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DOMINION OF CANADA,
DEPARTMENT OF AGRICULTURE,
EXPERIMENTAL FARMS BRANCH.

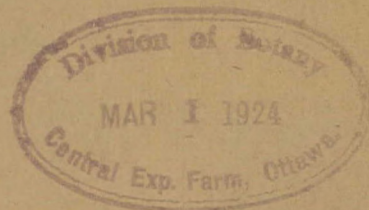
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SURVEY OF THE
PREVALENCE OF PLANT DISEASES
IN THE
DOMINION OF CANADA.

1923.

FOURTH ANNUAL REPORT.



EDITED BY

F. L. DRAYTON,
Plant Pathologist

I N T R O D U C T I O N

The following report deals with the prevalence of plant diseases in the Dominion of Canada during the year 1923. It includes 102 host plants, with information on 333 diseases. These may be divided as follows:

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CEREAL DISEASES

WHEAT

STEM RUST, caused by Puccinia graminis Pers.

B.C.-

Either absent or present in very small amount in the mixed farming districts. No *Berberis* spp. were noticed in this region, which may account, in part at least, for the comparative freedom from this disease.

Alta.-

The areas affected were much extended this year, and the disease was more prevalent than in any other year, but was too late to do much serious damage. At Beaverlodge and the College of Agriculture in Edmonton the infection was slight.

Sask.-

The rust first appeared on barberries in Saskatoon on May 28. On June 29 it was collected on Hordeum jubatum, Agropyron tenerum and A. Smithii in the vicinity of the barberries at Saskatoon. On July 7, aecia with spores discharged were found at Regina. On July 10, uredospores found on Hordeum jubatum at Weyburn. Localized. On July 11, collected on wheat at Weyburn and Midale, a few pustules only. On July 19, collected on wheat at Saskatoon. On July 20, traces at Rosthern. The losses in the province as a whole were very considerable. At Indian Head, rust appeared to become quickly established on Kubanka, which lodged badly. On Ruby, the infection was mostly primary, but with some secondary in addition.

The disease soon became general over the south of the province, doing much damage, especially to late crops. The degrees of infection noted in various parts of the province are herewith tabulated:

<u>Losses up to 10%</u>	<u>Losses up to 25-50%</u>	<u>Losses up to 75-100%</u>
Scott	Assiniboia	Moose Jaw
Francis	Admiral	Vanguard
Wolseley	Scotguard	
Grenfell	Ponteix	
Broadview	Griffin	
Sintaluta	Weyburn	
Saltcoats	Wymark	
	Indian Head	
	Swift Current	
	Neville	
	Shaunavon	
	Yorkton	(Fraser & Simmonds)

Man.-

Spring floods left some of the soil in a very wet condition at seeding time, and in some areas crops were drowned out by heavy rains or high water. There was ample rainfall during the season over some of the western part of the province, although the summer was rather dry in the Red River Valley and adjacent areas. The temperature was generally high during July. Pycnia were first found on May 31 at Winnipeg, and the aecia were open first on June 5. This was somewhat later than usual, on account of the backward spring. The uredo stage on wheat was found in considerable quantity in a small local area on winter wheat (Dawson's Golden Chaff) at Brandon on July 5. Infection may have started there from spores from a barberry bush, although

no barberries were within a mile or more.

By July 6, 5 to 10% primary infection was common in Southern Manitoba, and a lighter scattering of primary infections existed very generally elsewhere (Portage la Prairie, Carberry, Dauphin). Subsequent development of the rust was very rapid; on July 18, in central and southern Manitoba infection was practically universal, and the severity was commonly 70 to 80%.

A trip was taken by boat over Lake Winnipeg, and a week (August 11 to 16) spent at Norway House on the 54th parallel. Stem rust was found along the shore of the lake in lessening quantities as we went north. At Norway House the rust was quite common on timothy, indicating over-wintering there. A trace was found on oats; none was found on wheat, but a great deal of search finally revealed a couple of pustules on Hordeum jubatum. The oats, wheat or rye forms had apparently blown there, and were just beginning to show by the middle of August. About thirty barberry plantings, for the most part of one, two or three bushes, located this year, were quite generally rusted, but there was no indication of rust having spread from them significantly, in advance of the general epidemic.

Throughout the province rust was very serious, causing about 50% loss of the wheat that was harvested, amounting to a reduction of about 35,000,000 bushels, or in

money value from 15 to 35 million dollars. These losses were greater this year than in any year since 1916.

(Bisby & Bailey)

The losses experienced in different parts of the province are herewith tabulated.

<u>Losses up to 25%</u>	<u>Losses up to 30-50%</u>	<u>Losses up to 75-100%</u>
Plum Coulee	Franklin	Letellier
Elm Creek	Gretna	Morris
Minitonas	Snowflake	Emerson
Shoal Lake	Inwood	St. James Co.
Argyle	Strathclair	Stonewall
La Riviere	Erickson	
Gladstone	Swan River	
Neepawa	Morden	
Portage la Prairie		
Carman		

Ont.-

Reports were received from Thunder Bay, Essex and Algoma showing very severe infections in those localities. One from West Whitley indicates an infection there of moderate severity.

Que.-

Reports from Matane and Sherbrooke show severe infestations.

N.S.-

Severe infections in Piedmont and Merigomish, and slight injury in Colchester County were reported.

P.E.I.-

A summary from this province reports a moderate infection, averaging 10%.

LEAF RUST, caused by Puccinia triticina Eriks.

Alta.-

Generally prevalent, but not enough to do any serious damage. Quite severe at the College of Agriculture in Edmonton.

Sask.-

Generally prevalent in Northern Saskatchewan. First collection made July 3 at Indian Head, occurring commonly after this date, later becoming severe and killing many leaves.

Man.-

General, with infections ranging from 8 to 25%, but for the most part, the losses were slight. It is not serious on the commonly grown varieties of spring wheat, but Kota and the winter wheats were heavily infected at the Experimental Farm at Brandon.

Ont.-

Prevalent in the Sault Ste. Marie district and in severe form.

P.E.I.-

A general infection, averaging about 10%.

BUNT or STINKING SMUT, caused by Tilletia laevis Kühn
and Tilletia Tritici (Bjerk.) Wint.

B.C.-

In the central section of the province very little of this disease was observed, even where the seed had not been treated.

Alta. and Sask.-

Very little of this observed.

Man.-

Unusually rare. Not reported except occasionally in experimental plots.

Ont.-

Apparently absent.

P.E.I.-

Rare, and where found, only to the extent of 1%.

LOOSE SMUT, caused by Ustilago
Tritici (Pers.) Jens.

B.C.-

General, but of small account, and rarely reaching more than 2%.

