C. 72, were very susceptible. Covered smut was present in practically every field examined in Carleton county. The average infection in 11 affected fields was 6.3 per cent; 15 per cent of the heads were affected in 2 fields.

Loose smut was found in Banner, Alaska, O.A.C. 72, Gold Rain, Abundance, O.A.C. 13 and Victory in southern Ontario, Banner was particularly heavily attacked, infections as high as 20 per cent were observed in some fields. O.A.C. 144, Markton and Burt were resistant.

Loose smut was generally less prevalent than covered smut in Carleton county although in one field 22 per cent of the heads were destroyed.

Que.-

In Kamouraska and l'Islet counties loose smut infections varied from 1 to 5 per cent in Banner and 3 to 5 per cent in Alaska. No covered smut was reported.

N.B.-

Covered smut was widespread in York county. In several plots of Victory at the Experimental Station, Fredericton, the average infection was estimated to be 7 per cent.

Seventeen per cent of the heads were destroyed by loose smut in a field of Victory at the Experimental Station, Fredericton. The disease was widespread in York county.

N.S.-

Observations on the oat smuts were made in Halifax and Colchester counties. Infections of covered smut varied from 10 to 20 per cent and those of loose smut from 5 to 20 per cent. In fields, where the infection was high, the seed had not been treated; fields sown with treated seed were free from smut.

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

B.C.-

Halo blight was general on Vancouver island and the lower mainland.

Alta.-

Halo blight was reported by Dr. Henry in 4 fields out of 47 examined, being quite prevalent in zone 10. Dr. Sanford reported that halo blight was apparently common wherever Victory oats were grown. He found halo blight in 35 fields, out of 155 examined, infections ranging from a trace to general.

Sask.-

Halo blight was severe in a field of oats at Armley. The field appeared quite brown from the roadway. The observations were made following a fortnight of rainy weather.

Man.-

Halo blight was observed in one field located in zone 4. One hundred per cent of the plants were severely diseased.

Ont.-

What appeared to be halo blight, affected several varieties, especially Banner, on the Experimental Farm, Ottawa. The infection however, was very uneven, some plots were severely affected while others of the same variety from the same seed lot were free from disease. The location of the plot in the field and the date of seeding seemed to determine the severity of infection. Halo blight was also observed in two fields in Carleton county. About 40 per cent of leaf surface was affected.

N.B.-

A slight infection of halo blight was observed on Victory at the Experimental Station, Fredericton.

FOOT AND ROOT ROT

Sask.-

Prematurity blight was much less common than it has been for some years. One field out of 60 examined was affected and in this field the damage was a trace.

Browning root rot (Pythium sp.) was observed in 2 fields out of 127 examined. The disease was relatively rare in oats this year.

Helminthosporium-Fusarium root rot was present in 81 out of 127 fields, being about as prevalent as last year.

Oats

Man.-

Root rot of oats caused by Helminthosporium sativum and Fusarium spp. was uncommon. It was reported from 3 places, a light infection in 2 and 40 per cent of the plants affected in the third.

BLAST - Non-parasitic.

Alta.-

Oat blast was observed in zones 2-5, 7 and 10, the average percentage of blasted spikelets varying from 2.3 to 12.0 per cent according to the zone. These figures are based on counts of blasted spikelets of representative plants in the field. Out of 155 fields examined 61 were affected. If the blasting of the spikelets reduces the yields, the trouble was sufficiently heavy this year to cause much loss (G. B. Sanford).

Out of 47 fields examined by Dr. Henry, 5 were found affected. The estimated loss was a trace.

Sask.-

Oat blast was reported in 25 out of 127 fields. The estimated average damage was 5 per cent.

N.B.-

Oat blast was widespread and fairly severe on oats. Ninety per cent of the plants were moderately affected in several varieties at the Experimental Station, Fredericton.

P.E.I.-

About 10 per cent of the heads were severely affected in several fields of Banner.

LEAF SPOT - Helminthosporium Avenae Eidam

B.C.-

The disease was general on Vancouver island and the lower Fraser valley. The damage was slight.

N.B.-

A leaf spot attributed to Helminthosporium Avenae was severe on several varieties at the Experimental Station, Fredericton. The disease was widespread.

FALSE STRIPE - Cause unknown.

A disease similar in appearance to the false stripe disease

of barley was observed on a plot of registered Alaska oats, at the Experimental Farm, Ottawa, Ont. All culms of a plant were affected, leaves and leaf sheaths turning pale reddish yellow. Only fungi that were considered secondary were found fruiting on the older leaves. Infection was estimated to be one per cent.

LEAF SPOT - Cause unknown

A leaf spot of oats was reported in 23 fields out of 127 examined in Sask., but light infections were present in many others. Sometimes 80 per cent of the leaves were spotted. No estimate of the damage was made.

ERGOT - Claviceps purpurea (Fr.) Tul.

B.C.-

Oats were occasionally attacked by ergot on Vancouver island and the lower mainland.

Alta.-

Oats were found infected with ergot at Edmonton.

POWDERY MILDEW - Erysiphe graminis DC.

Powdery mildew was general on Vancouver island and the lower mainland. Oats were severely damaged in the seedling stage, but the pathogen was incapable of causing appreciable damage to the maturer plants.

BARLEY

STEM RUST - Puccinia graminis Pers.

Alta.-

Traces of stem rust were reported from zones 8-10.

Sask.-

Stem rust was slightly lighter on barley than on common wheat through east central Saskatchewan.

Man.-

Traces of stem rust were first observed about July 17, on barley in the Red River valley. Within a period of two weeks it had become quite prevalent through central and southern Manitoba. By harvest time barley was heavily rusted especially in the Red River valley. The crop was more heavily rusted than it had been for several years, even when stem rust had been severe on wheat.

Barley

Damage was estimated to be less than 5 per cent.

Ont.-
Most of the barley crop escaped serious infection in southern Ontario. However late sown barley was severely attacked.

N.B.-
General observations indicated that stem rust was widespread. The infection was fairly heavy.

P.E.I.-
Stem rust caused moderate infection of late barley in Queens county.

LEAF RUST - Puccinia anomala Rostr.

B.C.-
Leaf rust was common and quite severe on Vancouver island and the lower Fraser valley.

Man.-
A very light infection of leaf rust of barley occurred throughout southern Manitoba. In many fields 100 per cent of the plants were infected. This rust has never been previously so prevalent in Manitoba.

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

B.C.-
Stripe rust was found only occasionally on Vancouver island.

Alta.-
Stripe rust was collected on O.A.C. 21.

LOOSE SMUT - Ustilago nuda (Jens.) Rostr.

Alta.-
Very little loose smut was present. It was found in 7 fields out of 108 examined in zones 8 and 10. Infections were as follows: 5 fields, a trace; 1 field, 6 per cent; and 1 field, 20 per cent.

Sask.-
Out of 72 fields examined, traces of loose smut were found in 10 and slight infections in 2.

Man.-
Loose smut was found in 22 fields out of 26 examined. The

estimated average damage was one half of one per cent, the disease being most prevalent in zones 1-3.

Ont.-

Loose smut was prevalent in southern Ontario as O.A.C. 21, the most commonly grown variety, is very susceptible. Success is also susceptible. Infections varying from one half to 4 per cent were observed in Carleton county.

N.B.-

Loose smut was general, but it was of little importance in York county.

N.S.-

In the only field of barley examined, 8 per cent of the heads were infected.

P.E.I.-

A trace of loose smut was found in Charlottetown 80 in Queens county.

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

Alta.-

Covered smut was extremely common and destructive. Several fields were observed where the infection was 40 to 50 per cent of the heads. O.A.C. 21 was most frequently affected. Thirty-five out of 108 fields were affected in zones 3-4 and 7-11.

Sask.-

Out of 72 fields examined 12 contained a trace of covered smut; 5, a slight infection; and 2, a moderate infection. About 25 per cent of the heads were smutted in a small Experimental plot at Saskatoon.

Man.-

Covered smut was found in 22 out of 32 fields examined. The estimated average damage was 2 per cent. The average damage by zones was reported as follows: zone 4, 5 per cent; zone 2, 4 per cent; zone 8, 3 per cent; zone 1 and zone 7, 2 per cent; zone 3, 1 per cent and zone 5, a trace. Many farmers have stated that their thrashed barley was heavily contaminated.

Ont.-

Little covered smut was present in southern Ontario. Experiments at the Ontario Agricultural College Farm showed that O.A.C. 21, Lyon, Trebi and Success were resistant to covered smut, while White Hulless, Hanchen, French Chevalier, Plumage and Archer were susceptible.

Barley

One per cent of heads were destroyed by covered smut in a field in Carleton county.

P.E.I.-
Trace of covered smut was observed in Queens county.

STRIPE - Helminthosporium gramineum Rabh.

Alta.-
Stripe was abundant in Experimental plots and it was occasionally severe in fields in the country. In general, however, the damage was slight. Stripe was found in 25 out of 108 fields examined. Infections were as follows: 18 fields showed a trace; 3, slight infection; and 4, heavy. In one of the latter 20-30 per cent of the plants were affected.

Sask.-
Stripe was reported in 3 out of 72 fields examined. Damage varied from a trace to slight. In the University plots, Saskatoon, stripe was most severe on variety "60-day."

Ont.-
Stripe was less prevalent in 1930 than for many years. This fact is attributed to the dry weather following seeding.

N.B.-
Barley stripe was reported as widespread and severe in York county.

FALSE STRIPE - Cause undetermined.

Sask.-
Very little false stripe was observed this year. A few plots in the variety tests at Indian Head were slightly affected.

Ont.-
A trace of false stripe was found in plots of hybrid material at the Experimental Farm, Ottawa.

P.E.I.-
In the rod row plots at the Experimental Farm, Charlottetown 50 per cent of plants were affected.

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

Alta.-
Bacterial blight was observed on Regal and O.A.C. 21 at

Saskatoon. Infections were present on the leaves and culms. It was reported in the general survey of the province in 2 fields out of 72 examined. Five per cent of the plants were infected in one field.

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

Alta.-

A trace of net blotch was found in 15 fields out of 108 examined in zones 7, 9 and 10 only.

Sask.-

Net blotch was found in 55 fields out of 84 examined; in 17 fields there was a trace; in 8 infection was slight; in 11 moderate; and in 19 severe.

Man.-

Net blotch was reported in 9 fields. In general, the infection was a trace in these fields, but spots were found, where the plants were severely infected.

N.B.-

Slight infection of net blotch was reported on O.A.C. 21. The disease was not important this season.

P.E.I.-

Net blotch was present in head row plots at the Experimental Station, Charlottetown, but the crop was not seriously affected.

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

Alta.-

Traces of spot blotch were reported in 2 fields.

Man.-

Traces of spot blotch were found in 2 fields.

FOOT AND ROOT ROT

Sask.-

Traces of take-all were reported in 8 fields out of 96 examined.

Prematurity blight was found once. This disease is rarely found on barley.

Browning root rot (Pythium spp.) was observed in 3 fields out of 98 examined. The disease is usually less conspicuous on

barley than on wheat.

Root rot of the Helminthosporium-Fusarium type was present in 89 fields out of 98 examined. The diseased fields were grouped as follows: Trace, 7 fields; light, 2; moderate, 31; severe, 49.

Man.-

Helminthosporium-Fusarium root rot was reported from 29 fields out of 33 examined. The average percentage of infection by zone was; zone 1, 15 per cent; zone 2, 20 per cent; zone 3, 10 per cent; zone 7, a trace.

Ont.-

Foot rot and spot blotch was severe in the variety plots at the Experimental Farm, Ottawa. All varieties were affected, but 20 and 50 per cent of the plants were killed in the seedling stage in Wash. 238 and Wash. 113 respectively.

HEAD BLIGHT - Fusarium spp.

N.B.-

A trace of head blight was reported on O.A.C. 21 at the Experimental Station, Fredericton.

SCALD - Rhynchosporium Secalis (Oud.) Davis

Alta.-

Scald was reported from 6 fields out of 36 examined. Certain varieties, for example Alberta Beardless, were heavily attacked. In general, however, scald infections were light.

ERGOT - Claviceps purpurea (Fr.) Tul.

Sask.-

A trace of ergot was observed at Rosthern.

N.B.-

A trace was collected in a plot of O.A.C. 21 at the Experimental Station, Fredericton.

POWDERY MILDEW - Erysiphe graminis DC.

Alta.-

A trace was observed on barley.

Ont.-

Powdery mildew was very heavy on barley through southern

Barley

Ontario.

P.E.I.-
A slight infection of powdery mildew was present in Queens county.

RYE

STEM RUST - Puccinia graminis Pers.

Man.-
A trace of stem rust was collected in zones 4 and 5.

LEAF RUST - Puccinia dispersa Erikss.

Sask.-
A trace of leaf rust was found at Indian Head.

Man.-
Leaf rust was quite common in Manitoba this year, but it was not sufficiently heavy to damage the crop.

Ont.-
Traces of leaf rust were observed in Carleton county.

STEM SMUT - Urocystis occulta (Wallr.) Rabh.

Sask.- 1930
An outbreak of stem smut occurred this year. It was found in 19 fields out of 84 examined. The centre of infection was in an area embracing Belcaires, Lemberg and Neudorf, although smut was found also at Mortlach and Fairlight. (See Fig. 3). Infections varied from a trace to 11 per cent. As far as known stem smut has been observed only once previously in Saskatchewan when Dr. Simmonds collected it several years ago.

Man.-
A trace of smut was found in one field near Carman. In 1925 it was collected at Carman and at Emerson, where 10 per cent of the heads was found infected in one field.

ERGOT - Claviceps purpurea (Fr.) Tul.

Alta.-
A trace was found in two fields out of 32 examined.

Sask.-
A trace of ergot was reported in 8 fields of fall rye out

Rye

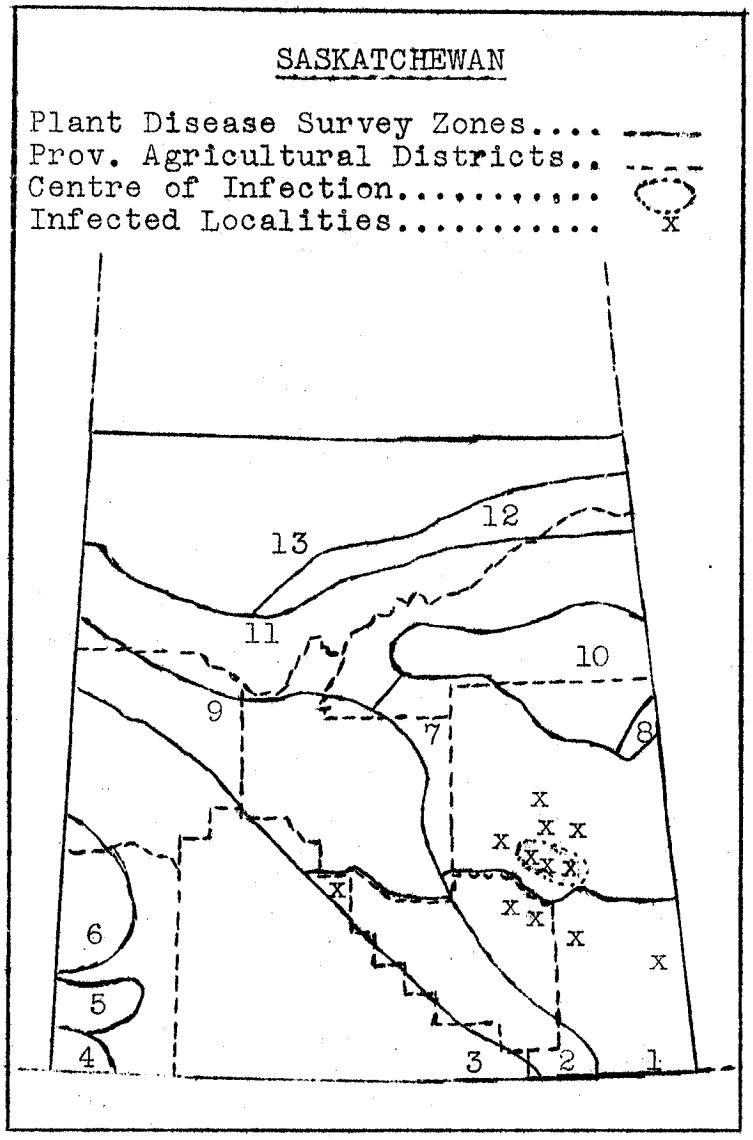

Fig. 3. Distribution of rye smut in Saskatchewan in 1930.

of 88 examined. A trace was also observed in two fields of spring rye.