Alta. and Sask.-

Small percentage, not exceeding 1%, present generally.

Man.-

Fairly common, infections ranging from a trace to 2%.

Que.-

A number of reports indicate the presence of a trace except from Matane and Bonaventure Counties, in which infections averaging 12% were found.

N.S.-

At least 5% was found in all untreated plots at Nappan; Ruby, Huron, Marquis and Bishops having considerable, Early Red Fife, Red Fife and White Russian only a trace.

P.E.I.-

Infections varying from 1% to 3% found in isolated areas.

ERGOT, caused by Claviceps purpurea (Fr.) Tul.

Alta. and Sask.-

There was more present than usual. It was not general, but many plots at the Experimental Stations and Agricultural Colleges showed a small percentage.

Man.-

No record.

P.E.I.-

One field containing 5% was found in Prince Co.

SCAB, caused by Giberella Saubinetii (Mont.) Sacc.

Man.-

At Brandon the plots showed infections ranging from a trace to 5% in the spring wheats, Marquis giving the highest counts, the Durums showing no infection. The perfect stage was found for the first time by Messrs. Bisby and Bailey on old corn stalks of the 1922 crop in the field, but it has not been found causing injury to the corn.

P.E.I.-

A slight infection reported.

FUSARIUM BLIGHT, caused by Fusarium spp.

Alta.-

More prevalent than usual, although not severe in any place.

Sask.-

In northern Saskatchewan, some plots were found with as much as 5%. At Indian Head a slight infection was observed. This disease generally was more prevalent than usual.

FOOT ROT, caused by Fusarium spp.

At Brandon, some specimens were sent in or noted where the roots were severely rotted. The plants, in many cases, had made almost normal growth and were well headed out. However, they ripened slightly sooner than normal plants and practically no seed was found in the heads. (I.L. Conners)

TAKE-ALL, caused by Ophiobolus cariceti (Berk. et Br.) Sacc.

Present and severe in a field of wheat in northern Saskatchewan. Not found elsewhere. (W.P. Fraser)

GLUME BLOTCH, caused by Septoria nodorum Berk.

Alta. and Sask.-

Of general occurrence and worse than usual. Practically every place visited in these provinces showed more or less of this disease. The leaves, nodes and glumes were severely attacked. This was specially noticeable on plants broken down by the wind or cut down by the saw fly. Probably the death of the leaves caused some reduction in yield. (W.P. Fraser)

In Saskatchewan, observations by P.M. Simmonds showed the following approximate distribution of infections:

<u>Trace</u>	<u>Moderate</u>	<u>Severe</u>
Antler	Scott Shaunavon Moose Jaw Weyburn Griffin Grenfell Arcola Rouleau	Sintaluta Moosomin Indian Head

Man.-

In the south-west this disease was prevalent on the Experimental Farm at Brandon, Boissevain and Deloraine. The leaves were heavily infected and 10 to 15% of the heads showed lesions on the glumes. It probably did a slight amount of damage. In the western part of the province considerable developed, causing often a conspicuous blotching of the glumes. The disease was found at the Agricultural College, but caused no noticeable damage in the Red River Valley.

Que.-

A few collections were made at Macdonald College.

P. E. I.-

This disease was not observed.

HEAD BLIGHT and FOOT ROT, caused by
Helminthosporium sativum P.K.et B.

In Alberta and Saskatchewan this disease was more common than usual, especially as a foot rot. It appeared in a large number of fields, but with no great damage resulting, as only plants here and

there were attacked. In south-western Manitoba it was collected frequently on wheat, but caused no appreciable damage except occasionally on Durum wheats, where the nodes were affected.

A root rot probably caused by this fungus occurred to a considerable extent in Alberta at Beaverlodge and in Saskatchewan at Scott, Indian Head, Moosomin, Moose Jaw and Shaunavon. Local cases of this also occurred in Manitoba.

POWDERY MILDEW, caused by Erysiphe graminis DC.

In Alberta this was present to a limited extent on winter wheat. In Quebec, at Macdonald College there was the heaviest infection for some years.

BASAL GLUME ROT, caused by Bacterium atrofaciens McC.

Alta.-

Very prevalent throughout the province. At Edmonton some varieties were heavily infected; at Lacombe infection seemed worse on Red Bobs, Early Red Fife and Early Triumph.

Sask.-

In the northern part of the province it was prevalent; in some fields a large percentage of heads were affected. In the southern part infections were general, the following distribution being reported:

<u>Trace</u>	<u>Moderate Infection</u>
Indian Head	Weyburn
Griffin	Sintoluta
Grenfell	Moose Jaw
Wymark	Shaunavon
Swift Current	

Man.-

Traces were noted at the Brandon Experimental Farm. Dawson's Golden Chaff showed approximately 5% heads slightly attacked.

BLACK CHAFF, caused by Bacterium
translucens undulosum S.J. & R.

Some specimens of this disease were found in Manitoba, but the damage was slight.

PHYSIOLOGICAL DISEASES

WHITE TIP

The top part of the head is dead and bleached and was probably the result of extremely hot weather during July. A trace was found in Saskatchewan, but in Manitoba it was more prevalent and severe.

KRINKLE JOINT

At Indian Head, a rod row of the variety Preston was found to contain 10% of affected plants.

OATS

STEM RUST, caused by Puccinia graminis Pers.

Alta. and Sask.-

Prevalent in northern Saskatchewan and extended into Alberta. It was not as severe there as in southern Saskatchewan, where the approximate distribution was as follows:

<u>Slight</u>	<u>Moderate</u>
Ponteix	Swift Current
Shaunavon	Wymark
Yorkton	Assiniboia
	Moose Jaw

Man.-

In the south-west the disease was much slower in making its appearance on oats than on other cereals. A single pustule was collected at Cartwright on July 16. On July 19 a trace infection was collected on the plots at Brandon, one to four pustules on a few plants being found. On August 8 at Manitou, 40% infection, half in the telial stage, was found. At Cartwright 30 to 40% infection was common; one field later than the rest showed 50% infection and was injured to some extent. At Boissevain the infection averaged 20%. In general the injury was slight through this area. (I.L. Connors)

In the south-east this disease was abundant and doing considerable damage. Much of the early crop escaped, but in all sections the late crop and in many sections the whole crop was severely injured. (Bisby and Bailey)

The approximate distribution is as follows:

<u>Slight</u>	<u>Moderate</u>	<u>Severe</u>
Elm Creek	Emerson	Stonewall
Letellier	Tretna	Minitonas
Shoal Lake	Swan River	Dauphin
Wood Bay	Erickson	Morris
Portage la Prairie	Strathclair	
	Morden	
	Carman	

Ont.-

One report from Lanark Co., where the infection was severe and the heads not filled. Reports from Algoma and Ontario Counties also show general prevalence and in severe form.

Que.-

Prevalent in the Eastern Townships, although not affecting early varieties such as Daubeney and Alaska, to any extent.

N.S.-

General infections reported from Hants and Colchester Counties, but not causing much reduction in yield.

P.E.I.-

In Queens and Kings Counties slight infections are reported.

CROWN RUST, caused by Puccinia coronata Cda.

Sask.-

The aecial stage of this rust was severe on buckthorn in some districts. There was a marked development of the rust at Saskatoon and other districts in northern Saskatchewan.

In southern Saskatchewan the approximate distribution of infection was as follows:

<u>Slight</u>	<u>Moderate</u>	<u>Severe</u>
Shaunavon Sintoluta Weyburn	Assiniboia	Indian Head

Man.-

In the south-west the disease was severe in the general region of Boissevain. Two buckthorn hedges were located, one in town and another on a farm one mile south of the town; both of these were heavily infected. The hedge on the farm was planted on high ground about two hundred yards from an oat field. Early examinations showed no striking differences in infection, but later in the season the infection on the sheath showed slightly higher near the buckthorn. The infection on the leaves was 65% and on the sheaths 10 to 20%. At Cartwright there was 10% leaf rust and at Manitou 50%, there being no noticeable sheath infection. At Brandon a medium infection was noticed. (I.L. Connors)

In the south-east buckthorns were generally but lightly infected. Infection on oats was patchy, depending apparently on the proximity of the buckthorns. Some damage was done in local areas, but in general slight. (Bisby & Bailey)

The approximate distribution of infections was as follows:

<u>Slight</u>	<u>Moderate</u>	<u>Severe</u>
Neepawa	Erickson	Strathclair
Gladstone	Shoal Lake	Swan River
Morden	Carman	Dauphin
	Portage la Prairie	
	Minitonas	
	Morris	

Ont.-

Moderate infections reported from the following districts: Sudbury, Missisquoi, Essex and Thunder Bay.

N.S.-

In Colchester County a ten-acre field is reported as being generally infected without much apparent injury.

SMUTS, caused by Ustilago Avenae (Pers.) Jens. and Ustilago levis (K. & S.) Magn.

B.C.-

General, but almost entirely of the covered type. Occasionally as high as 40% in untreated seed, but not over 5% on the average.

Alta.-

One report from Beaverlodge indicates that the disease is present in that neighbourhood but is well controlled by formalin seed treatment.

Sask.-

The covered smut was common in many fields, in some being as high as 10 to 25%. Not much loose smut was observed. The approximate distribution was as follows:

<u>Trace</u>	<u>Slight</u>	<u>Moderate</u>
Moosomin	Grenfell	Rouleau
Carlyle	Shaunavon	Moose Jaw
Estevan		
Swift Current		

Man.-

In the south-west these smuts are not uncommon. Counts made in three different fields showed approximately 10% in each case. Smutted plants were dwarfed, being about one-third shorter than the normal ones. They seemed to mature less rapidly, and consequently smutted plants showed 80% stem rust infection against 40% on normal plants. Liberty (hulless) oats showed upwards of 50% infection at the Brandon Experimental Farm. (I.L. Conners)

In the south-east, infections were about the same as usual, ranging from 0 to 2%, with occasional fields going higher. (Bisby & Bailey)

Severe infections were noted in Minitonas and slight at Morden and Elm Creek.

Ont.-

The following reports indicate the approximate distribution:

<u>Slight</u>	<u>Moderate</u>	<u>Severe</u>
Frontenac	Ontario	Hastings
Renfrew	Temiskaming	Thunder Bay
Carleton	Essex	
	Sudbury	

Que.-

The reports received indicate the following approximate distribution:

<u>Slight</u>	<u>Moderate</u>
Matane	Bonaventure
Sherbrooke	Stanstead
Rimouski	

N.B.-

Untreated seed showed infections ranging from 4 to 50%.

Treated seed in the same districts showed 0 to 5%.

N.S.-

At Nappan there was considerable smut in the Liberty variety; in others there was a trace only. In Antigonish, Colchester and King's Counties infections were moderate.

P.E.I.-

Reports from the three counties indicate infections ranging from 1 to 5%.

ANTHRACNOSE, caused by Colletotrichum cereale Manns.

This disease was reported from southern Saskatchewan. The nodes and bases of the leaves were the parts mostly affected. At Indian Head, field counts gave 60% of the plants affected. It was less severe and common in other districts, such as Weyburn, Moose Jaw and Shaunavon. (P.M. Simmonds)

POWDERY MILDEW, caused by Erysiphe graminis DC.

One report from Macdonald College, Quebec, where the infection was the heaviest for some years.

LEAF SPOT BLOTCH, caused by
Leptosphaeria avenaria Weber

This disease was found on the Experimental Farm at Brandon. Typical pynnidia (Septoria avenae Frank) were found scattered among telia of crown rust. An ascomycete which agreed with Weber's description of

Leptosphaeria avenaria was also present in one collection.

Dr. Bisby kindly corroborated these observations. Ascospore measurements gave length 16-28 u, average 23 u; width about 5 u. Twenty-five pynospores gave length 18-36 u, average 25.8 u; width 2-3 u. This material may have been slightly immature.

(I.L. Connors)

LEAF DISCOLORATION, caused by Helminthosporium sp.

Quite common in southern Saskatchewan.

HALO BLIGHT, caused by Bacterium coronofaciens Elliott

This disease is common on the leaves of oats in northern Saskatchewan and Alberta.

PHYSIOLOGICAL DISEASES

BLASTING OF HEADS

In southern Saskatchewan it is reported as common at Shaunavon and Indian Head. The heads contain a number of non-fertile flowers, the glumes being white and dead.

LEAF BLIGHT

In the rotation experimental plots at the Central Experimental Farm, one field has for ten years failed to yield healthy oat plants. In the early summer of 1923 the diseased condition again appeared. When the plants are four or five inches high the leaves develop pale patches with brown or reddish edges, and finally droop and wither. Large dead areas occurred in the field, which quickly became filled with weeds, principally Polygonum pennsylvanicum. This is apparently the same disease as the one described in Europe as "Grey Speck" or "Yellow Tip", vide Abstracts in the Review of Applied Mycology, Vol.1, pp. 417 and 421. Dr. Dickson reports a similar disease occurring in the oat plots at Macdonald College, with losses ranging from 20 to 80%.

BARLEY

LOOSE SMUT, caused by Ustilago nuda (Jens.) K. & S.

Alta.-

One report from Beaverlodge, stating that this smut has been prevalent, but is now well controlled by the hot water treatment.