Man.-

A trace was present in most fields examined. In a field in zone 8, over 1 per cent of the heads were infected.

FOOT AND ROOT ROT

Sask.-

Prematurity blight was found in 2 fields out of 39 examined. The disease is uncommon in rye.

Browning root rot (Pythium spp.) was reported in one field out of 87 examined. Only a trace of infection was found.

Helminthosporium-Fusarium root rot was found in 74 out of 87 fields. The rate of infection was classified as follows; Trace in 3 fields; slight in 4; moderate in 19; and severe in 48.

Man.-

A few infected plants were found in a field in zone 8.

POWDERY MILDEW - Erysiphe graminis DC.

Alta.-

A trace of powdery mildew was reported in one field.

Sask.-

At Ituna a field was found where the lower leaves of the plants were heavily infected with a mixture of powdery mildew and secondary fungi.

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

A bacterial blight of rye culms was fairly common in Saskatchewan. Sometimes the stems were profusely lesioned, but the disease did not appear to be doing much damage. At Saskatoon some plants of fall rye were almost a total loss due to a combination of causes. Dry winds at heading time were followed by hail. The heads were than attacked by a disease similar to black chaff of wheat.

CEREALS

FROST INJURY - Non-parasitic

Ten degrees of frost was recorded by the University observer the night of May 15, at Saskatoon, Sask. The next day seedlings showed purplish to yellow areas on the first leaf, mainly at the point of most rapid growth.

INJURY FROM SOIL DRIFTING - Non-parasitic

A high south-east wind (maximum velocity of 43 miles per hour) blew for one and one half days, May 24 and 25, at Saskatoon, Sask. As a result soil drifting caused severe injury to seedlings in the University plots and to fields in several districts near Saskatoon, notably around Hague and Clavet. Wheat appeared to recover better than other cereals on our plots (R.C. Russell).

CHEMICAL INJURY - Non-parasitic

Patches of cereals of varying sizes were partially or wholly killed out in the seedling stage in Saskatchewan by sodium chlorate present in the soil. The chlorate had been applied to these spots last year to kill the weeds. Similar after effects were noticed following the use of Altacide. The autumn and spring were very dry.

DISEASES OF FORAGE AND FIBRE CROPS

ALFALFA

LEAF SPECK - Pseudopeziza Medicaginis (Lib.) Sacc.

B.C.-
Leaf speck was general on Vancouver island and in the lower Fraser valley, although the damage was insignificant.

Alta.-
The disease was common and sometimes caused severe leaf drop in certain varieties. It was, however, apparently not as prevalent this year as in 1928 and 1929.

Sask.-
A light infection was observed on the leaves of alfalfa in the University plots, Saskatoon.

Que.-
In the fields, where leaf speck was found, in Hull, Sherbrooke and Kamouraska counties 50 to 100 per cent of the leaves were attacked. No noticeable damage was observed.

N.B.-
Several varieties of alfalfa were moderately infected at the Experimental Station, Fredericton.

P.E.I.-
Leaf speck caused some yellowing of the leaves in Queens county.

OTHER DISEASES

ROOT ROT - Sclerotinia Trifoliorum Erikss.
This disease was reported from Pemberton Meadows, B.C.

BACTERIAL BLIGHT - Pseudomonas Medicaginis Sackett
Slight damage was reported from 3 fields in the Lethbridge district (zone 2), Alta. Alfalfa severely affected by a bacterial disease was also found in zone 4.

ASCOCHYTA SPOT - Ascochyta Meliloti (Trel.) Davis
This disease is common, and at times severe, in Alberta. Slight to medium damage was also reported from Saskatoon, Sask. Hail wounds on the stem served as admirable infection courts.

BROWN ROOT ROT - Plenodomas Meliloti Dearn. & Sanford
For injury to alfalfa see under sweet clover.

Alfalfa

WHITE SPOT - Non-parasitic
This disease was reported from Deux Montagnes county, Que.

DOWNY MILDEW - Peronospora Trifoliorum de Bary
Although this disease is of general occurrence in P.E.I. it is not important.

RUST - Uromyces Medicaginis Pass.
Although this rust is of rare occurrence, it apparently caused some injury this year in P.E.I.

COMMON CLOVER

POWDERY MILDEW - Erysiphe Polygoni DC.

B.C.-
General on Vancouver island and in the lower Fraser valley. Damage was severe in some locations.

Alta.-
Out of 10 fields examined, two were found to be infected with mildew. The damage was not heavy although the disease was probably fairly common.

Ont.-
A heavy, general infection caused a reduction of 50 per cent in the crop in Middlesex county.

Que.-
Powdery mildew was heavy on the second growth in Hull and Sherbrooke counties, but it probably caused little damage.

N.B.-
Powdery mildew was severe throughout the province. The damage was not estimated.

N.S.-
In Kings county the second crop of clover showed a considerable amount of late infection, but it was not appreciably injured.

P.E.I.-
Red clover was infected 100 per cent in Queens county. The heavy infection caused the leaves to dry up prematurely and may have been responsible for the failure of the crop to set seed;

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

Alta.-
Light, general infections were reported in fields at Entwistle and at the Experimental Station, Lethbridge.

Ont.-

Rust was observed on alsike clover in Carleton county. Out of 3 fields examined, in one 20 per cent of the leaves were infected, in another 10 per cent and in a third no rust was observed. In the two infected fields small patches were found where not only the leaves, but also the stems were rusted.

N.S.-

Rust appeared to be fairly common, but it apparently caused little loss. Slight infection, was reported from Digby, Pictou and Colchester counties, while a 40 per cent infection was observed in Kings county.

PSEUDOPEZIZA LEAF SPOT - Pseudopeziza Trifolii Fuck.

This disease was fairly common in both Antigonish and Colchester counties, N.S., although the damage was slight. One slight infection was observed in P.E.I.

CERCOPORA LEAF SPOT - Cercospora zebrina Pass.

Cercospora leaf spot was found in 2 fields in Carleton county, Ont., 10 and 50 per cent of the leaves, respectively, being infected.

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

B.C.-

Sooty spot was general on Vancouver island and the lower Fraser valley, although it caused little damage.

N.B.-

A light infection was reported from the Experimental Station, Fredericton.

P.E.I.-

A light scattered infection was observed in Queens county.

DOWNY MILDEW - Perenospora Trifoliorum de Bary

Heavy infections of downy mildew were reported from five fields of clover at Ste. Anne de la Pocatière, Que.

MOSAIC - Virus

Only a very few plants attacked by mosaic, were observed at Fredericton, N.B. A single affected plant, stunted and yellow was found late in the season in Queens county, P.E.I.

SWEET CLOVER

BROWN ROOT ROT - Plenodomas Meliloti Dearn. & Sanford

For injury caused by brown root rot on common clover see under sweet clover.

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

Slight damage due to this disease was reported from Aberdeen and Saskatoon, Sask.

A light scattered infection was also observed at Becketts Landing, Ont.

MOSAIC - Virus

Mosaic caused a slight amount of damage at Summerland, B.C. Two clumps of sweet clover on the roadside near Ottawa, were infected with mosaic, while Medicago lupulina growing near by was free. This disease was also reported from Becketts Landing, Ontario.

BROWN ROOT ROT - Plenodomas Meliloti Dearn. & Sanford

Alta.-

Brown root rot was not as destructive this year as in 1929, although this disease was fairly common and in places severe. It was found also on common clover and alfalfa.

Sask.-

An infected plant was found on the roadside near Saskatoon.

SCLEROTINIA ROOT ROT - Sclerotinia Trifoliorum Erikss.

This root rot was reported from the lower Fraser valley, B.C. Damage was slight.

The indications are that losses from Sclerotinia may be greater than commonly realized in Alberta. Infection of the soil is common and widespread. (Sanford)

CORN

SMUT - Ustilago Zeae (Beck.) Ung.

Alta.-

A slight infection was reported from Brooks, where the disease had been observed in 1928 and 1929.

Sask.-

This disease is not often troublesome in Sask. It was reported on garden corn at Indian Head and Whitewood.

Man.-

Smut was reported in 4 fields; in zone 3 one field had 50 per cent of the hills infected and a second with 10 per cent of the ears smutted; in zone 1, only a trace was present in 2 fields.

Ont.-

Only a slight infection was observed in Lincoln county.

N.B.-

Two per cent of the plants at the Experimental Farm, Fredericton, were infected. The disease occurred widely throughout the province, but it caused only slight damage.

RUST - Puccinia Sorghi Schw.

Corn rust was quite general in the Red River valley, Man. Infections, however, were too light to cause any appreciable damage.

Very small localized infections were observed at the Experimental Farm, Charlottetown, P.E.I.

BLIGHT - Fusarium sp.

This disease seems to result in poorly developed ears in P.E.I.

FLAX

WILT - Fusarium Lini Bolley

Alta.-

Wilt was not observed on flax this year.

Sask.-

Of 3 fields examined all were affected with wilt, two lightly and one moderately. This disease was also reported from Dollard and Yellow Grass.

Man.-

Out of several fields examined, two were found to be badly infected with wilt, the damage amounting to 25 per cent.

N.B.-

Only three affected plants were observed in York county.

RUST - Melampsora Lini (Pers.) Desm.

Only one field out of 21 examined in Sask. showed any

infection and in this one the damage was negligible.

A trace of rust was also observed in four fields in Manitoba.

HEAT CANKER - Non-parasitic

This disease caused severe damage in the University plots, Edmonton, Alberta.

At the Experimental Farm, Ottawa, Ont., up to 50 per cent of the plants of several varieties were destroyed by heat canker.

From the University of Saskatchewan, Saskatoon, T. C. Vanterpool reported a root rot of flax, from which Fusarium, Rhizoctonia and Alternaria were isolated.

SUNFLOWER

WILT - Sclerotinia Sclerotiorum (Lib.) de Bary

B.C.-

General on Vancouver island and in the lower Fraser valley. When rotation is not practised the damage is severe.

Sask.-

Sunflower wilt was reported from Saskatoon and Alameda. At the latter place 15 per cent of the plants were dead.

Man.-

Wilt was apparently quite common in Manitoba this year. Many fields in zone 1 were badly damaged. In one field the areas were large, where all the plants were destroyed. In another field 30 per cent of the plants were killed.

N.B.-

Only two specimens of wilt were observed in a field near the Experimental Station, Fredericton.

N.S.-

In a varietial test of 450 pure lines at Kentville, infection varied from 0 - 70 per cent. In one case the head was infected, in all others the infections were of the crown or stem type.

RUST - Puccinia Helianthi Schw.

Sask.-

Traces of the aecial stage were found on cultivated sunflower at Saskatoon and Indian Head while a trace of the uredenial stage was present in August at Indian Head.

Sunflower

Man.-

This rust was common throughout Manitoba and was quite severe in some fields.

N.S.-

In a varietial test at Kentville, varying amounts of rust were present on a large number of pure lines. Some showed as much as 50 per cent of the foliage affected. A few lines showed appreciable resistance.

LEAF SPOT - Septoria Helianthi Ell. & Kellerm.

The majority of the pure lines under test for wilt resistance at Kentville were susceptible to leaf spot, but only a few lines were injured.

CULTIVATED GRASSES

Awnless Brome (Bromus inermis)

Leaf spot (Septoria bromigena Sacc.) Light to heavy infections were present in most fields inspected in Saskatchewan. The damage was slight.

Scald (Rhynchosporium Secalis (Oud.) Davis) was general in the Clive district (zone 10), Alta.

Ergot (Claviceps purpurea (Fr.) Tul.) was found occasionally on Vancouver island and in the lower Fraser valley, B.C.

It was reported from Edmonton, Alta.

Ergot was found at Saskatoon, Sask. and in the south eastern part of the province it has been frequently noticed along the roadsides and spreading into adjoining fields of rye.

Smut (Ustilago bromivora Tul.) Common on Vancouver island B.C.

Timothy (Phleum pratense)

Rust - (Puccinia graminis Pers. var. Phlei-pratensis (Erikss. & Henn.) Stakm. & Piemeisel) caused severe damage in some sections of B.C.

Common, but slight infections were reported from Alta.

Slight and scattered rust infections were observed in Colchester, Antigonish, and Digby counties N.S.

Rust appeared late in the season in P.E.I. Only scattered infections were observed.

Smut - (Ustilago striaeformis (Westend.) Niessl) A trace of timothy smut was observed along the edge of a field, Manotick, Ont.

Ergot - (Claviceps purpurea (Fr.) Tul. was occasionally found on Vancouver island, B.C.

Reported also from Edmonton, Alberta.

Western Rye Grass - (Agropyron tenerum)

Smut (Ustilago bromivora (Tul.) Fisch.) caused medium damage at Lloydminster, Alberta.

Moderate damage from smut was reported in one field near Venn, which had 10 per cent of the plants infected, and also in a plot at the University Farm, Saskatoon, Sask., showing 25 per cent of the plants smutted.

Rust - (Puccinia Clematidis (DC.) Lagerh.) caused very slight damage at Quill Lake, Sask.

Ergot - (Claviceps purpurea (Fr.) Tul. was observed at Edmonton, Alberta.

Sudan Grass (Holcus Sorghum sudanensis)

Bacterial? Leaf spot (Bacillus Sorghi Burr.) was observed on the Experimental Farm at Saskatoon and Indian Head, Sask. In some cases the infections were heavy, but the damage was light.

Broom Millet (Panicum miliaceum)

Smut (Sorosporium Panici-miliacei (Pers.) Takah.) A slight infection was observed in Alberta.

In a small plot at the Experimental Farm, Indian Head, Sask. 5 per cent of the heads were affected.

Fescue (Festuca spp)

Rust (Puccinia graminis Pers.) was quite common on Vancouver island, although the damage was slight.

MISCELLANEOUS CROPS

Buckwheat

A heavy and general mottling of the leaves, possibly due to a virus, was observed at Kentville Agricultural School, Ont. The affected plants appeared vigorous.

Vetch

A bacterial blight was common and apparently destructive on pearl vetch at the Experimental plots, Olds, Alberta.

DISEASES OF VEGETABLE AND FIELD CROPS

ASPARAGUS

RUST - Puccinia Asparagi DC.

Sask.-
A heavy infection occurred on rows in a sheltered spot in the University garden, Saskatoon, while the main asparagus bed appeared to be free from rust.

Man.-
Some heavily infected plants were collected at Newdale.

Ont.-
A medium infection of rust was reported from Lincoln county.

N.B.-
Only one plant was found infected at the Experimental Station, Fredericton.

BEAN

MOSAIC - Virus

B.C.-
Ten to twenty-five per cent of the plants were affected in the Okanagan valley and the lower mainland.

Alta.-
Mosaic was found in 5 fields out of 20 examined. The heaviest infection observed was at the Experimental Station, Lethbridge. Mosaic in a severe form is fairly common.

Sask.-
Five to ten per cent of the plants were affected in a garden at Saskatoon; the damage was slight. The plants were stunted, late and podless.