Sask.-

Not as prevalent as usual.

Man.-

Fairly common, but percentages of infection low.

At Brandon some differences in varietal susceptibility

were noted as follows:

Charlotte No.80	0	Himalayan	Tr.
Trebi	0	Stella	0
Albert	Tr.	Manchurian	Tr.
Junior	6%	Chinese White	Tr.
O.A.C.No.21	0	Bearer	0

- Ont.-- From four reports the average infection appears to be approximately 2%.
- Que.-- Average infection about 4%.
- N.B.-- One report indicating a 2% infection.
- P.E.I.-- Three reports average 3% infection.

COVERED SMUT, caused by
Ustilago Hordei (Pers.) K. et S.

- Sask.-- Considerable present in many fields, in some cases 10% was observed.
- Man.-- Generally present; infections from trace to 5%.
- Ont.-- Infection average less than 1%.

STEM RUST, caused by Puccinia graminis (Pers.)

- Alta. and N.Sask.-- Common in northern Saskatchewan and extending into Alberta.
- S.Sask.-- Moderate infections in Vanguard, Moose Jaw and Indian Head; slight in Francis.
- Man.-- In the south-west it was observed on barley as soon

as wheat. At Cartwright on July 16 a light infection from a trace to 5% was observed in one field. At Killarney it was slightly heavier and at Boissevain 1 to 2 pustules on a few plants were found. At Manitou on August 8, two fields showed 30% and 60% respectively, similar infections being found at Cartwright and Boissevain. At Brandon, the plots showed great variation, running up to 50%. This disease probably caused little injury except in late seedings.

(I.L. Connors)

In the south-east it was abundant and injurious, especially on late sown barley.

The approximate distribution of infections was as follows:

<u>Slight</u>	<u>Moderate</u>	<u>Severe</u>
Morden	Neepawa	Tretna
Snowflake	Portage la Prairie	St. James
Dauphin		Stonewall
Carman		Letellier
Gladstone		Morris

Que.-

One report from Sherbrooke County, in which the infections were slight, Himalayan being apparently resistant.

P.E.I.-

Infection slight.

LEAF RUST, caused by
Puccinia simplex (Koern.) Eriks. & Henn.

Alta.-

None observed at Beaverlodge.

Man.-

A trace was found at Winnipeg in 1922, but it was not

observed in 1923.

P.E.I.-

A slight infection in Queens Co.

NET BLOTCH, caused by Helminthosporium teres Sacc.

Alta.-

Very prevalent, at Lacombe being worse on the varieties Stella and Manchurian.

Sask.-

Much more prevalent than usual. In some varieties practically all the fields were attacked.

At Indian Head and Carlyle 50% infections were found, and at Grenfell 25%.

Man.-

Occasional collections were made.

P.E.I.-

Not observed.

SPOT BLOTCH, caused by
Helminthosporium sativum P.K. et B.

Alta. and N.Sask.-

Observed as a head blight, but was not prevalent.

Man.-

In the south-west it was collected in almost every field of barley examined, but there is evidently considerable varietal difference in the plots at Brandon. As high as 70% of the leaf surface was covered in some instances, while nodes and spikelets showed some injury. In the south-east it was fairly general, but light infection.

P.E.I.-

Not observed.

STRIPE DISEASE, caused by
Helminthosporium gramineum Rab.

Alta.-

At Edmonton a few plots showed 2 to 3% infection.

Sask.-

General, but only a small percentage present.

Man.-

In the south-west it was not definitely observed.

In the south-east it was less than usual; only occasionally found.

LEAF SPOT, caused by
Rynchosporium secalis (Heins.) Davis

Prevalent at Scott, Lacombe, Edmonton and other districts in northern Alberta. No collections were made in northern Saskatchewan. In southern Saskatchewan, at Indian Head 10% of the plants were affected, in some cases severely. The disease was more severe than last year, but this was probably due to the wet season.

LEAF BLOTCH, caused by Septoria passerini Sacc.

Sask.-

General, but of slight importance.

Man.-

Collected at Boissevain.

Que.-

Reported from Macdonald College as common on the leaves of some varieties, which were unthrifty. It is, however, not troublesome on any variety which is suited to climatic conditions.

ERGOT, caused by Claviceps purpurea (Fr.) Tul.

A trace found at Indian Head, Sask. At Morden, Man., it was common but not severe, about 2% of the plants being affected, with not more than two kernels to a spike ergoted.

POWDERY MILDEW, caused by Erysiphe graminis DC.

The heaviest infection for some years reported from Macdonald College, Quebec.

BACTERIAL BLIGHT, caused by
Bacterium translucens J.J. et R.

In south-western Manitoba it was collected frequently early in the season, but apparently did little damage and was totally obscured later by spot blotch.

RYE

STEM RUST, caused by Puccinia graminis Pers.

Man.-

Not observed in either the south-east or south-west of the province.

R.E.I.-

Not observed.

LEAF RUST, caused by Puccinia dispersa Eriks.

Alta.-

General, but not doing any serious damage.

Sask.-

General in northern Saskatchewan, but not resulting in serious damage.

In southern Saskatchewan, at Indian Head, moderate infections were found.

Man.-

Observed at Brandon, Morden, Neepawa and Winnipeg, but not serious.

P.E.I.-

Not observed.

ERGOT, caused by Claviceps purpurea (Fr.) Tul.

B.C.-

Found occasionally.

Alta.-

Much more prevalent than usual in northern Alberta.

About 2 to 3% of the heads infected at Edmonton.

Sask.-

Present in northern Saskatchewan but not severe. A 10% infection noted at Indian Head.

Man.-

Loss not great in the south-east; less than usual.

In the south-west it was found at Morden, Brandon and Manitou to the extent of 5% at the latter place.

Ont.-

Less than 1% in the Thunder Bay District, a reduction in amount as compared to other seasons.

Que.-

Infection of $\frac{1}{2}$ % found at Macdonald College.

N.S.-

A severe infection of 25% in Pictou County.

POWDERY MILDEW, caused by Erysiphe graminis DC.

In Manitoba considerable infection was observed on fall rye, but the damage was negligible. At Macdonald

College, Quebec, the heaviest infection for some years was recorded.

DOWNY MILDEW, caused by
Peronospora trifoliorum de Bary

Quite severe on some plots at Lacombe, Alta.; not observed elsewhere.

SMUT, caused by Urocystis occulta (Wallr.) Rab.

Looked for in Manitoba, but not found.

FORAGE AND FIBRE CROPS

ALFALFA

LEAF SPOT, caused by Pseudopeziza medicaginis (Lib.) Sacc.

B.C.-

The usual amount present, not serious.

Alta. and Sask.-

Present, but not doing any serious damage.

Man.-

In the south-east it was common, but did not cause much damage in the vicinity of Winnipeg, perhaps because of dry conditions.

In the south-west present, less common than the yellow leaf blotch.

Ont.-

Observed on practically all the alfalfa in the Thunder Bay District, but not causing serious injury.

Que.-

One report from Sherbrooke County, where the disease appeared on the second crop, but was not serious.

N.B.-

Very prevalent on lower leaves of all experimental plots.

N.S.-

Of general occurrence at Kentville, with considerable defoliation in places; infection fairly well confined to lower leaves.

P.E.I.-

Present to a small extent.

YELLOW LEAF BLOTCH, caused by
Pyrenopeziza medicaginis Fckl.

This was the most noticeable disease of alfalfa at the Brandon Experimental Farm, Manitoba, this year. The imperfect stage (Sporonema phacidioides) was collected in abundance. It may have caused a small amount of leaf drop. It was also found at Indian Head, Saskatchewan, and Winnipeg, Manitoba.

LEAF SPOT, caused by Pleosphaerulina briosiana Pol.

A new spot was found at the Experimental Farm, Brandon, Manitoba, this year. It is characterized by a white centre with brown to black, slightly raised margin. Black perithecia were visible in the large spots (4m.m. in diameter). Dr. Bisby kindly verified this determination. This parasite has been reported in the United States Plant Disease Survey as occurring in Georgia and other southern states. (I.L. Connors)

LEAF SPOT, caused by Ascochyta medicaginis Bres.

A trace found in south-eastern Manitoba. (Bisby & Bailey)

ROOT ROT or WILT, caused by Sclerotinia sp.

B.C.-

Causes considerable damage in the breeding work at Point Grey.

Man.-

Some occurred in 1922, but it was not found in 1923.

DOWNY MILDEW, caused by Peronospora Trifoliorum deB.

B.C.-

Occasional along irrigation ditches and wet spots, but as yet of no economic importance. At the Experimental Station at Invermere, one field was found badly affected.

Alta.-

Considerable present in some plots at Lacombe.

Man.-

Considerable present in one field at Winnipeg.

RUST, caused by Uromyces striatus Schr.

In Essex, Ontario, in one field every leaf showed sori up to ten in number. (T.G. Major)

YELLOW LEAF, cause unknown

One report from Point Grey, B.C., where it was present to a considerable extent.

CLOVERS

POWDERY MILDEW, caused by Erysiphe sp.

Sask.-

Common, no perithecia were found.

Man.-

In the south-east considerable occurred again this year and caused some damage. Careful search throughout the summer and autumn failed to reveal a perithecium. There is a marked difference in susceptibility between plants in a field, and resistant strains will probably be obtained. (Bisby & Bailey)
In the south-west it is reported as present, but of

no economic importance.

Ont.-

Reported as being general in Welland, Hastings, Lanark, Carleton, Thunder Bay District, Essex, Kent, Rainy River District. In a report from Harrow the statement is made that the degree of infection on both the first and second crops is apparently increasing.

Que.-

Reported as general and on the increase in Mississquoi, Matane, Sherbrooke and Stanstead Counties.

N.B.-

Common throughout the season, but no perithecia found.

N.S.-

In Colchester and King's Counties, several reports of its general occurrence. In the Annapolis Valley it is reported as present to a very considerable extent on second growth, in some cases stunting the growth somewhat.

P.E.I.-

Moderate infection. Not as severe as last year.

RUST, caused by Uromyces spp.

B.C.-

Present to a considerable extent at Agassiz.

Man.-

Both U. fallens and U. Trifolii occurred but the injury was slight. Aecia of the latter were found on June 1.

Que.-

Reported as slight in Mississquoi and Stanstead Counties.

N.S.-

Reported as general and in some spots severe in Col-

chester and King's Counties.

P.E.I.-
Slight infection.

ROOT ROT or WILT, caused by
Sclerotinia Trifoliorum Eriks.

B.C.-
This disease has been noted at various places in the province, particularly at Point Grey, where the damage was considerable. Great differences in susceptibility between various strains were noted. (P.A. Boving)

Man.-
Some found in 1922, but none in 1923.

P.E.I.-
Not observed.

SOOTY SPOT, caused by
Phyllachora Trifolii (Pers.) Fckl.

In Manitoba this was found on white and red clovers, not so common on the latter. In the Thunder Bay District of Ontario it was found on red clover growing in waste land. Infection was general over plants, but not common in the district as a whole.

LEAF SPOT, caused by
Pseudopeziza Trifolii Fckl.

B.C.-
While fairly prevalent, did not seem to be serious and probably did not influence the yields to any noticeable extent. (P.A. Boving)

Ont.-
One report indicates its presence on the bank of Rainy River, but not a serious infestation.

- Que.- Reports from Missisquoi and Sherbrooke Counties indicate slight infections.
- N.S.- Of general occurrence in Colchester, Kings, Annapolis and Yarmouth Counties, with slight injury.
- P.E.I.- A slight infection in Queen's County.

ANTHRACNOSE, caused by
Gloeosporium caulivorum Kirch.

This disease occurred in the plots of the Agrostology Division at the Central Experimental Farm, Ottawa, 16 to 60% of the plants in these plots being killed. The seed from which these plots was grown was of European origin.

MOSAIC, cause unknown

- B.C.- This is a serious disease at Point Grey and causes much trouble in the breeding work.
- Man.- Some found, but with little apparent damage.
- Que.- One report from Missisquoi County, where it was present to a slight extent.
- P.E.I.- Not observed.

CORN

SMUT, caused by Ustilago Zeae (Beck.) Ung.

Sask.-

One report from Saltcoats, where there was a local infection amounting to 3%.

Man.-

Considerable present, about the usual amount. Infections ranging from 3 to 5% reported from Winnipeg, Brandon, Portage la Prairie and Morden.

Ont.-

Infections ranging from 3 to 7% reported from Harrow, Essex County, Sudbury District, Frontenac, Welland, Leeds and Carleton Counties.

Que.-

Two reports indicating slight infections in Matane and Sherbrooke Counties.

P.E.I.-

Not observed.

RUST, caused by Puccinia Sorghi Schw.

In Manitoba this disease is reported as fairly common, but apparently doing no damage.

EAR and ROOT ROTS, caused by Fusarium spp.

In Manitoba the root rot was not observed, although the perfect stage (*Giberella saubinetii*) was found on old corn stalks in a wheat field. (Bisby & Bailey)
Ear rots, while present in Manitoba, are not common.

FLAX

RUST, caused by Melampsora Lini (Pers.) Desm.