N.B.-
Ten per cent of the plants were affected with mosaic in a plot of several varieties, Experimental Station, Fredericton.

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

Alta.-
Anthracnose caused only slight damage at Edmonton.

Bean

Que.-

The disease was first observed on June 20; ordinarily it does not appear till later. Only a trace was present at that time in Jacques Cartier and Rouville counties. The estimated average infection was 10 to 25 per cent in 3 fields examined in the Quebec district at a later date.

N.B.-

Anthracnose was widespread but of slight importance in 1930. A moderate infection was reported from the Experimental Station at Fredericton.

N.S.-

Anthracnose caused an average damage of 5 per cent in Kings county. The disease spread slowly this year.

P.E.I.-

All varieties are attacked by this disease, some more severely than others. It is usually severe in small gardens.

BACTERIAL BLIGHT - Pseudomonas Phasecli E.F.Sm.

Alta.-

This is a very common disease in Alberta, being observed in 26 out of 30 fields examined in 1930. The estimated average damage was 6.6 per cent, although at Olds the crop was a total loss.

Sask.-

Bacterial blight was present in field beans to a very slight extent in the Indian Head district in 1930, but many varieties of garden beans at the Experimental Farm were severely infected and in some cases completely defoliated.

Man.-

In one field near Charleswood, 100 per cent of the plants were infected. No other cases were reported.

N.B.-

A slight infection was reported from the Experimental Farm at Fredericton.

N.S.-

A large number of varieties of beans were infected in Kings county; the estimated damage was 15 per cent.

P.E.I.-

Only one slight infection was observed in Queens county.

MISCELLANEOUS DISEASES

STEM ROT - Rhizoctonia spp.
Stem rot was common and frequently severe in Alberta.

WILT - Sclerotinia Sclerotiorum (Lib.) de Bary
This disease was widespread and caused considerable damage throughout N.B. A severe infection was observed at the Experimental Station and in two gardens in Fredericton.

WILT - Botrytis cinerea Pers.
Although this wilt was destructive in the St. John valley, N.B. in 1928 and 1929, when the loss was estimated to be 15 per cent of the crop, it was of slight importance this year.

RUST - Uromyces appendiculatus (Pers.) Lév.
Sixty per cent of the foliage was rusted in White Pole beans, in Kings county, N.S. The rust was late in appearing and little developed on other varieties. This disease was not as severe in P.E.I. as it has been in wetter seasons.

ROOT ROT - Pythium spp.
A trace of root rot was found in a low lying spot in a plot of peas, Saskatoon, Sask. The species of Pythium responsible has not yet been determined (T. C. Vanterpool).

BROAD BEAN

STEM ROT - Cause unknown
About one half of one row of broad beans in the University garden, Saskatoon, was killed by an unknown disease. The stems turned black at the base and rotted off.

BEET

ROOT ROT - Rhizoctonia Solani Kühn.
One specimen was sent to the Laboratory at Fredericton N.B. for identification.

LEAF SPOT - Phoma Betae (Oud.) Frank
This disease was general on Vancouver island and the lower Fraser valley, B.C. The damage from seedling wilt was considerable.

Several varieties were severely infected at the Experimental Station, Fredericton, N.B.

SCAB - Actinomyces scabies (Thaxt.) Güssow
Scab was observed in Alberta. A slight infection was also observed in a small garden in P.E.I.

CABBAGE

CLUB ROOT - Plasmodiophora Brassicae Woron.

B.C.-

In over half the fields in the Armstrong district, 50 to 80 per cent of the plants were affected with club root. The disease was also severe in one garden in Victoria.

N.B.-

Three per cent of the plants were severely infected in the Experimental plots, Fredericton.

P.E.I.-

One per cent of the plants were destroyed in a small garden in Queens district. The disease was not important this year.

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

Fifteen per cent of the plants in a field containing 500 plants were destroyed in Nicolet county, Que.

CANTALOUPE

BREAKDOWN - Non-parasitic

This disease causes some trouble in the Oliver district, B.C.

SCLEROTINIA ROT - Sclerotinia Sclerotiorum (Lib.) de Bary

Seventy-five per cent of the fruit kept in a storage house at the Experimental Station, Fredericton, N.B. were infected on Sept. 25.

CARROT

SCLEROTINIA ROT - Sclerotinia Sclerotiorum (Lib.) de Bary

Fifty per cent of the locally grown carrots in storage were destroyed by this rot in the Edmonton district.

A few specimens were found in a storage house in York county, N.B.

CAULIFLOWER

CLUB ROOT - Plasmodiophora Brassicae Woron.

Fifteen to 20 per cent of the plants of Stoke's Erfaurt were severely diseased in Lincoln county, Ontario. A second variety growing along side was not attacked. The soil was gravelly and light. Two per cent of the plants were slightly affected in the Experimental plots, Fredericton, N.B.

Cauliflower

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

A heavy infection, causing a loss of 75 per cent, was observed in Nicolet county, Que.

CELERY

LATE BLIGHT - Septoria Apii Chester

Man.-
All the plants in a field just north of Winnipeg were severely infected.

Ont.-
A light infection was observed in Lincoln county; the damage was negligible.

Que.-
A moderate to severe infection in Nicolet county caused a loss of 25 per cent of the crop.

N.B.-
A moderate infection was reported from the Experimental Station, Fredericton. This disease is quite general in the St. John valley.

P.E.I.-
Losses were very heavy on all varieties. The plants were sprayed but infrequently with Bordeaux, which may account for the lack of control.

YELLOWS - Fusarium spp.

Celery was slightly damaged by yellows at Armstrong, B.C.

HEART ROT - Non-parasitic

Seventy-five per cent of the celery was affected with heart rot and rendered unfit for market in Wentworth county, Ontario.

SOFT ROT - Bacillus carotovorus L.R. Jones

Several gardens were badly infected in the vicinity of Victoria, B.C.

CUCUMBER

FRUIT SPOT (SCAB) - Cladosporium cucumerinum Ell.& Arth.

Que.-
A loss of 10 per cent of the crop was reported at Nicolet

Cucumber

county. About 50 per cent of the leaves were infected.

N.B.-

Heavy infections were reported from York, Sunbury, and Kings counties. This disease was widespread and is probably the limiting factor in the growing of cucumbers.

BACTERIAL WILT - Bacillus tracheiphilus E.F.Sm.

A scattered infection was reported in 2 greenhouses in southern Ontario. In the one at Kingsville, the disease probably became severe.

MOSAIC - Virus

Only two specimens were found at the Experimental Station, Fredericton, N.B.

Although this disease occurs regularly every year on all varieties in P.E.I. only rarely has any severe injury been observed.

EGG PLANT

PHOMOPSIS BLIGHT - Phomopsis vexans (Sacc. & Syd.) Harter

This disease took the form of a wilt of 1 to 2 per cent of the plants in the Okanagan district, B.C.

WILT - Verticillium sp.

Fifty per cent of the plants were affected with wilt in a field in Lincoln county, Ontario. The disease caused a reduction in the size and number of fruits.

JERUSALEM ARTICHOKE

WILT - Sclerotinia Sclerotiorum (Lib.) de Bary

A trace of wilt was observed in the Experimental Station garden, Fredericton, N.B.

LETTUCE

DROP - Sclerotinia Sclerotiorum (Lib.) de Bary

In one field near Winnipeg, Man. about 5 per cent of the heads were damaged. A slight infection was also reported from N.B., where the disease is widespread but caused only slight damage.

GRAY MOULD - Botrytis cinerea Pers.

Gray mould was general on Vancouver island, B.C.

TIPBURN - Non-parasitic

Slight damage from tipburn was reported from the Okanagan district, B.C.

ONION

NECK ROT - Botrytis Allii Munn

Five per cent of the crop of Yellow Globe and Danvers was destroyed in the Okanagan valley, B.C. This represents a loss of 500 tons of onions valued at $10,000.

Neck rot is an important disease in P.E.I. Heavy losses occur in Yellow Globe, Danvers, Large Red Weathersfield and Red Globe.

BULB ROT - Fusarium sp.

About 5 per cent of the crop was lost in the Kelowna district, B.C.

PEA

POWDERY MILDEW - Erysiphe Polygoni DC.

Alta.-

This disease is common late in the season.

N.B.-

A slight infection was reported from the Experimental Station, Fredericton. The disease was general but of no importance.

P.E.I.-

Heavy infection and severe injury was observed in the following varieties; American Wonder, Thomas Laxton and Sutton Excelsior.

ROOT ROT - Fusarium spp.

Root rot is a common and important disease of peas in Alberta.

Scattered infections were observed in many of the canning areas of Ontario. Harsford Laxtonian, Thomas Laxton, Alaska and Rogers Winner are susceptible while Green Admiral, Yellow Admiral and Haral are resistant (R. E. Stone).

LEAF and POD SPOT - Ascochyta Pisi Lib.

Alta.-

The losses in Alberta due to this disease are not serious.

Pea

Sask.-
A trace was found on the pods this year at Saskatoon. Two years ago the disease was heavy in the same place, but the last two seasons have been dry.

N.B.-
A moderate infection was reported from the Experimental Station at Fredericton. This disease is an important limiting factor in the production of this crop.

LEAF BLOTCH - Septoria Pisi West.

Leaf blotch was common in Alberta although no damage was evident.

Slight damage was observed on both field and garden peas at Indian Head, Saskatchewan.

MISCELLANEOUS DISEASES

BLOSSOM BLIGHT - Alternaria spp.
Fifteen per cent of the blossoms were blighted in a field in Lincoln county, Ontario.

ROOT ROT - Pythium sp.
A trace of root rot was observed at Saskatoon, Sask. The disease was confined to a low spot in the field. The species of Pythium responsible has not yet been determined.

RUST - Uromyces Fabae (Pers.) de Bary
A moderate infection was reported in the Experimental Station garden, Fredericton, N.B.

MOSAIC - Virus
One per cent of the plants were affected in a field in Kings county, N.S.

DOWNY MILDEW - Peronospora Viciae (Berk.) de Bary
Five per cent of the plants were affected in several varieties of canning peas growing in the Fraser valley, B. C. The damage was negligible.

PEPPER

BLOSSOM END ROT - Non-parasitic
Fifteen per cent of the crop was affected at Morden Man. Alternaria was found on many of the diseased spots.

Pepper

Ten to 15 per cent of the fruit were affected by blossom end rot in a field in Lincoln county. Diseased fruit were useless.

POTATO

Before considering the different diseases by provinces, a few facts are presented on certain diseases as they affect Canada as a whole. These data were obtained from summaries prepared from observations made by the Potato Inspectors during their examination of fields of potatoes grown from certified seed. Out of 9707 fields, which were planted with certified seed and inspected, 2411 fields or 24.8 per cent were rejected on account of disease or other causes. On an acreage basis 19 per cent failed to pass inspection. Of the fields rejected on account of disease mosaic was responsible for 53 per cent of the rejections. Black leg was second with 9.4 per cent and leaf roll third with 5.6 per cent. In addition 11.6 per cent were rejected on account of being adjacent to diseased fields.

The above diseases were not equally prevalent in every province. Mosaic was most prevalent in N.B., N.S., Alta,, P.E.I., and B.C., infection in the rejected fields varying from 5.8 per cent to 2.9 per cent respectively. Leaf roll was most destructive in N.S. and Alta., while black leg was most prevalent in Sask. and Man.

LATE BLIGHT - Phytophthora infestans (Mont.) de Bary

Que.-

In a half acre field of Green Mountains, one per cent of the tubers were left in the field on account of tuber rot.

N.B.-

Late blight was most prevalent in Victoria and Sunbury counties although, some injury occurred in almost every county. In general the infection was slight to moderate.

N.S.-

Only a small amount of tuber rot was observed in Colchester county. One lot of Garnet Chili, where the crop had not been sprayed showed 2 per cent, and 2 lots of Irish Cobblers, 1 and 3.5 per cent respectively. Twenty other lots of each variety were practically free.

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

Man.-

Rhizoctonia was quite common in Manitoba. However, only a trace was present in most fields examined. In a field at Virden,

Potato

25 per cent of the plants were affected.

N.B.-

Rhizoctonia was present on all varieties. In general the infections were slight, except in Madawaska and Victoria counties, where 25 per cent of the fields were moderately infected. Tuber infection was correspondingly higher in these counties than the rest of the province.

N.S.-

Rhizoctonia was reported on Irish Cobbler tubers from Pictou, Colchester and Halifax counties. Usually the percentage of tubers infected averaged from 6 to 8 per cent. In four lots, however, infection varied from 10 to 30 per cent.

COMMON SCAB - Actinomyces scabies (Thaxt.) Güssow

Sask.-

Scab was prevalent this year on account of the drought.

N.B.-

Moderate infections were reported on all varieties from every county.

N.S.-

It was estimated that 4.3 per cent of the tubers were affected with scab in 30 lots of potatoes examined in Colchester and Pictou counties. The highest infection recorded was 15 per cent.

BLACK LEG - Bacillus phytophthorus Appel

Sask.-

In the field inspection of certified seed potatoes, 3 fields were rejected in eastern Sask. on account of black leg. The average infection in these fields was 9.2 per cent. Only a trace was present in the fields that passed.

Man.-

Thirty per cent of the plants were infected in a field at Virden, Man. Six fields were rejected on account of black leg in the field inspection of certified seed potatoes. The average infection in these fields was 8.9 per cent, while it was 0.3 per cent in the fields that passed.

N.B.-

Black leg was most prevalent in Carleton, Restigouche and Westmoreland counties, where 2 per cent or more of the plants were diseased in some of the fields.

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

Alta.-

Early blight caused slight damage in a garden at Edmonton.

N.B.-

The disease was most prevalent on the foliage in Sunbury county, where it was also severe in 5 per cent of the fields. Over 50 per cent of the fields were slightly to moderately infected, in Restigouche and York counties.

P.E.I.-

Thirty-five per cent of the tubers were seriously affected with rot due to Alternaria Solani in a bin of Irish Cobblers in Queens county.

LEAF ROLL - Virus

Alta.-

Leaf roll caused slight damage at Brant.

N.B.-

Traces of leaf roll were reported from every county. Two per cent or more of the plants were infected in several fields in Northumberland, Carleton, Gloucester and Westmoreland counties.

MOSAIC - Virus

Sask.-

Only a trace of mosaic was observed in the 55 fields of certified seed potatoes examined.

Man.-

Out of 95 fields inspected, one was rejected for mosaic in the field inspection of certified seed potatoes.

N.B.-

Mosaic was prevalent in every county. It was most severe in Charlotte, York and Sunbury counties where of the fields inspected, 87.5, 26.0 and 36.8 per cent respectively contained 2 or more per cent of mosaic.

DRY ROT - Fusarium spp.

N.B.-

Dry rot is widespread in storage houses. Inspection of the tubers in April showed that 20 per cent were moderately affected.

Potato

P.E.I.-

Dry rot was fairly prevalent this autumn in P.E.I. Inspections made in November showed 1 per cent of the tubers affected.

MISCELLANEOUS DISEASES

SKIN SPOT - Oospora pustulans Owen & Wakefield

A trace of skin spot was found at the Experimental Station, Fredericton, N.B.

POTASH HUNGER - Non-parasitic

Potash hunger was observed in a small field of Green Mountains in York county, N.B.

TIPBURN - Non-parasitic

This disease was not severe in N.B. in 1930. Three per cent of the plants were moderately affected.

VERTICILLIUM WILT - Verticillium albo-atrum Reinke & Berth.

A single specimen was collected in York county, N.B.

CURLY DWARF - Virus

A trace was observed at the Experimental Station, Fredericton, N.B.

STREAK - Virus

One plant of Spaulding Rose was found infected at the Experimental Station, Fredericton, N.B.

SILVER SCURF - Spondylocladium atrovirens Harz.

An examination of the potatoes in storage at the Experimental Station, Fredericton, N.B. on April 3, showed that 65 per cent were affected. The disease is widespread and quite important in N.B. as it disfigures the tubers sufficiently to lower their market value.

In P.E.I. two per cent of the Irish Cobblers examined in November were affected. However, this disease develops mostly in the early spring after potatoes have been in storage for some time and usually causes considerable damage.

POWDERY SCAB - Spongospora subterranea (Wallr.) Lagerh.

From observations made on 90 farms in York county, N.B. it was estimated that the average infection was only a trace.

NET NECROSIS - Cause undetermined

A trace of net necrosis was found in Green Mountains at the Experimental Station, Fredericton, in April.

SPINDLING TUBER - Virus

Slight amounts of spindling tuber were found in several counties in N.B.

PHOMA ROT - Phoma tuberosa Melhus, Rosebaum & Schultz

Two per cent of the Irish Cobblers examined in November in P.E.I. were affected with dry rot following powdery scab. An appreciable loss occurs each year in storage from Phoma rot.

RHUBARB

CROWN ROT - Cause undetermined

Crown rot is common and severe in Alberta. In Sask., where this disease is widespread and very destructive, up to 50 per cent damage was reported.

LEAF SPOT - Ascochyta Rhei Ell. & Ev.

In Saskatoon, Sask., the spotting was more severe on the petioles, where they had been injured by hail. Nature pycnidia were collected.

Slight damage from leaf spot was reported from Queens county, P.E.I.

STEM ROT - Botrytis spp.

Stem rot was severe in two places in Alberta.

ANTHRACNOSE - Colletotrichum erumpens Sacc.

Anthracnose was found at the Experimental Station, Morden, Man. Hills here and there in the field were completely destroyed.

LEAF SPOT - Phyllosticta straminella Bres.

A moderate infection was reported from the Experimental Station, Fredericton, N.B. This disease is general but not serious.

RUTABAGA

CLUB ROOT - Plasmodiophora Brassicae Woron.

Twenty-five per cent of the plants were moderately affected with club root in York county. The disease is widespread and serious in many sections

WATER CORE OR BROWN HEART - Non-parasitic

B.C.-

This disease occurred in a small patch of about one and one half acres, containing 3 varieties at Kelowna. Ten to 75 per cent of the crop was injured depending on the variety.

N.B.-

What appears to be the same disease was very destructive in both 1929 and 1930 in York county. All varieties are affected.

SPINACH

DOWNY MILDEW - Peronospora effusa (Grev.) Rabh.

This disease was observed in two gardens in Saskatoon, Sask., where it caused slight damage.

Spinach was moderately infected in a patch that had been watered frequently at Kentville, N.S. Generally the disease was absent in Kings county.

BACTERIAL SOFT ROT - Bacillus ?carotovorus L.R. Jones

Two per cent of the plants were destroyed in a garden at Edmonton, Alberta.

TOBACCO

BLACK ROOT ROT - Thielavia basicola Zopp

Ont.-

Due to the hot, dry, season, losses from black root rot in Ont., were very small.

Que.-

This disease still causes considerable loss in Quebec as many farmers fail to treat their seed-bed soil. The disease may be found to some extent in at least 25 per cent of the tobacco fields.

DAMPING OFF - Pythium de Baryanum Hesse

Ont.-

In Essex and Kent counties, damping off was quite prevalent, A few cases of "sore-shin" were traced to damping off in the seed-bed.

Que.-

The usual amount of infection was reported from Quebec.

SEED-BED MOULD - Pyronema confluens (Pers.) Tul.

This saprophytic mould necessitated the reseeding of a number of seed-beds, which are semi-hot beds covered with glass, at the Experimental Station, Harrow, Ont. The disease was first noted in 1928.

HOLLOW STALK - Bacillus carotovorus L.R. Jones

A few plants affected by this disease were observed in Quebec.

WILDFIRE - Pseudomonas Tabacum (Wolfe & Foster) Stev.

This disease has not spread beyond the Yamaska valley, Que. Through the co-operation of the growers, the disease was present in only one field this year and the grower in this instance had not carried out the sanitation programme recommended.

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

The disease was observed only a few times; the localities were not stated.

MOSAIC - Virus

B.C.-

A marked increase was observed in the Sumas area. The damage was significant, but the disease was not general in the lower Fraser valley.

Ont.-

In Ontario mosaic was not as prevalent as it has been in the past.

Que.-

In the northern district of Que., this trouble is rather more prevalent this year, while in the Yamaska valley it is rather less abundant.

MISCELLANEOUS DISEASES

FRENCHING (non-parasitic) was reported from eastern Ontario and in the Okanagan valley, B.C.

CURLY DWARF (non-parasitic) was observed in the Okanagan valley, B.C.

LEAF DROP (non-parasitic). Seventy-five per cent of the leaves were affected in two fields near Kelowna, B.C.

SAND DROWN (magneium deficiency) occurred to some extent on the lighter soils in Quebec.

BROWN ROOT ROT (Cause unknown) was found to a slight extent in Essex county, Ontario.

DROUGHT INJURY - The extended drought in south western Ontario resulted in an abnormal yellowing of the Burley, and a burning of the flue-cured tobacco. Rain early in September stimulated

the tobacco to grow a second time. In consequence, maturity was delayed and curing was difficult, resulting in a high percentage of dark leaf and considerable rim-burn.

SHED BURN - The wet weather that occurred about the middle of September caused some damage in eastern Ontario and Quebec.

TOMATO

BLOSSOM-END ROT - Non-parasitic

B.C.-

Blossom-end rot was general all over the province and was reported as severe at the Experimental Farm, Saanichton.

Sask.-

This disease was common around Wolseley. One garden had from 60 to 75 per cent of the fruit affected.

Man.-

In the plots at the Experimental Station, Morden, 5 to 10 per cent of the plants were affected.

Ont.-

Severe damage was reported from Lincoln, Leeds, Ontario, and Halton counties. The disease was very general and severe this year due to the prolonged drought.

N.B.-

This disease was widespread in greenhouses causing considerable damage. A moderate infection was reported from the Experimental Station greenhouse at Fredericton.

N.S.-

Two to five per cent of the crop was affected in Kings county. The disease was found generally on light soil and was probably more prevalent on account of the dry weather.

P.E.I.-

A complete loss of a crop of tomatoes was observed in a commercial garden at Charlottetown. The soil was exceedingly rich and the weather was alternately wet and dry.

MOSAIC - Virus

B.C.-

Slight damage occurred in both fields and greenhouses in the Okanagan valley, B.C.

Ont.-

Infections of 25 to 35 per cent on Ignotum and 50 per cent on Early Evans were observed in Lincoln county. John Bean and Chalks Jewel growing alongside infected Early Evans, were resistant. In general, tomato mosaic was very prevalent in Lincoln county, this year.

Que.-

Seventy-five to 80 per cent of the plants were affected with with mosaic in 3 large greenhouses at Côte des Neiges, Montreal. The owners claim to have lost 50 per cent of their previous crops due to mosaic and streak.

N.B.-

This disease is widespread and is an important limiting factor in tomato production. A moderate infection was observed in the Experimental Station garden at Fredericton.

STREAK - Virus

Ont.-

Fifty per cent of the plants were seriously stunted from streak and mosaic in a greenhouse in Welland county. Isolated cases of streak were also observed in the field on plants heavily infected with mosaic in Lincoln county. Potatoes growing in the immediate vicinity may have been responsible for the streaking of the mosaic infected plants.

Que.-

In a greenhouse at Côte des Neiges, Montreal a trace of streak was observed. The owners claim that the damage is worst at the 5th fruit spur stage and that in previous crops they have lost as high as 50 per cent of their crop. (See report under Mosaic.)

N.B.-

Only one specimen of streak was observed in the Experimental Station garden at Fredericton.

LEAF MOULD - Cladosporium fulvum Cke.

B.C.-

Five per cent of the crop was lost from leaf mould in a greenhouse at Summerland, B. C.

Ont.-

A very severe infection caused defoliation and reduction of vigor in a greenhouse crop in Lincoln county.

Tomato

Que.-
A few spots were reported on the lower leaves of greenhouse tomatoes at Côte des Neiges, Montreal.

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

Que.-
A late infection developed on all the leaves, but caused little damage in a field at Aylmer.

N.B.-
This disease is widespread, and where no spray was applied it was severe.

P.E.I.-
In a small garden, severe damage was reported due to the drying up of the leaves.

LEAF SPOT - Septoria Lycopersici Speg.

This disease was general in the greenhouses on Vancouver island. A light infection was also reported from P.E.I.

VERTICILLIUM WILT - Verticillium ovatum Berkeley & Jackson

One per cent of the plants were affected with wilt in Lincoln county, Ontario.

BREAKDOWN - Non-parasitic

This disease is found occasionally on some of the fruit in the Okanagan valley, B.C.

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

All varieties were affected, infection varying from 0 to 90 per cent in Kamloops and the Okanagan valley, B.C.

WILT - Fusarium Lycopersici Sacc.

Wilt was general but caused only slight damage in the greenhouses on Vancouver island, B.C.

ROOT KNOT - Heterodera radicicola (Greef) Muell.

Root knot is general in the greenhouses on Vancouver island, B.C.

WESTERN YELLOW BLIGHT

This disease was general in the greenhouses on Vancouver island, B.C.

TURNIP

CLUB ROOT - Plasmodiophora Brassicae Woron.

Que.-
In one field in Isle Verte county, 10 to 15 per cent of the plants were diseased.

N.B.-
Two per cent of the plants were severely affected with club root at the Experimental Station, Fredericton.

N.S.-
Infections were very patchy in Colchester county. Out of 14 fields examined, 11 were found to be free from infection. In the affected fields the infections were 25, 50 and almost 100 per cent respectively.

POWDERY MILDEW - Erysiphe Polygoni DC.

A moderate infection of powdery mildew was reported in Queens county, P.E.I.

DRY ROT - Phoma Lingam (Tode) Desm.

This rot is present in all turnip fields in P.E.I. causing slight to heavy damage. Fields have been observed that were unfit to harvest on account of the rot.

BROWN HEART - Non-parasitic

Brown heart occurs generally throughout P.E.I. The loss due to this disease in 1930 was estimated to be $50,000.

WHITE SPOT - Cercosporella albo-maculans (Ell. & Ev.) Sacc.

Ten per cent of the plants were slightly affected in York county, N.B. The disease was not important this season in comparison with 1929 when 80 per cent of the plants were severely infected.

Turnip

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

Sixty per cent of the plants were severely infected in the Experimental Station plots, Fredericton, N.B.

MACROSPORIUM SPOT - Alternaria herculea (Ell. & Mart.) J.A. Elliott

This leaf spot was severe on the Experimental Station plots, Fredericton, N.B.

DISEASES OF FRUIT CROPS

APPLE

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

B.C.-

Scab was particularly severe in the Kootenay district this year. In three orchards the percentages of fruit infected by actual count were as follows: Fameuse 18 per cent, Winter Banana 40, and McIntosh 48. The Fameuse and Winter Banana trees were sprayed four times while in the McIntosh orchard the trees were sprayed five times, the first spray being based on ascospore maturity. In Vancouver island, however, the damage was not as severe as in 1929 although the losses were large. In the northern part of the Okanagan valley only one half of one per cent of the fruit were scabbed.

Man.-

Scab was reported from one locality only, near Winnipeg. Seventy-five per cent of the leaves on some trees were infected. The fruit was also scabbed.

Ont.-

Scab was slightly more prevalent than in 1929 in the Niagara peninsula although hot, dry weather checked the spread of the disease. Unsprayed orchards were severely damaged. Ascospore discharge did not take place until May 1, when it was general and well marked. The dry weather of the previous two weeks had prevented early discharge although the asci were mature.

Que.-

Severe infection of Fameuse was reported in an unsprayed orchard in Jacques Cartier county. From observations made at the Experimental Farm and the School of Agriculture, Ste. Anne de la Pocatière, the infection on the different varieties was estimated as follows: Alexander, Gano, Golden Russett and Milwaukee 5 per cent; Duchess, Greening and Melba 10 per cent; Transparent and Wealthy 15 per cent; St. Lawrence 20 per cent; Wolf River 25 per cent; Baxter and Fameuse 30 per cent; and McIntosh 65 per cent. In two orchards in Rouville and Iberville counties and in the orchard at the Experimental Farm, Lennoxville, where careful spraying has been practiced, only infections varying from a trace to slight developed on the leaves or fruit.

N.B.-

Scab was general although not as severe as in 1929. Approximately 400 trees in seven orchards, representing several varieties, showed an infection of 20 per cent. Pin point scab was observed in severe form in two orchards on Oct. 8.

N.S.-

First ascospore discharge occurred on May 15-16. The first

conidia appeared on the leaves on June 5. On June 20, well sprayed orchards showed less than one per cent of scab while unsprayed orchards showed 10 to 70 per cent. By Oct. in sprayed orchards, fruit infection varied from 0 to 20 per cent while in unsprayed orchards infection varied from 40 to 100 per cent. More scab was present in the western part of the Annapolis valley than the eastern.

P.E.I.-

This disease occurs annually in P.E.I. causing serious injury to the fruit. In all orchards with the exception of two, where careful spraying was practiced, apple scab was very destructive rendering otherwise splendid orchards useless.

FIRE BLIGHT - Bacillus amylovorus (Burr.) de Toni

B.C.-

Fire blight occurred on several varieties in the Okanagan valley, mostly, however, on Spitzenburg. One per cent of the trees of all varieties were infected. The disease was not positively identified on Vancouver island or the lower Fraser valley.

Man.-

In the orchard at the Man. Agricultural College, Winnipeg, 50 per cent of the trees were infected. The disease was also prevalent at Morden.

Ont.-

Fire blight was more prevalent this year than in 1929, particularly as a twig blight. In one orchard of crab apple trees fire blight progressed down the branches causing the death of large portions of the trees.

Que.-

Fire blight was severe in Quebec in 1930. It occurred in epidemic form in many orchards. It was particularly prevalent in four out of the eight apple growing districts of western Quebec, and it was reported from scattered localities throughout the province.

At. St. Hilaire, there was a trace of both twig and blossom blight, while it was slightly more prevalent at Rougemont. In the Frelighsburg district, where there are mostly only young orchards, a trace of twig infection was generally present. In a few cases where there was an old farm orchard near the young trees, it was more severe. On Montreal island it was severe in one orchard on crab apple trees, and moderate on Fameuse, while a trace occurred on most of the other varieties. In general, it was present, mostly as twig blight, in all orchards.

Abbotsford was the most severely affected district, and the disease was mostly in the form of blossom blight. Counts in one

orchard showed 98 per cent blossom blight on Winter Arabka, 70 per cent on Wealthy, 40 per cent on Fameuse, 15 per cent on Russet, and a trace on Duchess and Yellow Transparent.

Fire blight was present in every orchard in this district, varying from a trace to severe. In one group of six Alexanders, there were 2 per cent of blossom blight and a trace of twig blight on June 26. On August 13, twig blight had become severe. In a block of Fameuse near these Alexanders there were 15-20 per cent blossom blight and a trace of twig infection, while in another block of Fameuse farther away there was only a trace of twig blight. Queen's Choice crabs, Flemish Beauty pears and one tree of Clapp's Favorite pears showed no blight on June 26, while on August 13, the crabs were severely affected with twig infection, the Flemish Beauty showed a trace, and the Clapp's Favorite pear tree was so severely affected that it subsequently died.

In the Hemmingford-Franklin district, blossom blight was general, but severe only in the vicinity of susceptible varieties of apple, such as Alexanders, or of pear. In one block of Alexanders about 30 years old there were 90 per cent blossom blight and a trace of twig infection.