Sask.-

One field of 100 acres in northern Saskatchewan, north of Humbolt, showed very severe infection and in Neville there was a 50% infection.

Man.-

Apparently less than usual. Marked differences in varietal susceptibility. ND1114 was injured considerably. (Bisby & Bailey)

P.E.I.-

Not observed.

WILT, caused by Fusarium Lini Bolley

Sask.-

A slight infection noted at Francis.

Man.-

Considerable developed; more than has been reported heretofore. Resistant varieties should be used, especially on old land.

Ont.-

This disease made its first appearance at the Central Experimental Farm, Ottawa, this year, causing extensive injury to 35 one-fortieth acre plots in the breeding work of the Cereal Division. The infection progressed during the season along the lines of surface drainage, apparently indicating a spread by water in the soil.

STEM BREAK, caused by Polyspora Lini Lafferty

Severe in two one-fortieth acre plots at the Agricultural College, Saskatoon, Sask. The determination was made by W. E. Brentzel. Vide Jour. Dept. of Agr. for Ireland, Vol. XXI, No. 2, 1921. (W.P. Fraser)

HEAT CANKER (Physiological)

In Manitoba these cankers did considerable injury and were apparently the result of the hot weather in late June and early July. (Bisby & Bailey)

At the Central Experimental Farm, Ottawa, these cankers were observed in June doing considerable damage to the experimental plots of the Cereal Division. (H.T. Güssow)

GRASSES

TIMOTHY (Phleum pratense L.)

RUST, caused by Puccinia graminis
Phlei-pratensis Eriks. et Henn.

B.C.-

In other years, this disease has caused considerable injury, but this season the attacks have been less severe. Considerable difference is found between various strains as to their resistance to this disease.

Man.-

Common, but not serious. The rust appears early and must over-winter in the uredinial stage. The following is an approximate distribution of infections:

Moderate

Portage la Prairie
Neepawa
Edmonton

Severe

Dauphin
Snowflake

Que.-

One report from Sherbrooke County indicates the presence of this disease, but no serious loss.

P.E.I.-

Severe in a few fields; average infection moderate.

LEAF SPOT, caused by
Scolecotrichum graminis Fckl.

Some found in south-eastern Manitoba, but damage slight.

(Bisby & Bailey)

LEAF SPOT, caused by
Heterosporium Phlei Gregory

A little of this was found at Winnipeg. (Bisby & Bailey)

SQUIRREL-TAIL (*Hordeum jubatum* L.)

RUST, caused by Puccinia graminis Pers.

In south-western Manitoba the infection was heavy at the close of the season. Collections were not made, however, until after infection had appeared on wheat.

(I.L. Connors)

The approximate distribution of infections in Manitoba was as follows:

<u>Slight</u>	<u>Moderate</u>	<u>Severe</u>
Elm Creek	Tretna	Morris
Fisher Branch	Letellier	
Simli	Carman	
Purves	Snowflake	
Morden	Wood Bay	
Plum Coulee	Harbor	
Portage la Prairie		

MISCELLANEOUS GRASSES

Puccinia Clematidis (DC.) Lag.

Agropyron tenerum Vasey - Other species of Agropyron,
Bromus sp. and Elymus sp. in Saskatchewan.
(W.P. Fraser)

Puccinia graminis Pers.

Reported from Manitoba on -

Agropyron Smithii Rydb.
Hordeum jubatum L.
Elymus Macounii Vasey
Agropyron tenerum Vasey
Elymus canadensis L.
Elymus virginicus L.
Agropyron repens (L.) Deaux.
Elymus curvatus Piper
Dactylis glomerata L.

In Saskatchewan severe infections were reported on all
susceptible grasses, species not specified.

Puccinia Andropogonis Schw.

Reported from Manitoba on -

Andropogon furcatus Muhl.
Andropogon scoparius Michx.

Claviceps purpurea (Fr.) Tul.

The following hosts and the locality in which they were
found, were reported as follows:

Agropyron caninum (L.) Beauv.	Man.
Agropyron dasystachum (Hook.) Scribn.	Sask.
Agropyron repens (L.) Beauv.	Que. & Man.
Agropyron Richardsonii (Trin.) Shrad.	Man.
Agropyron Smithii Rydb.	Man. & Sask.
Agropyron tenerum Vasey	Man.
Bromus inermis Leyss.	Man.
Dactylis glomerata L.	Man.
Elymus Macounii Vasey	Man.
Lolium perenne L.	B.C.
Phleum pratense L.	Man.
Poa pratensis L.	Man.
Spartina cynosuroides (L.) Roth.	Man.
Stipa vividula Trin.	Man.
Scolochloa festucacea (Will'd.) Link.	Man.

Ustilago Agropyri Clinton

Agropyron tenerum Vasey	Man. & Sask.
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Ustilago perennans Rostr.

Arrhenatherum elatius (L.) Beauv.	B.C.
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Sphacelotheca occidentalis (Seym.) Clinton

Andropogon furcatus Muhl.	Man.
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Piricularia grisea (Cke.) Sacc.

Holcus sorghum sudanensis (Piper) Hitchc. (Sudan grass)	Man.
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Pseudomonas sp.

Holcus sorghum sudanensis (Piper) Hitche. (Sudan grass)	Man.
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MILLET

SMUT, caused by Sorosporium Syntherismae (Peck) Farl.

Specimens of this disease were forwarded from Lacombe,
Alta. It was not seen elsewhere. (W.P. Fraser)

SUNFLOWER

RUST, caused by Puccinia Helianthi Schw.

Alta.-

Collections were made in this province.

Sask.-

General in northern Saskatchewan. A slight infection at Indian Head.

Man.-

In the south-west it was present in the experimental plots at Brandon, doing little damage. At Morden it was severe, affecting 65% of the leaves. A row of sunflowers at Brandon used as a windbreak around a flower garden, had 100% of the leaves infected, with numerous lesions on the petioles and stems. Rust on wild sunflowers was also noted. (I.L. Connors)
In the south-east it was common and caused some defoliation, but was not serious.

Ont.-

Present at the Central Experimental Farm, Ottawa, but not serious.

Que.-

Present at Macdonald College, but not as common as last year.

P.E.I.-

Not observed.

WILT or DROP, caused by
Sclerotinia sp. probably libertiana

B.C.-

At Point Grey it has not caused extensive damage, but in certain parts of the interior, both around Kamloops and in the Okanagan, the losses have been considerable.

(P.A. Boving)

A sample of seed was sent to the Central Laboratory, Ottawa, from Quilchena, containing large numbers of sclerotia, some being of a shape which would conform to the spaces between the seeds on the head. Seed contaminated in this way would be difficult to free from sclerotia, because of the general similarity of shape and size to that of the seed. Plants from seed of this kind would have little chance of escaping infection.

(F.L. Drayton)

Alta.-

One or two diseased plants found at Lacombe. Not observed elsewhere.

Man.-

Some occurred; probably the worst sunflower disease this year. In a windbreak at Brandon 50% of the plants were affected.

Ont.-

Present at the Central Experimental Farm, Ottawa, but not to the same extent as last year.

Que.-

Present for the first time in Arthabasca County, a small amount.

P.E.I.-

Infections of this disease on the increase; 75% infection noted in one field.

POWDERY MILDEW, caused by
Erysiphe cicoracearum DC.

Common late in the season in Manitoba, causing little or no damage.

DOWNY MILDEW, caused by
Plasmopara Halstedii Farl.

Present to a small extent at the Central Experimental Farm, Ottawa.

LEAF SPOT, caused by Septoria Helianthi E, et K.

Some found at Winnipeg and Morden, Manitoba.

GREY MOULD, caused by Botrytis sp.

Found attacking the leaves and growing points of several varieties at Lacombe, Alta.

CHLOROSIS, cause unknown

Very marked on about 25% of the plants at the Experimental Farm, Scott, Saskatchewan.

SWEET CLOVER

STEM CANKER, caused by Ascochyta caulicola Lau.

This disease was present at Olds, Alta., and Saskatoon, Sask. (W.P. Fraser) At the former place, about 2% of the plants in the plot examined were completely killed

and about 6% affected, causing a total loss of 5% (H.S. MacLeod). This disease has also been found at Indian Head, Sask., and in Manitoba, but has never before been reported from Western Canada.

MOSAIC, cause unknown

Common in the vicinity of the Experimental Station at Summerland, B.C. In Manitoba it is sometimes found.

STEM ROT, caused by Botrytis sp.

One sweet clover cover crop in the Summerland district, B.C., was found to be dying off with a stem rot due to a Botrytis sp.

FRUIT DISEASES

APPLE

SCAB, caused by Venturia inaequalis (Cke.) Wint.

B.C.- Coast and Kootenay -

Severe in the Kootenays. Unsprayed McIntosh showed 100% infection in some localities. Northern Spy and Newtown also showed high infection. McIntosh sprayed four times showed 10 to 25% infection in some cases, especially along the Arrow Lakes. In the Creston Valley, the most important apple producing area in this section, spraying resulted on the whole in satisfactory control. At the coast, this disease was more prevalent than last year, but not generally severe.

Okanagan and Salmon Arm -

Owing to an unusually wet spring, infection was quite general and more severe than formerly, except in southern Okanagan, Grand Forks, Creston and Keremos. In many orchards where no spraying was carried out, practically all apples were unmarketable. In Agassiz scab was not as abundant as usual.

Man.-

Common, but not serious.

Ont.- Frontenac Co. -

All orchards of Snows and McIntosh affected to the extent of 75% with 25% reduction in value. Where Bordeaux mixture was used, there was little damage.

Thunder Bay District -

General, but not causing much damage.

Essex Co. -
Observed on all unsprayed trees.

Niagara District -
Not as prevalent as last year.

Que.-
Where the ordinary spray schedule was carried out,
this disease was completely controlled.

N.B.-
One orchard in King's County showed 20% leaf and 35%
fruit infections on McIntosh. Baldwins in the same
orchard had less than 1%. Considerable difficulty
was experienced by growers in getting efficient con-
trol with spray schedules at present recommended.
Some heavy infection reported on McIntosh and Dudley
in York County. Unsprayed orchards showed up to 100%
on leaf and fruit. (Hockey and Richardson)

N.S. -Annapolis -
This was the only apple disease which did not show a
marked decrease in prevalence during 1923, being some-
what more abundant.

King's Co. -
Infections ranging from 2 to 7%.

Cumberland Co. -
Bad in most varieties. McIntosh were very bad this
year, even though sprayed three times with lime sul-
phur and arsenate of lime.

Hants Co. -
Infection averaged 3 to 5%; severe where orchards are
not well sprayed.

Pictou Co.-
Most of the orchards in the eastern section of the

county are small and uncared for. All varieties badly infected. Fruit fit only for local market and home consumption.

P.E.I.-

Only a slight amount present this year

BLACK ROT, caused by Physalospora Cydoniae Arn.

Man.-

Common on leaves and in some cases severe at the Morden Experimental Station. Cankers were rare, and the damage slight.

Ont.-

Reported from Essex County and the Niagara District; not serious in either locality.

Que.-

In Sherbrooke County it is general and serious. In Bonaventure County many of the trees are more or less affected, but the trees are not sprayed.

N.S.-

Reported as present in Annapolis, Digby, King's and Hants Counties, causing considerable leaf injury and some cankers.

P.E.I.-

Not observed.

JUNIPER RUST, caused by
Gymnosporangium Juniperi-virginianae Schw.

Ont.-

Only one or two cases found in the Niagara District; unimportant.

N.S.-

Generally of a minor nature, present to a lesser extent than last year.

FIRE BLIGHT, caused by
Bacillus amylovorus (Burr.) Trev.

B.C.- Coast and Kootenay -

The only new infections observed were in the neighbourhood of Cranbrook, E. Kootenay, where it was severe.

Okanagan and Salmon Arm -

Twig blight was serious in orchards neighbouring pear orchards where the disease was severe.

Man.-

Fairly general, but not severe. Apparently less than usual.

Ont.-

In the Niagara District as high as 50 to 70% of Tolman blossom spurs were destroyed. Baldwin and Spy are somewhat more susceptible than other varieties. On the average, with most varieties, about 20% of blossom spurs affected. However, the disease in this neighbourhood does not appear to have done more than destroy the fruit spurs.

In Ottawa and the vicinity the disease was prevalent and destructive.

In Renfrew County, 50% infections are reported. Specimens of this disease were also received from Aylmer and Sombra townships.

Que.-

Slight infections reported from Champlain, Matane, St.Lambert and L'Islet Counties.

P.E.I.-

Not observed.

ANTHRACNOSE, caused by
Neofabraea malicorticis (Cord.) Jack.

Three reports from British Columbia indicate the presence of this disease in the Salmon Arm District, Agassiz and on the coast, particularly in unsprayed orchards.

EUROPEAN CANKER, caused by Nectria galligena Bres.

This disease was not observed in the Niagara District or in Prince Edward Island, but in Nova Scotia it is reported as being associated with the green apple bug and having increased this year.

POWDERY MILDEW, caused by
Podosphaera leucotricha (E. et E.) Salm.

Two reports from British Columbia which indicate general infections, but not severe except in isolated places. Not severe enough, as a rule, to justify the expense of spraying.