Twig blight was general throughout the Chateauguay-Woodlands district, varying from moderate to severe, being severe in about 25 per cent of the orchards. Twig blight was also severe in a number of orchards at St. Joseph du Lac, but being of patchy occurrence on account of the orchards being isolated one from another. At Oka, the orchards are mostly those of the Oka Agricultural Institute, and on account of thorough pruning for blight control, only a trace occurred.

Specimens of twig blight of apple were sent in from Garthby, Wolfe county, and Mr. Perrault reported from 3 to 5 per cent blight in three orchards in Bellechasse county, and a trace in Kamouraska county. Late twig infection occurred on a few varieties of apple trees at Lennoxville (H.N. Racicot).

N.B.-

Only one tree, moderately infected, was observed in York county.

BLACK ROT - Physalospora Malorum Shear
(Sphaeropsis Malorum Berk.)

Sask.-

The greater part of one crab apple tree in the University orchard, Saskatoon, was killed by black rot, while slight infections occurred on several others.

Que.-

In one orchard, one per cent infection was reported on McIntosh in Kamouraska county.

Apple

N.B.-

Fifteen per cent of the trees at the Experimental Station, Fredericton, were severely affected with black rot.

PERENNIAL CANKER - Gleeosporium perennans Zeller & Childs

A careful survey of the Okanagan valley concluded on May 31, 1930, showed the following percentages of trees affected, whether the infection was light or severe: north Okanagan 6.8 per cent, central Okanagan 21.7 per cent and south Okanagan 0.14 per cent. The number of trees in each section is practically the same.

CORKY CORE - Non-parasitic

Corky core caused heavy losses in the Okanagan valley, B.C. Fruit from affected trees are unfit for shipment. The estimated loss of fruit and the percentage of trees affected were as follows: central Okanagan 100,000 boxes, 22 per cent of the trees, south Okanagan and Similkameen 25,000 boxes, 8 per cent of the trees.

RUST - Gymnosporangium spp.

Que.-

Rust on apples was reported from Kamouraska county.

N.S.-

Very little rust was reported on apples this year. The rust was identified as Gymnosporangium germinale (Schw.) Kern.

MISCELLANEOUS DISEASES

DIE BLACK and CANKER - Cytospora sp.

Cytospora, sometimes along with Physalospora, was plentiful on dead limbs at Saskatoon, Sask. It possibly followed winter or drought injury, as the summer and autumn of 1929 were exceedingly dry.

FROST and DROUGHT INJURY - Non-parasitic

The leaves of crab apple trees were severely injured in the University orchard, Saskatoon, Sask., the leaves dying and becoming discolored from the edges inwards. The effect on the trees this season was probably slight. The injury may have been due to frost or drought, as seven degrees of frost were registered on August 31, while, on the other hand, the trees are thickly planted and the past two seasons were both dry.

In Nova Scotia the injury from frost was most pronounced.

in low sections. The tips of the leaves were browned and some of the opening buds were injured. There were 4 to 9 degrees of frost on May 11, and 1 to 5 degrees on May 14.

DROUGHT SPOT and DIE-BACK - Non-parasitic

The average estimated damage from drought spot was 5 per cent in south Okanagan and Similkameen valleys, B.C., and 8 per cent in central Okanagan. In some districts within these areas as high as 20 per cent of the trees were affected.

The damage from die back was estimated to be 6 per cent in north Okanagan, 3 per cent in central Okanagan and 2 per cent in south Okanagan and Similkameen.

FROST RING - Non-parasitic

Late spring frosts caused much injury to the fruit principally of the Wealthy variety at Kamloops, B.C., it was estimated that 5 per cent of the fruit was damaged. Frost ring was equally heavy on Joanathan at Yale, B.C.

WINTER INJURY - Non-parasitic

Most of the young trees in all varieties were badly affected in B.C. by winter injury causing 7 per cent of the young trees to be damaged.

WATER CORE - Non-parasitic

One hundred per cent of the apples were affected with water core in the Trenton variety in the Experimental Farm orchard, St. Anne de la Pocatiere and 10 to 20 per cent in St. Lawrence in two orchards in l'Islet county.

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

Powdery mildew caused no commercial damage this year in B.C., nor has it been of any importance for the last two years. Periodically however, it causes a loss of as much as 100 per cent of the crop.

Very slight damage was caused to the tips of a few twigs in Lincoln county, Ontario.

BITTER PIT - Non-parasitic

Northern Spy is most subject to this disease in B.C., although other varieties may occasionally be found affected. A loss of 10 per cent of the crop was reported this year from the Okanagan valley.

Bitter pit losses were observed in N.S. in the following

varieties: Starks, 0 to 25 per cent, a total loss in some orchards there the crop was light; Greening and Blenheim, 0 to 5 per cent; and Baldwin, a trace.

ANTHRACNOSE - Neofabraea malicorticis (Cordley) Jackson

Anthracnose was confined in the Okanagan valley, B.C., to one district in the northern section, where one per cent of the trees were affected. The disease was general on Vancouver island and in the lower Fraser valley, where the damage is always severe unless control measures are practiced. It is probably the most important disease in apple orchards on the coast.

CROWN ROT - Non-parasitic

It was estimated that 2 per cent of the trees in all varieties were affected with crown rot in southern and central Okanagan districts, B.C. In some orchards as high as 75 per cent of the trees were injured.

TWIG BLIGHT - Nectria cinnabarina (Tode) Fr.

Twig blight was quite abundant in one orchard in N.S., following picking injuries of the previous year. It was most severe on Ben Davis and Rome Beauty.

EUROPEAN CANKER - Nectria galligena Bres.

From trees observed in two orchards in York county, N.B. The disease is widespread and quite serious in old orchards.

INTERNAL BREAKDOWN - Non-parasitic

This disease was found mostly in Jonathan and Grimes Golden varieties at Okanagan, B.C., causing about 5 per cent damage in the stored crop.

SOOTY BLOTCH - Gloeodes pomigena (Schw.) Colby

In unsprayed orchards in Kings county, N.S., 40 per cent of the fruit was affected, while in regularly sprayed orchards infections varied from a trace to 2 per cent. The damage was slight.

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

In Kings county, N.S. as much as 90 per cent of the fruit was affected with fly speck on unsprayed trees of the Wellington variety, while 0 to 5 per cent was marked on sprayed trees.

ARMILLARIA ROOT ROT - Armillaria mellea Fr.

A block of about 20 trees consisting of McIntosh, Delicious, Winesap and Winter Banana were attacked by Armillaria in a nursery at West Vancouver, B.C., but the trees were apparently not seriously injured. Armillaria is not common in B.C. and this is the first case of nursery infection recorded.

PINK ROT - Tricothecium roseum Link

Pink rot is an important disease in P.E.I., causing the decay of stored apples as the fruit are commonly affected with scab and are therefore susceptible to the rot.

CRINKLE CORK - Non-parasitic

Several specimens were found in one orchard in Kings county, N.S. It appears to be similar to Brooks and Fisher's "York Spot" or "Hollow Apple". This disease is apparently caused by drought.

APRICOT

DROUGHT SPOT

Drought spot caused a loss of 1.5 per cent of the crop in all varieties of apricot in the southern Okanagan valley, B.C.

BLACKBERRY

ORANGE RUST - Gymnoconia Peckiana (Howe) Trotter

B.C.-

Orange rust occurred locally on Vancouver island and the lower Fraser valley.

Ont.-

In a plantation in Lincoln county a trace of rust was found on May 27. The rust pustules were forming, but none were yet open.

N.B.-

A single specimen was sent to the Laboratory from Kings county.

N.S.-

Orange rust was very prevalent on wild blackberries, clumps having as many as 60 per cent of their shoots affected.

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

Cane blight was general on Vancouver island and in the lower Fraser valley. The damage, however, was insignificant.

BLUEBERRY

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

This disease was found on cultivated blueberries in Kings county, N.S.

CHERRY

SHOT HOLE - Coccomyces hiemalis Higgins
(Cylindrosporium hiemalis Higgins)

B.C.-
Shot hole occurs sporadically, causing much defoliation in the southern Okanagan section.

Ont.-
Shot hole was of no importance on cherries this year.

N.B.-
Only one specimen was obtained in York county.

N.S.-
There was not as much defoliation in 1930 as there was in 1929, although the disease was moderately abundant in Kings and Annapolis counties. Where the trees were sprayed the disease was well controlled.

P.E.I.-
The disease infected 80 per cent of the leaves causing severe defoliation in Queens county.

POWDERY MILDEW - Podosphaera Oxyacanthae (Fr.) de Bary

Powdery mildew was severe on sand cherries in small areas of the University orchard, Saskatoon, Sask.

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

B.C.-
Brown rot was very destructive on Vancouver island and the lower Fraser valley. On Vancouver island as high as 80 per cent of the fruit was infected in some orchards.

Ont.-
The first recorded appearance of the disease on the fruit was made on June 28. The infection was light.

BLOSSOM BLIGHT - Sclerotinia cinerea Schroet.

Significant damage resulted from blossom blight on

Vancouver island. This disease was also present on prunes.

ARMILLARIA ROOT ROT - Armillaria mellea Fr.

In a block of 5 year old Byngs at Kootenay Lake, B.C. nearly every tree was affected with Armillaria root rot and the affected trees were either dead or dying. The trees had been planted less than a year after the land had been cleared of bush, which had consisted chiefly of deciduous trees - aspen, birch and alder. The disease has been observed before in the past few years, but only an occasional older tree has been killed.

CORYNEUM BLIGHT - Coryneum Beijerinckii Oud.

Coryneum blight was severe on sand cherries in the University orchard, Saskatoon, Sask.

DROUGHT SPOT - Non-parasitic

Drought spot caused only very slight damage on all varieties in the southern Okanagan valley, B.C.

BARK INJURY - Cause undetermined

A Cladosporium was present in the epidermis, but not the deeper tissues of several cherry twigs sent to the Laboratory from Winona, Ont. Isolations were made from the twigs, but inoculations were not carried out. (R. S. Willison)

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

Black knot was moderate to severe on wild cherries in Queens county, P.E.I. Many young trees are destroyed each year by this disease, which is widespread over the province.

CRANBERRY

RED LEAF - Exobasidium Vaccinii (Fuck.) Woron.

This disease was found on wild cranberry in Digby county, N.S. causing red tips on the shoots.

CURRANT

WHITE PINE BLISTER RUST - Cronartium ribicola Fischer

B.C.-

White pine blister rust was general in the lower Fraser valley. Black currants were frequently severely affected.

Ont.-

Considerable rust was present on black currants 2 to 3 miles from the nearest known pine infections near Guelph, Ontario. In Carleton county, rust could be found on susceptible wild Ribes wherever it was looked for.

Que.-

Rust was first observed at Hull, Que., on both black and red currants on June 5. A part of the primary pustules were still unbroken. The bushes were in a garden about 250 yards from an infected pine hedge. The source of infection was probably much closer as the garden was in the shadow of a small grove of mature white pines. From the ground no rust was visible on these trees. White pine blister rust was present everywhere in the Gatineau district on wild Ribes. Susceptible species were invariably rusted.

In Laval county a patch of cultivated black currants were completely rusted and almost totally defoliated. These bushes had produced no crop for several years.

N.B.-

White pine blister rust was widespread throughout the province on both cultivated and wild Ribes. On the Experimental Farm, Fredericton, red and black currants were heavily rusted, especially the latter species.

N.S.-

All the leaves of black currants were infected in a small garden in Colchester county.

P.E.I.-

A light infection occurred late in Queens county. The damage was nil.

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

Ont.-

This disease was common and caused early defoliation of unsprayed bushes in southern Ontario.

N.B.-

A moderate infection of Septoria leaf spot was observed on the Experimental Farm, Fredericton.

P.E.I.-
A light infection was reported in Queens county.

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

A slight infection was observed in a small garden plantation in Colchester county, N.S.

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

B.C.-
Powdery mildew was general on Vancouver island and in the lower Fraser valley. Losses were very heavy in many localities.

Alta.-
The disease was common and frequently severe. It was reported from Edmonton, Lethbridge, Olds, Red Deer and Lacombe.

Sask.-
Powdery mildew was troublesome on black currants at Hillside.

TWIG CANKER - Nectria cinnabarina (Tode) Fr.

Twig blight was not common at the Experimental Farm, Kentville, N.S. However, black currants are not grown extensively.

GOOSEBERRY

WHITE PINE BLISTER RUST - Cronartium ribicola Fischer

Ont.-
Wild gooseberries were found rusted in Carleton and Leeds counties. On the leaves borne on the old wood the individual infections were usually small, but on the new shoots they were numerous and large, frequently involving half the leaf surface of the large vigorous leaves.

Que.-
Rust was reported from Rouville and Kamouraska counties and the Quebec district. The leaves were covered with rust.

N.B.-
Rust was widespread on cultivated and wild gooseberries on the Experimental Farm, Fredericton; 75 per cent of the leaves were heavily infected.

Gooseberry

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

Traces of this leaf spot were observed in Queens county, P.E.I.

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

Septoria leaf spot caused some defoliation at Edmonton and Lethbridge, Alta. Although this disease was not generally important this year in Nova Scotia, a rather severe infection occurred soon after harvest time in one patch in Kings county.

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

Powdery mildew was severe, causing a loss of 75 per cent of the crop at the Experimental Station, Summerland, B.C.

It was also reported as common and often severe in Alberta.

GRAPE

DEAD ARM - Cryptosporella viticola Shear
(Fusicoccum viticolum Redd.)

Dead arm was about as prevalent in 1930 as in 1929, in the Niagara peninsula, Ontario. The leaf symptoms of the disease were very marked this spring. In one vineyard in Lincoln county, 25 per cent of the vines were infected. The affected arms were dying.

BLACK ROT - Guignardia Bidwellii (Ell.) Viola & Ravaz.

A trace was found on the leaves of Campbell's Early in Lincoln county, Ont.

CHLOROSIS - Non-parasitic

Chlorosis was reported in Lincoln county, Ont. The grapes colored prematurely, did not size well and the leaves turned yellow. The disease was confined to the Worden variety.

PEACH

SCAB - Cladosporium carpophilum Thüm

Scab was very prevalent in the Niagara peninsula, Ont. on early varieties such as Rochester, St. John and Greensboro; later varieties were very free. On Aug. 12, in an orchard, in Lincoln county 60-65 per cent of the fruit were scabbed while Elberta was free from infection.

Peach

LEAF CURL - Taphrina deformans (Berk.) Tul.

Leaf curl was general and severe on Vancouver island, B.C. The disease was rare this season in the Niagara peninsula, Ont. Infections were scattered and appeared late in the season. On the other hand leaf curl was unusually prevalent and severe in 1929.

WILT - Verticillium spp.

Verticillium wilt caused partial defoliation of several trees in a 4 year old orchard at the Laboratory of Plant Pathology, St. Catharines, Ont. In a 3 year old orchard of Elberta in Lincoln county 10 per cent of the trees were affected, the infection showing on one side or one limb of the diseased trees. The resulting defoliation of the affected limbs stimulated the affected twigs to produce new buds.

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

Traces of powdery mildew were found on all varieties in southern Okanagan valley, B.C.

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

B.C.-

Brown rot was reported from Vancouver island and the lower Fraser valley. Infection was severe at the Experimental Station, Saanichton.

Ont.-

From observations made in the old orchard of the Laboratory farm, St. Catharines, it was found that a large number of incipient cankers were present on the smaller fruit-bearing twigs. These cankers originated from the pedicels that bore rotted fruit in 1929. In many cankers the disease had spread down the smaller laterals girdling and killing the larger branches. (R. S. Willison) For 1930 apothecia were first observed on May 16, in Lincoln county. Brown rot was of no importance in 1930 either as a blossom blight or as a fruit rot.

CANKER - Cytospora spp.

In 1929 in a 3 year old orchard at the Laboratory farm, St. Catharines, Ont. containing 330 trees, one wound was marked on each tree for further observation. Of the 330 wounds, 234 were due to pruning, 84 due to mechanical injury and 12 due to other causes, chiefly winter injury. In the summer of 1930 when these wounds were examined it was found that 36 or about 9 per

cent had developed cankers due to Cytospora sp., as far as known. Of the pruning wounds not healed in the fall of 1929, 13 per cent became cankered, of those caused by mechanical injury 5 per cent were cankered and of wounds from other causes 15 per cent produced cankers. The estimated damage was 10 per cent. (R. S. Willison)

PEAR

FIRE BLIGHT - Bacillus amylovorus (Burr.) de Toni

B.C.-

Fire blight occurred chiefly on Barletts, although it was observed on all varieties in the Okanagan valley, B.C. Ten per cent of the trees were injured.

Ont.-

Fire blight was general and severe this year being more prevalent than usual particularly as a twig blight. In one orchard of Barletts in Lincoln county, 25 per cent of the twigs were killed by fire blight and in another orchard the trunk of one tree in a block of 50 was half girdled.

Que.-

Although there was a slight amount of fire blight on pear in 1929 none was found on the several varieties examined in Rouville county by June 26. However, by this date the disease had appeared on apple. (See discussion of fire blight on apple).

SCAB - Venturia pyrina Aderh.

B.C.-

Scab was general on Vancouver island and in the lower Fraser valley. Losses were severe, unless control measures were practiced.

Ont.-

The appearance of conidia on twig lesions was first recorded on May 21, on badly cankered twigs of Flemish Beauty in Lincoln county.

Que.-

In one orchard in Rouville county, 40 per cent of the leaves of Clapp's Favorite were infected, with an average of 2 infections per leaf on June 26. A few leaves were nearly covered and already turning yellow. The subsequent damage was probably considerable.

P.E.I.-

One hundred per cent of the fruit of Flemish Beauty was infected, rendering the fruit useless.

DROUGHT SPOT - Non-parasitic

An average loss of 6 per cent of the fruit in all varieties was caused by drought spot in the southern and central Okanagan districts, B.C.

BLOSSOM END ROT - Non-parasitic

This disease occurs mostly on trees set out about 10 years ago in the southern Okanagan district.

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

Three per cent of the fruit of all varieties were damaged in the southern Okanagan valley, B.C.

ANTHRACNOSE - Neofabraea malicorticis (Cordley) Jackson

Anthracnose was general on Vancouver island and in the lower Fraser valley, B.C. Losses were severe unless control measures were practiced.

PLUM

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

Ont.-

Black knot was slightly more prevalent this year especially in neglected orchards, where it has become very destructive. Reine Claude has proven to be very susceptible.

Que.-

In one orchard of 75 trees in Laval county, 100 per cent of the branches were severely damaged. No fruit has been produced and the trees will ultimately be killed. It was claimed that the infection was worse this season although all the knots were cut out last year.

N.B.-

A slight infection was observed on one tree in the Experimental Farm orchard, at Fredericton.

N.S.-

Damage ranging from 3 to 10 per cent was reported on susceptible varieties from Kings county.

Plum

FIRE BLIGHT - Bacillus amylovorus (Burr.) de Toni

Fire blight was reported on plums from Port Haney, B.C. and Stanstead county, Que.

PLUM POCKETS - Exoascus Pruni Fuck.

All the trees in the Agricultural College orchard, Winnipeg, Man. were infected with plum pockets. Although most of the trees had only a small percentage of the fruit diseased, some had as high as 90 per cent destroyed. This disease was also present at Morden, Man.

SILVER LEAF - Stereum purpureum Fr.

Only 3 or 4 trees attacked by silver leaf were observed this year in Kings county, N.S.

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

Brown rot was general on Vancouver island and in the lower Fraser valley, B.C. This disease was also present on prune.

Thirty-five per cent of the fruit were destroyed by brown rot in a garden containing 6 trees at Aylmer, Que.

SHOT HOLE - Coccomyces prunophorae Higgins
(Cylindrosporium prunophorae Higgins)

Shot hole was heavy at Winnipeg, Man. On some trees 100 per cent of the leaves were severely affected.

Shot hole caused considerable defoliation of German Prune and Magnum Bonum in Queens county, P.E.I. Ninety per cent of the leaves were infected.

DROUGHT SPOT - Non-parasitic

Ten per cent of the crop, which is not large, was affected with drought spot in the southern Okanagan district, B.C.

RASPBERRY

SPUR BLIGHT - Didymella applanta (Niessl) Sacc.

Alta.-

A light infection of spur blight was reported from Edmonton

and Lethbridge, Alberta.

Man.-

At the Experimental Farm, Morden a 50 per cent infection was observed on Latham, Hubert and Viking varieties. The disease is also present, to a small extent, throughout that district.

Que.-

Only traces of spur blight were found in 6 plantings of Newman and one of Viking, in Rouville and Nicolet counties, while 3 plantings of Herbert in St. Maurice and Rouville counties were moderately to heavily infected. In the more severe infections all the canes were discolored for 2 to 2½ feet from the ground. The disease was more severe in the older plantations.

N.S.-

Spur blight was in general less severe this year than in 1929, especially in young plantations, which were practically free from disease. In old patches of Herbert in Kings, Annapolis and Digby counties up to 60 per cent of the canes were slightly infected.

P.E.I.-

Spur blight is an important disease in this province. Viking seems least susceptible.

MOSAIC AND LEAF CURL - Virus Diseases

B.C.-

Five per cent of the plants were affected with mosaic in the Okanagan valley.

Alta.-

Mosaic caused moderate damage in the University gardens, Edmonton.

Ont.-

Mosaic affected 100 per cent of the plants in several plantations at Collingwood. Leaf curl and mosaic were general in a plantation in Lincoln county.

Que.-

Infections varying from a trace to 4 per cent were reported from 12 plantations of Newman scattered in several counties. The disease was worse in old plantations. Herbert was free from mosaic. In one plantation it was growing next to diseased Newman. Two per cent of the plants of Viking were affected in one planting. A single plant of Newman affected with leaf curl was found in one plantation in Rouville county.

Raspberry

N.B.-
Thirty per cent of the plants were affected with mosaic in the Experimental Station plantation at Fredericton, while leaf curl was observed on 3 per cent of the plants.

N.S.-
In Kings county no mosaic was observed on Herberts and only 3 per cent of the Viking plants were affected. Roguing has kept the disease well in check in young plantations. Mosaic affected 75 per cent of the plants of an unknown variety in a planting in Colchester county.

P.E.I.-
Mosaic was responsible for the destruction of many promising plantations. Viking was practically free.

ANTHRACNOSE - Plectodiscella veneta Burkh.
(Gloeosporium venetum Speg.)

Anthracnose was general on Vancouver Island and in the lower Fraser valley, B.C. causing significant damage.

In Joliette and Nicolet counties, Que., a trace of anthracnose was observed on Newman raspberries, while in Yamaska, L'Assomption, Rouville, Iberville and Quebec counties infections ranging from 50 to 100 per cent were reported on the same variety. In Iberville county Herbert raspberries growing next to diseased Newmans were free from anthracnose. In heavy infections as much as 10 per cent of the new shoots had their tips killed by the disease, stunting their growth. Vikings showed a trace in Rouville county.

Anthracnose was severe on the upper third of the canes, causing a die back on the fruiting canes, in Digby county, N.S.

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

One hundred per cent of the leaves were infected on Herbert raspberries in Hull, Rouville and St. Maurice counties, Que. Infection caused premature defoliation, but as it did not take place until late in the season the damage was usually slight.

Sixty per cent of the leaves were infected, causing severe defoliation in Digby county, N.S. Leaf spot is not prevalent in a young thrifty patch adjoining the infected section.

CANE BLIGHT - Leptosphaeria Coniothyrium (Fuck.) Sacc.

Cane blight was general on Vancouver island and in the lower

Fraser valley, B.C. causing significant damage.

Only two specimens of cane blight were found on the Experimental Station plantation at Fredericton, N.B.

In a plantation of Herbert in Digby county, N.S. the plants that were sprayed in 1929 and pruned early showed infections varying from 0 to 25 per cent, while 75 per cent of the canes were affected in the unsprayed sections.

BLUE STEM WILT - Verticillium ovatum Berkeley & Jackson

This disease was more prevalent than usual in Ontario, especially on Viking variety, infection ranging from 2 to 10 per cent.

MISCELLANEOUS DISEASES

KUEHNEOLA RUST - Kuehneola uredinis (Lk.) Arth.
Rust attacked 40 per cent of the leaves in a plantation of Viking in Kings county, N.S. causing the leaves to dry up. Infections were also found on late fruit.

POWDERY MILDEW - Sphaerotheca Humuli (DC.) Burr.
Raspberry mildew was abundant on certain varieties at Edmonton, Alberta.

PHRAGMIDIUM RUST - Phragmidium imitans Arth.
Infection from rust was general and the damage was significant on Vancouver island and in the lower Fraser valley, B.C.

CROWN GALL - Pseudomonas tumefaciens (E.F. Sm. & Towns.) Dugg.
General on Vancouver island and in the lower Fraser valley, B.C. causing insignificant damage.

BACTERIAL FLOWER BLIGHT
A flower blight caused by bacteria, was general on Vancouver Island and the lower Fraser valley. The organism appears to be an undescribed species (W. R. Foster).

STRAWBERRY

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

Sask.-
A heavy infection of this leaf spot was reported from St. Gregor.

Man.-
The only report of leaf spot in Manitoba was from a field near

Winnipeg, where 75 per cent of the plants were infected.

Ont.-
A heavy infection of leaf spot was reported from Lincoln county.

Que.-
Heavy infections of 60 to 100 per cent were reported on several varieties of strawberries from Quebec, L'Assomption and Terrebonne counties.

N.B.-
Leaf spot of strawberry was widespread and quite important in New Brunswick. A moderate infection was reported from the Experimental Station, Fredericton.

P.E.I.-
This disease was not common this year and therefore of no importance.

POWDERY MILDEW - Sphaerotheca Humuli (DC.) Burr.

Powdery mildew was first observed in a planting in Lincoln county, Ont, on June 3. At this date the damage was slight. In another planting observed June 14, the plants were heavily infected. Bordeaux dust had failed to check the disease and the foliage was burned up and crisp. The dust may have possibly accentuated the burning.

BLACK ROOT - Cause undertermined

Twenty to forty per cent of the plants were affected with black root in two plantings of Premier, in Lincoln county. The disease was especially noticeable on young suckering plants. Many of the affected plants were dead.

GRAY MOULD - Botrytis cinerea Pers.

Gray mould was present on Vancouver island, B.C.
Botrytis was usually found associated with a destructive rot of strawberries in P.E.I.

MOSAIC - Virus

Seventy-five per cent of the plants were affected with mosaic in a planting of Premier in Lincoln. This is the first time this disease has been noticed on Premier. The plants were turning yellow and dying.

Strawberry

CROWN ROT - Corticium Solani (Prill. & Del.) Bourd. & Galz.

Crown rot was found occasionally on Vancouver Island, B.C. causing slight damage.

DISEASES OF FOREST AND SHADE TREES

ASH (Fraxinus)

LEAF SPOT - Gloeosporium irregulare Peck
One tree was severely affected in Yarmouth county, N.S.

BALSAM FIR (Abies balsamea)

WITCHES' BROOM - Melampsorella elatina (Alb. & Schw.) Arth.
This disease was widespread in York county, N.B., although the rate of infection in about 1000 trees only averaged about one per cent.

BEECH (Fagus)

SEEDLING BLIGHT - Botrytis sp.
Very young beech seedlings are destroyed each year by Botrytis in P.E.I.

CANKER - Nectria sp.
This disease is abundant in some blocks of trees at the Experimental Station, Kentville, N.S. (K. A. Harrison)

ROT - Panus stypticus Fr.
This rot is very common in N.S. on beech trees dying from coccus attack.

BIRCH (Betula)

ARMILLARIA ROT - Armillaria mellea Fr.
Two trees attacked by Armillaria were observed in Kings county, N.S.

HEART ROT - Fomes fomentarius Fr.
This disease is very common in P.E.I., killing many trees both young and old.

BUTTERNUT (Juglans)

LEAF SPOT - Marssonia Juglandis (Lib.) Sacc.
Slight to severe infections causing premature defoliation were observed in Hull, l'Assomption and Argenteuil counties, Que. The disease was also observed along the St. Lawrence between Montreal and Quebec, between St. Francois du Lac and Sherbrooke and also between Sherbrooke and Abbotsford.

Butternut

A moderate infection was reported on seven trees along the roadside in the St. John valley, N.B.

ELM (Ulmus)

BLACK SPOT - Gnomonia ulmea (Schw.) Thüm.
A trace was observed in York county, N.B.

ENGLISH WALNUT (Juglans regia)

BACTERIAL BLIGHT - Pseudomonas Juglandis Pierce
This disease is general on Vancouver island, B.C., and causes severe damage on the Experimental Farm, Saanichton.

HAWTHORN (Crataegus)

RUSTS - Gymnosporangium spp.
G. Betheli Kern is quite common on Vancouver island, B.C., on native hawthorns.

Moderate injury to the leaves and flower clusters due to G. clavariaeforme (Jacq.) DC. was observed at the Experimental Farm, Charlottetown, P.E.I. This rust only attacked the grafted variety, C. Oxyacantha var rosea, the stock being immune.

FIRE BLIGHT - Bacillus amylovorus (Burr.) Trev.
C. Oxyacantha var rosea grafted on a hardy stock contracted fire blight from an affected apple tree nearby in P.E.I. (H. T. Güssow)

HEMLOCK (Tsuga)

ARMILLARIA ROT - Armillaria mellea Fr.
Sporophores of this fungus may frequently be found on stumps or partly dead trees in Kings county, N.S.

HORSECHESTNUT (Aesculus)

LEAF SPOT - Phyllosticta sphaeropsoidea Ell. & Ev.
This disease was very prevalent in the western part of N.S., and was especially severe along the coast in Shelbourne and Queens counties.

Moderate to heavy infection was reported from Queens county, P.E.I., causing heavy defoliation although the trees do not seem to suffer in consequence.

JUNIPER (Juniperus)

RUST - Gymnosporangium sp.
This disease is common and readily found in Lincoln county, Ont.

MAPLE (Acer)

TAR SPOT - Rhytisma acerinum Fr.
A trace of tar spot was observed in York county, N.B. Infections were heavy and the damage general on all species of maples except Acer plantinoides in P.E.I.

WILT - Verticillium sp.
Wilt affected 5 per cent of the trees causing defoliation of those diseased in a nursery plantation of young Norway maples in Lincoln county, Ontario.

This disease appears to be on the decrease in N.B. In 1928 and 1929, wilt was widespread and quite serious, but in 1930 only a slight infection was observed on 4 trees out of 40 inspected in the city of Fredericton.

LEAF SPOT - Phyllosticta acericola Cke. & Ell.
This disease is not serious in N.S. but causes unsightly spots on the foliage of Acer spicatum.

A heavy infection was observed on one sugar maple (A. saccharum) in P.E.I. The yellowing of the leaves on this tree was apparently due to the severe attack.

FROST INJURY - Non-parasitic
All the trees were injured by frost on the Experimental Farm and in the village of Ste. Anne de la Pocatière, Que.

HEART ROT - Fomes fomentarius (L.) Fr.
Specimens were easily found in Kings county, N.S., although the disease was not common.

MOUNTAIN ASH (Sorbus)

RUST - Gymnosporangium cornutum (Pers.) Arth.
Only one specimen was collected in York county, N.B.

OAK (Quercus)

LEAF BLIGHT - Gloeosporium nervisequum (Fuck.) Sacc.
A severe infection of Gloeosporium was observed on some native oaks (Q. ?macrocarpa) near Kingston, Ont. Of the different species of Gloeosporium on oak the fungus seem to answer best the

description of G. nervisequum.

HEART ROT - Polyporus sulphureus (Bul.) Fr.
This disease was reported on red oak (Q. rubra) in Kings county, N.S., but as oaks are not common, the disease is rare.

PINE (Pinus)

WHITE PINE BLISTER RUST - Cronartium ribicola Fisch.

Ont.-
In a plantation of pines imported from Germany and planted in 1907, white pine blister rust is still present despite the fact that the cutting out of diseased trees every year has been practiced since 1914. In Lincoln county the aecial stage was reported as being very conspicuous in a block of white pine. Some badly affected trees were also reported from two miles east of Oakville.

Que.-
A severe infection killing about one tenth of the branches was reported from Laval county. These trees are very close to a garden where black currants are growing and are very heavily infected. Two trees were found infected just outside Hull in a young hedge recently transplanted from a nearby wood lot. A single specimen was also observed at Kazubazua. In addition, specimens were sent in from Sixteen Island lake and Montebello, although no information was received as to the extent of the infections.

N.B.-
One specimen was forwarded to the Laboratory from Restigouche county. The disease, however, occurs in scattered areas, but causes only slight damage.

N.S.-
Aecia were reported as abundant at Kentville.

P.E.I.-
Heavy damage was reported from Queens and Prince counties. Blister rust is destroying the few remaining white pines in the province.

BLISTER RUST - Cronartium Comptoniae Arth.

Two specimens found within a few days of each other were observed on Pinus Mugo in a nursery at Sussex, N.B. This is the first time that this disease has been found on imported stock in this province.

WOOD GATE RUST - Peridermium sp.

A few scotch pines (P. sylvestris) on the Ontario Agri-

Pine

cultural College farm are infected with what is apparently this rust. Some galls on the limbs are at least 20 years old.

NEEDLE RUST - Coleosporium Solidaginis (Schw.) Thüm.

Specimens of this rust were sent in from Three Hills, Alberta.

POPLAR (Populus)

LEAF SPOT - Septoria spp.

Leaves of suckers of P. balsamifera were moderately affected at Beaver Creek (R. C. Russell). Leaves of Populus sp. sent in from Rosthern were found affected with Septoria musiva Peck (T. C. Vanterpool.)

INK SPOT - Sclerotinia bifrons Seaver (Sclerotium bifrons Ell. & Ev.)

Only a trace was reported from Rouville and Compton counties, Que.

CYTOSPORA CANKER - Cytospora chrysosperma (Pers.) Fr.

Out of 36 plantations of Russian poplars examined in Alta., 20 were severely damaged, while the others showed a trace to medium damage. Severe damage was observed in the areas around North, East and South Calgary. This disease seems to follow weakening due to the rigours of the climate, such as drought.

Numerous young Russian poplars were partially or entirely killed in the University orchard at Saskatoon, Sask., and the dead limbs were covered with pycnidia.

ROSELLINIA CANKER - Rosellinia pulveracea (Ehrek.) Fuck.

The main trunk of a young, seven foot poplar was killed by this disease. The cankers bore some resemblance to those caused by Hypoxylon pruinatum (Klotzsch) Cke. The fungus was identified by Dr. Dearness.

HYPOXYLON CANKER - Hypoxylon pruinatum (Klotzsch) Cke.

One medium-sized tree of P. tremuloides was being killed by the roadside at Buchanan, Sask. The perithecia contained mature asci. This fungus appears to be killing many scattered trees in the groves in Sask.

FROST INJURY - Non-parasitic

A considerable number of the leaves on P. tremuloides were killed and blackened by frosts in the groves on the higher hills near Dana and Carmel, Sask.

DIE BACK - Fusicladium radiosum (Lib.) Lind

This disease was observed at Sutherland, Sask., on P. tremuloides. It is very destructive to the tender branch tips and sometimes whole groves are attacked.

SPRUCE (*Picea*)

NEEDLE RUST - *Melampsoropsis ledicola* (Pk.) Arth.

Sask.-
Severe damage was reported from the Prince Albert National Park.

Que.-
Heavy infections were reported from Lac Brule.

N.S.-
Fifty per cent of the needles were infected on blue spruce in Lunenburg county and some trees of white and red spruce were defoliated in Shelburne and Yarmouth counties.

P.E.I.-
A general infection, causing evident injury, was observed on blue spruce at the Experimental Station, Charlottetown.

WILLOW (*Salix*)

SCAB - *Fusicladium saliciperdum* (All. & Tub.) Tub.
A heavy infection of scab causing severe damage was reported from Garthy township, Que.

The average infection throughout N.B. amounted to about 65 per cent. Trees attacked three years ago succumbed this season, although a few trees are still alive that were attacked four years ago.

Five to eighty per cent of the twigs were affected in Kings county, N.S.

RUST - *Melampsora Bigelowii* Thüm.
At St. Gregor, Sask., the infection was fairly heavy, but not widespread.

A trace was observed in York county, N.B. This disease occurs only rarely in P.E.I.

TAR SPOT - *Rhytisma Salicinum* Fr.
A heavy infection was reported on a few bushes at Birch Hills, Sask.

CYTOSPORA CANKER - *Cytospora chrysosperma* (Pers.) Fr.
This disease was plentiful on dead limbs of cultivated trees (*S. laurifolia*) in windbreaks around the University at Saskatoon, Sask.

A *Cytospora* sp. causing "twig die-back" occurs occasionally in Kings county, N.S.

Willow

LEAF SPOT - Gloeosporium Salicis West.
Fairly heavy defoliation was reported from Kings county, N.S.

BLIGHT - Physalospora Miyabeana Fukushi
This blight caused local and slight damage in Kings county, N.S.

DISEASES OF ORNAMENTALS

BEGONIA

GRAY MOULD - Botrytis cinerea Pers.
Two Rex begonia were affected at the Experimental Station, Fredericton, N.B.

BARBERRY (Berberis)

RUST - Uropyxis sanguinea (Peck.) Arth.
General on Vancouver island, B.C.

STEM RUST - Puccinia graminis Pers.
Stem rust was collected in York county, N.B. and Eganville, Ont.

CARAGANA

LEAF SPOT - Septoria Caraganae (Jacz.) P. Henn.
A moderate infection was reported on some hedges around Saskatoon, Sask. The disease causes defoliation. It was not as severe as in 1928 when it was first observed by Prof. Fraser.

CARNATION (Dianthus Caryophyllus)

RUST - Uromyces Dianthi (Pers.) Niessl
General but slight infections were reported from B.C.

Rust was severe in a greenhouse at Edmonton, Alta.

The carnations in the Horticultural greenhouses, Experimental Farm, Ottawa, Ont., were severely infected.

A trace of rust was observed on carnations brought into the greenhouse at Aylmer, Que.

LEAF SPOT - Alternaria Dianthi Stev. & Hall
A moderate infection was observed in the greenhouse at Fredericton, N.B. This disease is causing considerable damage throughout the province.

CENTAUREA

POWDERY MILDEW - Erysiphe Cichoracearum DC.
A heavy infection was reported from Lincoln county, Ont.

CHINA ASTER (Callistephus)

YELLOWS - Virus

Sask.-
About 3 per cent of the plants in a bed on the University campus at Saskatoon, Sask., were noticeably diseased.

Ont.-
Aster yellows was prevalent in Lincoln county, causing a yellowing of the plants and a blasting of the blooms.

N.B.-
Severe infection was reported from York county. This disease is widespread and is the most destructive malady of asters occurring in the province.

A disease similar to aster yellows was also found on the following plants, which Kunkel reported subject to yellows: Calendula, Tragopogon, Taraxacum, Lactuca, Erigeron, Tagetes, Gaillardia, Dimorphotheca, Helichrysum, Plantago and Chrysanthymum.

In addition the disease was observed on the following plants, which Kunkel did not report: Helianthus, Rudbeckia, Zinnia, Dahlia, Conopsis, Lavetera, Ageratum, Leontodon, Spergula, Apium and Antirrhinum (D. MacLeod). (See also under Plantago major in the Miscellaneous Section).

WILT - Fusarium conglutinans Woll. var Callistephi Beach

B.C.-
All varieties of asters were infected at Summerland, B.C., causing slight damage. Wilt was also common on Vancouver island.

Sask.-
Wilt was reported as severe at Caderre.

Que.-
Wilt was reported in one garden only in Kamouraska county, where 75 per cent of the plants were infected.

N.B.-
Severe infections were reported in numerous gardens throughout the province. No common varieties are immune to this disease, which has become a serious factor in the production of asters during the past two seasons.

STEM BLIGHT - Botrytis sp.

Stem blight was serious on the Experimental Farm, Saanichton B.C.

China Aster

In Lincoln county, Ont., a wilt caused by Botrytis affected 5 per cent of the plants.

STEM ROT - Corticium Solani (Prill. & Del.) Bourd, & Galz.

Stem rot was occasionally found on Vancouver island, B.C.

RUST - Coleosporium Solidaginis (Schw.) Thüm.

A moderate infection was reported at the Experimental Station, Fredericton, N.B.

CHRYSANTHEMUM

POWDERY MILDEW - Erysiphe Cichoracearum DC.
General and quite severe in greenhouses in B.C. It also occurred this year in the field.

YELLOWS - Virus

Severe infections were observed in York county, N.B.

DAHLIA

YELLOWS - Virus
Severe infection was reported from York county, N.B.

BUD ROT - Botrytis spp.
Bud rot was occasionally found on Vancouver island, B.C.

TUBER ROT - Bacillus sp.
This disease is widespread and causes considerable damage in fancy varieties in N.B. A severe infection was observed at the Experimental Station, Fredericton.

GLADIOLUS

SCAB - Bacterium marginatum McC.
Scab was common on Vancouver island and in the lower Fraser valley, B.C. Damage was severe in certain locations only.

MOSAIC - Virus
Plants were observed on Vancouver island, B.C., apparently affected with mosaic.

HOLLYHOCK (Althaea)

RUST - Puccinia Malvacearum Bert.

B.C.-

Rust was very serious on Vancouver island and in the lower Fraser valley, particularly after the seedling year.

N.B.-

A severe infection was reported from the Experimental Station at Fredericton.

N.S.-

This disease was general on the older plants in Hants county.

P.E.I.-

Slight to severe infection was observed throughout P.E.I. This disease is very difficult to control in this province by any known method.

LEAF SPOT - Septoria malvicola Ell. & Ev.

Septoria leaf spot was very common in Quebec county, Que., causing considerable damage.

WILT - Sclerotinia sp.

Five plants were affected at the Experimental Station, Fredericton, N.B.

HONEYSUCKLE (Lonicera)

POWDERY MILDEW - Microphaera Alni (Wallr.) Wint. var Loniceræ (Schlecht.) Salm.

Seventy-five per cent of the leaves were infected at the Experimental Farm, Ste. Anne de la Pocatière.

TWIG BLIGHT - Diplodina tatarica Allesch.

The twigs on one side of a bush were affected and apparently were being killed by this fungus at Beaverlodge, Alberta.

IRIS

LEAF SPOT - Didymellina macrospora Kleb.

B.C.-

Leaf spot was reported from Enderby and also from Vancouver island, where the damage was severe in many gardens.

Sask.-

A trace was reported on Rose Unique at Indian Head.

P.E.I.-
Leaf spot affected about 75 per cent of the leaves causing severe damage to the plants.

RHIZOME ROT - Bacillus carotovorus L.R. Jones

Rhizome rot was found occasionally in B.C.

Fifty per cent of the plants were badly diseased in two gardens in York county, N.B. This disease was widespread in 1930.

RUST - Puccinia Iridis (DC.) Rabh.

A trace was found on Iris versicolor growing wild in York county, N.B.

LARKSPUR - (Delphinium)

POWDERY MILDEW - Erysiphe Polygoni DC.

Sask.-
Fairly heavy infections on the lower leaves were reported.

N.B.-
A severe infection was observed at the Experimental Farm, Fredericton. This disease is general.

P.E.I.-
Powdery mildew was present on all the plants causing slight damage in 2 gardens in Queens county.

BACTERIAL BLIGHT - ?Pseudomonas Delphinii (E.F.Sm.) Stapp

Several severely affected plants were observed in Yarmouth and Annapolis counties, N.S.

LILAC (Syringa)

POWDERY MILDEW - Microsphaera Alni (Wallr.) Salm.
Slight damage was reported from Queens county, P.E.I.

LILY (Lilium)

BLIGHT - Botrytis ?cinerea Pers.
Many plants were very severely blighted or killed in Yarmouth county, N.S.

NARCISSUS

BLIGHT - Botrytis spp.
Slight damage was reported from B.C.

NEMATODES - Tylenchus dipsaci (Kühn) Bast.
General and serious in B.C.

PANSY (Viola)

POWDERY MILDEW - Sphaerotheca Humuli (DC.) Burr. var fuliginea (Schlecht.) Salm.
Slight damage was reported from Summerland, B.C.

PEONY (Paeonia)

BLIGHT - Botrytis Paeoniae Oud.

Sask.-
Severe on peonies chiefly as root and stem rot at Moosomin. At Indian Head a slight infection of the buds caused a loss of 2 to 4 per cent of the blooms.

N.B.-
Slight infections were reported at the Experimental Station, Fredericton. The disease was not important in 1930.

N.S.-
Varieties at the Experimental Station, Kentville, showed 0 to 20 per cent of the stalks injured. This disease is general throughout the province; many urgent requests have been received from growers for control measures.

P.E.I.-
The infection is difficult to estimate. The young shoots were affected as well as flower buds. The fungus seem to overwinter and grow saprophytically upon the old dead parts of the plants.

PRIMULA

GRAY MOULD - Botrytis cinerea Pers.
Two diseased specimens were found in the Experimental Station greenhouse, at Fredericton, N.B.

ROSE (Rosa)

RUST - Phragmidium spp.

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

Rose

valley. The infection was severe on many varieties.

Sask.-

Rust was found at Saskatoon and Sutherland on wild roses. At Saskatoon the rust was probably Phragmidium speciosum while the Sutherland specimens were infected by a leaf inhabiting species.

Ont.-

A severe infection was reported from Lincoln county.

N.B.-

Roses were moderately infected at the Experimental Station, Fredericton.

N.S.-

Several plants in two rose gardens in Yarmouth county, showed 75 per cent of the leaves infected.

P.E.I.-

Two per cent of the leaves of Rosa odorata were infected in a garden in Queens county.

BLACK SPOT - Diplocarpon Rosae Wolf.

B.C.-

Infection was general and, on many varieties, severe.

Sask.-

A heavy infection was reported on La Reve variety in the Experimental rose plots at Saskatoon, while other varieties were hardly affected. At Indian Head, one yellow-flowered variety was severely infected while several other varieties showed no trace of black spot.

Que.-

Infection was severe on young crowded plants but only a slight amount was present on old plants in a regular bed in Chambly county. The damage was only slight, causing a retardation of growth in the young plants.

N.B.-

A moderate infection was reported from the Experimental Station at Fredericton. The disease is widespread and causes considerable damage.

LEAF SPOT - Cercospora rosaecola Pass.

Heavy infections of leaf spot were observed at St. Gregor and Beaver Creek, Sask., on native roses.

Rose

WILT - Verticillium sp.

A single plant, killed by wilt, was reported from Lincoln county, Ontario.

POWDERY MILDEW - Sphaerotheca pannosa (Wallr.) Lév.

Powdery mildew was general and on many varieties severe, on Vancouver island and in the lower Fraser valley, B.C.

A general infection causing the curling of the leaves and blasting of the blossom buds was observed in Lincoln county, Ont.

INFECTIOUS CHLOROSIS - Cause unknown

A slight localized infection was reported from the lower Fraser valley, B.C.

A slight infection was also found at the Experimental Station, Fredericton, N.B.

CANE BLIGHT - Leptosphaeria Coniothyrium Fuck.

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

SWEET PEA (Lathyrus)

POWDERY MILDEW - Erysiphe Polygoni DC.
Slight to severe damage was reported from Queens county, P.E.I.

BUD DROP - Non-parasitic
The sweet peas were moderately affected with bud drop in 4 gardens in York county, N.B. The disease is only of local importance.

ROOT ROT - Cause undetermined
Sixty per cent of the plants were moderately affected with root rot in 14 gardens examined in York county.

ROOT BURN - Non-parasitic
The use of excessive amounts of wood ashes caused severe root burn in one garden in York county.

SNAPDRAGON (Antirrhinum)

RUST - Puccinia Antirrhini Diet. & Holw.
B.C.-
Snapdragons were heavily rusted on Vancouver island and the

lower mainland; the damage was severe.

Sask.-
A heavy infection was reported from one garden in Saskatoon.

N.B.-
In two greenhouses in Fredericton, 60 per cent of the plants were moderately infected. The disease was unusually severe this season in greenhouses.

N.S.-
Two beds at Hebron were severely infected, the infection being traced to the greenhouse.

ROT - Corticium Solani (Prill. & Del.) Bourd. & Galzin.

This rot is common on Vancouver island, B.C., but causing little damage.

TULIP

COLOUR BREAKDOWN - Virus
Five per cent of the tulips were affected at Summerland, B.C.

BLIGHT - Botrytis Tulipae (Lib.) Lind
A very serious infection was reported from the Experimental Station, Saanichton, B.C. This disease is worse some years than others.

VINCA

RUST - Puccinia Vincae
Specimens submitted from Toronto, Ont., proved to be infected with this rust.

ZINNIA

WILT - Fusarium spp.
Sixty per cent of the plants at Summerland B.C., were damaged by wilt. The disease was very bad in the plot used for breeding experiments.

DISEASES OF MISCELLANEOUS PLANTS

The information here reported on parasitic fungi was received from collaborators. Time unfortunately has not permitted the recording of the fungi collected about Ottawa this summer, as a large portion of the collections remain to be examined. All records that would duplicate last year's report are also omitted.

Agropyron cristatum J. Gaertn.
Claviceps purpurea (Fr.) Tul. Edmonton, Alta.

Agropyron dasystachyum (Hook.) Scribn.
Claviceps purpurea (Fr.) Tul. Cayley, Alta.

Agropyron repens (L.) Beauv.
Puccinia graminis Pers. Forty-five per cent of the plants were moderately rusted at the Experimental Station, Fredericton, N.B. Common this year in York county.
Claviceps purpurea (Fr.) Tul. Edmonton, Alta. Also 5 per cent of the plants moderately affected at the Experimental Station, Fredericton, N.B.

Agrostis palustris Huds.
Puccinia graminis Pers. Twenty per cent of the plants were moderately rusted at the Experimental Station, Fredericton. Widespread this year in York county.

Amaranthus retroflexus L.
Cystopus Bliti (Biv.) Lév. Plants moderately affected at the Experimental Station, Fredericton, N.B.

Amelanchier alnifolia Nutt.
Apiosporina Collinsii (Schw.) v. Höhnel. Saskatoon, Sask.

Anenone cylindrica A. Gray
Puccinia Clematidis (DC.) Lagerh. Sutherland, Sask.

Anticlea elegans (Pursh) Rydb.
Puccinia atropuncta Peck. & Clint. III Saskatoon, Sask. Rather rare.

Arabis brachycarpa (T. & G.) Britton
Puccinia monoica (Peck.) Arth. This rust is common on the high banks of the South Saskachewan river at Saskatoon, Sask. It is probably the first rust to appear there each spring. This year the pycnia were collected April 21, and the aecia on May 20. (R. C. Russell)

Arisaema Trifolium (L.) Schott
Uromyces Caladii (Schw.) Farl. Fredericton, N.B. June 15, 1930.

Artemisia sp.
Puccinia universalis Arth. 0 & I St. Gregor, Sask.

Calamagrostis canadensis (Michx.) Beauv.
Claviceps purpurea (Fr.) Tul. Nestow, Alta. The grass was severely infected over a large area in the sand hills (zone 10). (A. W. Henry).

Calamovilfa longifolia (Hook.) Hack.
Puccinia amphigena Diet. III Sutherland, Sask. The rust is common on this host. Nemexia lasioneuron (Hook.) Rydb. (Smilax herbacea Coult.) was growing within a few rods of this location. (R. C. Russell.)

Capsella Bursa-pastoris (L.) Medic.
Cystopus candidus (Pers.) de Bary Lincoln county, Ontario.

Chrysopsis hirsutissima Greene
Puccinia Stipae (Opiz.) Arth. I. Saskatoon, Sask. "This is the first time that P. Stipae has been reported on this host in Saskatchewan, as far as I am aware. It is listed in the North American Flora on C. villosa in Montana". (R.C. Russell).

Cirsium arvense L.
Puccinia sauveolens (Pers.) Rostr. This rust is very prevalent throughout Annapolis and Kings counties, N.S. (J. F. Hockey).

Cirsium sp.
Puccinia Cirsii Lasch II. St. Gregor, Sask.
Uromyces Junci (Desm.) Tul. O.I. Saskatoon, Sask. Common on the native "bull" thistle.

Clematis ligusticifolia Nutt.
Puccinia Clematidis (DC.) Lagerh. O.I. Saskatoon, Sask. This rust was heavy on a vine growing under cultivation. (C.H. Bryce).

Crataegus chrysocarpa Ashe
Gymnosporangium clavariaeforme (Jacq.) DC. Pycnia were well developed on July 3 and the aecia were past their best on July 31, at Saskatoon, Sask.

Elymus condensatus Presl.
Claviceps purpurea (Fr.) Tul. Pincher Creek, Alta.

Eupatorium purpureum L.
Erysiphe cichoracearum DC. Collected in P.E.I.

Galium boreale L.
Puccinia rubefaciens Johans. III. Battleford, Saskatoon and Humboldt, Sask. The rust was heavy at the last place. The sori were surrounded by reddish borders.
Phoma elliptica Peck. appeared to be killing a patch of Galium boreale at Saskatoon, Sask. The stems showed lesions and the

leaves were yellowing and then turning dark. Last year's stems which were still standing were covered with pycnidia of a fungus, which was identified as Phoma elliptica by Dr. Dearness (R.C. Russell).

Glaux maritima L.
Puccinia Distichlidis O.I. Undora, Sask. Light infection.

Glycyrrhiza lepidota (Nutt.) Pursh
Uromyces Glycyrrihizae (Rabh.) P. Magn. Saskatoon, Sask. The telia were scattered irregularly over the leaf and therefore looked quite different from the systemic uredinia. The uredinial stage was also collected at Saskatoon and Humboldt.

Grindelia squarrosa (Pursh) Dunal
Puccinia Grindeliae Peck. III. Saskatoon, Sask. A fairly heavy infection was found in an open pasture.

Halerpestes cymbalaria (Pursh) Greene
Puccinia Clematidis (DC.) Lagerh. O.I. Common on this host about Saskatoon, Sask.

Helianthus subtuberosus Bourgeau
Puccinia Heliathi Schw. III. Saskatoon, Sask. Infection fairly heavy.

Hordeum jubatum L.
Ustilago Lorentziana Thüm. This smut was collected 8 times in zones 2-4 and 10-11 in Alta. The infections were local. One collection also made near Windermere, B.C., (G.B. Sanford). It was collected at Indian Head, Sask.
Puccinia graminis Pers, Ferintosh and Jarrow, Alta.

Iva axillaris Pursh
Puccinia intermixta Peck. I. Allan, Sask. Heavy systemic infection was found on some plants.

Juncus balticus Willd.
Uromyces Junci (Desm.) Tul. III. Saskatoon, Sask., Sept., 16, 1930. The rust was heavy and common. Cirsium near by bore pycnia and aecia on July 1.

Juncus longistylis Torr.
Uromyces Silphii (Burr.) Arth. (U. Junci-tenuis Syd.) II. III. Saskatoon, Sask., Sept. 1, 1930.

Lactuca pulchella (Hook.) Kuntze
Puccinia hemisphaerica (Pk.) Ell. & Ev. O.I. Radisson and Tessier, Sask.

Lappula Lappula (L.) Karst.
Peronospora Echinospermi Swingle Locally on a patch of blue burr at Saskatoon, Sask.

Leontodon autumnalis L.
Yellows (Virus) Five per cent of the plants, Kings county, N.S.
Puccinia Hieracii (Schum.) Mart. Queens county, P.E.I. Infection light.

Lepidium densiflorum Schrad.
Peronospora Lepidii (McAlpine) G. W. Wilson. The downy mildew produces witches broom on the host. This disease is common around Saskatoon, Sask. (R.C. Russell)

Limonium carolinianum (Walt.) Britton
Uromyces Limonii (DC.) Lév. Queens county, P.E.I. Plants noticeably injured.

Lygodesmia juncea Don.
Puccinia patruelis Arth. I. Saskatoon, Sask. Not abundant.

Malvastrum coccineum (Pursh) Gray
Puccinia Sherardiana Korn. III. Saskatoon and Glenside, Sask.

Nabalus racemosa (Michx.) DC.
Puccinia orbicula Pk. & Clint. III. St. Gregor, Sask. Common in the Humboldt district.
Puccinia patruelis O. I. St. Gregor, Sask.

Norta altissima (L.) Britt. (Sisymbrium altissimum L.)
Peronospora parasitica (Pers.) de Bary Saskatoon, Sask. Material collected Sept. 16, bore an abundance of oospores in the affected areas. These spots were overgrown with Alternaria. (E. G. & R. C. Russell).
Cystopus candidus (Pers.) de Bary Saskatoon, Sask. Trace found.

Oenothera biennis L.
Uromyces plumbarius Peck. O. I. Kentville, N. S. Few plants found.
Erysiphe Polygoni DC. York county, N.B.

Phalaris arundinacea L.
Claviceps purpurea (Fr.) Tul. Clyde, Alta.

Phlox Hoodii Richards.
Puccinia Douglasii Ell. & Ev. O. I. Saskatoon, Sask. The aecial stage is found occasionally in this district.

Plantago major L.
Yellows (Virus) Affected plants were collected by Mr. Groh in the lawn of the Arboretum, Experimental Farm, Ottawa, Ont., in May. The disease has been noted in previous seasons. Plants of the common milk weed (Asclepias syriaca L.) and toadflax (Linaria vulgaris Hill) were also collected by Mr. Groh, in Ottawa West. Diseased plants were sent to Dr. L. O. Kunkel. He reported that the symptoms were typical of yellows, but he had never seen it on toadflax, nor had he tested the plant experimentally.

Erysiphe Cichoracearum DC. Severe and widespread this season in York county, N.B.

Poa pratensis L.
Claviceps purpurea (Fr.) Tul. Midnapore, Alta.

Physalis ?heterophylla Nees
Puccinia Physalidis Peck. A heavy infection on plants in an orchard in Rouville county, Que.

Potentilla viridescens Rydb. and P. ?flabelliformis Lehm.
Phragmidium Ivesiae Syd. III. Saskatoon. This species is not collected as commonly as P. Potentillae in this area.

Potentilla sp.
Phragmidium Potentillae (Pers.) Karst. York county, N.B.

Portulaca oleracea L.
Cystopus Portulacae (DC.) Lév. Plants moderately infected at Experimental Station, Fredericton, N.B.

Prunus melanocarpa (A. Nels.) Rydb.
Dibotryon morbosum (Schw.) Theiss. & Syd. conidial stage collected at Qu'Appelle, Sask. July 13, 1930.

Prunus pennsylvanica L. f.
Coccomyces hiemalis Higgins (Cylindrosporium Padi Karst.)
A moderate infection of this shot hole was reported from Saskatoon.

Prunus virginiana L.
Dibotryon morbosum (Schw.) Theiss. & Syd. Quite severe on chokecherry in vicinity of Agricultural College, Winnipeg, Man. It was also reported from Neepewa, Man. A severe infection was observed at Hawkesbury, Ont. The disease is severe in many parts of New Brunswick on chokecherry and related species. (D.J. MacLeod)

Pulsatilla ludoviciana (Nutt.) Heller.
Puccinia suffusca Holw. Saskatoon, Sask. This rust is not very common.

Rhamnus cathartica L. (escaped)
Puccinia coronata Corda Trace collected June 3, at Fairy Lake, Que.

Rubus ?melanolasius Focke
Mycosphaerella Rubi Roark (Septoria Rubi West.) The imperfect stage was abundant in a sheltered valley of a creek at Beaver Creek, Sask.

Rubus strigosus Michx.
Pucciniastrum americanum (Farl.) Arth. Queens county, P.E.I.

Rubus triflosus Richards
Gymnoconia Peckiana (Howe) Trotter Severe at Experimental Station, Fredericton, N.B. The disease is widespread in the province on this species.

Sabina horizontalis (Moench.) Rydb.
Gymnosporangium juvenescens Kern. Sutherland, Sask. This rust causes witches' brooms on the host. It is quite common along the river.
Gymnosporangium corniculans Kern. Sutherland, Sask. This rust is fairly common on the steep slopes of the river bank where Sabina and Amelanchier grow in fairly close proximity to each other.

Sanicula marilandica L.
Puccinia marylandica Lindr. St. Gregor, Sask. Aecia collected June 5, and telia July 16 and August 29. Rust was not plentiful although the host was abundant.

Sideranthus spinulosus (Pursh.) Sweet
Puccinia Grindeliae Peck. Southey, Sask. Heavy infection.

Solanum triflorum Nutt.
Entyloma australe Speg. Saskatoon, Sask. Not very plentiful this year, although common in some years.

Solidago sp.
Coleosporium Solidaginis (Schw.) Thüm. York county, N.B.

Stieronema ciliatum (L.) Raf.
Puccinia Dayi Glint. III. Saskatoon, Sask. Heavy infection. Also collected at Englefield, Sask.

Symphoricarpos occidentalis Hook.
Puccinia Crandallii Pamm. & Hume O. I. Carmel, Sask.
Septoria Symphoricarpi Ell. & Ev. Lyston and Saskatoon, Sask.

Taraxacum officinale Weber
Puccinia Hieracii (Schum.) Mort. Very common in Lincoln county, Ont. Abundant in Nova Scotia.
Sphaerotheca Humuli (DC.) Burr. var fulginea (Schlecht.) Salmon Common and severe in York county, N.B.
Ramularia Taraxaci Karst. Indian Head, Sask. Very common.

Tithonia speciosa Hook. (cult.)
Sclerotinia Sclerotiorium (Lib.) de Bary Experimental Station, Morden, Man. Plants completely destroyed. The seed from which these plants were grown was imported from South Africa.

Vicia Cracca L. (Cow vetch)
Erysiphe Polygoni DC. Queens county, P.E.I. Apparently injurious.

Vicia sparsifolia Nutt.
Uromyces albus Diet. & Holw. O.I. Saskatoon, Sask., May 19; and

Radisson, Sask. Common about Saskatoon. The rust changes the habit of the host. The plant is erect instead of decumbent and is also modified in other ways.

Viola canadensis L.
Puccinia Violae (Schum.) DC. Saskatoon, Sask.

Viola sp.
Puccinia Violae (Schum.) DC. York county, N.B.

INDEX OF HOSTS

Only the names of the cultivated plants have been included in this index. For diseases on plants not under cultivation the section on "Diseases of Miscellaneous Plants" should be consulted.