SOOTY BLOTCH, caused by
Leptothyrium pomi (Mort. et Pr.) Sacc.

Generally of a minor nature in Nova Scotia and present even to a lesser extent than usual this year.

CANKER, caused by Nectria sp.

In British Columbia the cankers caused by this disease occurred on most of the trees that have suffered from winter injury.

SILVER LEAF, caused by Stereum purpureum Pers.

This apparently becomes more common each year in Man. Slight infections were found in Prince Edward Island.

"In British Columbia a silvery sheen on the foliage was present in many orchards. No fruiting bodies of the fungus were found. It is considered that this appearance is due chiefly to a certain type of root injury." (H. R. McLarty)

NON-PARASITIC DISEASES

BITTER PIT

Prevalent in practically all districts in the Okanagan and Salmon Arm section. In Nova Scotia it is generally of a minor nature and present even to a lesser extent this year than in previous years.

COLLAR ROT

During the past year, this disease has attracted a great deal of attention in British Columbia. In some orchards the loss was approximately 15% of the trees. It is considered that frost injury accounts for the major part of the damage. In only a few cases have the rhizomorphs of Armillaria mellea been present on decayed roots. (H. R. McLarty)

WINTER INJURY

In British Columbia a considerable amount of injury occurred in some orchards. This was most severe in

the Salmon Arm District, where heavy fall rains after a dry summer, prevented early maturing of the trees.

CORKY CORE

This was reported last year as Core Rot, the name having been changed on the suggestion of Dr. C. Brooks of the United States Department of Agriculture.

In British Columbia this disease was practically absent from the Salmon Arm District this year, but was present in many orchards scattered throughout the Okanagan. Losses sustained in some instances were 30 to 40% of the crop.

DROUGHT SPOT

General in all parts of British Columbia, particularly in orchards in light soil. The losses sustained this year were not as high as formerly.

APRICOT

SILVER LEAF (non-parasitic)

A silvered appearance to the foliage occurred in the Naramata District of British Columbia. The cause was considered to be a type of root injury.

BLACKBERRY

ORANGE RUST, caused by
Gymnoconia interstitialis (Schl.) Lag.

In the Niagara District this is the principal disease of the blackberry, and with many growers is the largest factor against the culture of this berry. It is wide-

spread and varies from 1 to 25%.

In Hull County, Quebec, and York and Sunbury Counties in New Brunswick, it is plentiful on wild blackberries from June 20 to July 15. A 100% infection in many roadside patches was common. None was found on cultivated varieties.

CHERRY

SHOT HOLE, caused by
Coccomyces hienalis Higgins.

In the Niagara District it was not destructive in sprayed orchards, but otherwise caused considerable July and August defoliation.

In Digby County, Nova Scotia, both sweet and sour cherries showed considerable infection and some slight defoliation.

BROWN ROT, caused by Sclerotinia cinerea (Bon.) Schr.

B.C.-

Present in the coastal area. Little on the fruit, but the blossom blight on Olivet cherries at Gordon Head seemed to have extended its area, while the severity was equal to that of last year, when 10 to 75% of the blossoms were destroyed. Infections were also reported from Agassiz and Balfour.

Man.-

Present to a limited extent on all sour cherry varieties at Morden.

Ont.-

Blossom blight was very bad in the Niagara District, some orchards showing 75% of the blossoms destroyed, while sprayed orchards on dry soil showed up to 10%. This loss, however, was not serious, owing to the abundance of blossoms. The disease was not troublesome during the rest of the season.

N.S.-

Somewhat more abundant than usual.

CURL, caused by Taphrina Cerasi (Fcl.) Sad.

In British Columbia it occurs at points in the Fraser Valley, but not in commercial orchards. At Summerland one tree at the Experimental Station was quite severely injured.

It was scarce in the Niagara District of Ontario.

POWDERY MILDEW, caused by
Podosphaera Oxyacanthae (Fr.) deB.

In British Columbia it was quite common on young trees, but the damage was not unusually severe. In the Niagara District, Ontario, it was practically absent.

BLACK KNOT, caused by
Plowrightia morbosa (Schw.) Sacc.

B.C.-

Specimens of this disease were brought in by Mr. W. Anderson from an orchard on the Indian Reserve at Point Grey. This is the second case reported on cultivated cherries or plums in British Columbia.

the other being at Kerrisdale, near Vancouver.

Man.-

Small amount present at Morden.

Que.-

Not common on cultivated varieties, but severe on wild cherries and plums.

P.E.I.-

Slight infections reported.

BLIGHT, caused by Coryneum Beijerinckii Oud.

At the University of Saskatchewan it was severe on the leaves of cultivated sand cherries.

BREAK DOWN (non-parasitic)

Cherries from the Okanagan, British Columbia, broke down badly in shipments. Examination of such cherries failed to show the presence of any one fungus. It is considered that the tissues were unusually weak, due to different climatic conditions that prevailed this season. (H. R. McLarty)

CURRENT

RUST, caused by
Cronartium ribicola F. de Wald.

See under WHITE PINE.

LEAF SPOTS, caused by
(Pseudopeziza Ribis Kleb.
(Mycosphaerella Grossulariae Lag.

B.C.-

Generally present from East Kootenay to the coast. Defoliation occurred in some cases, but usually of

little consequence. It is also present in the Salmon Arm District, but not causing serious damage.

Alta.-

Of common occurrence. Severe at Lacombe.

Sask.-

Common in northern Saskatchewan. Severe at Indian Head and Scott.

Man.-

In the south-west blacks and reds were heavily infected. A similar leaf spot (Mycosphaerella amea) was present on flowering currants, prematurely defoliating some of the bushes. In the south-east it was common, but not serious.

Ont.-

Present in the Thunder Bay District and Niagara Peninsula, but not doing any damage.

Que.-

One report of slight infection in Sherbrooke County.

N.B.-

Average infection of 10% found on red and black varieties in Westmoreland County.

N.S.-

Reported from Cumberland, Colchester, Pictou, Antigonish and Hants Counties.

P.E.I.-

Only moderate infection this year.

RUST, caused by Puccinia Pringsheimiana Kleb.

Reported from Deloraine, Morden and Winnipeg, Manitoba, also from the Niagara District, Ontario, but not serious.

POWDERY MILDEW, caused by
Sphaerotheca mors-uvae (Schw.) B. et C.

Present generally in British Columbia, in some cases the loss being great. Severe on black currants in Saskatchewan. Collected also at Lacombe, Alberta. In the Niagara District, Ontario, it was not observed this year.

CANE BLIGHT, caused by
Nectria cinnabarina (Tode) Fr.

This is reported from south-eastern Manitoba as being sometimes found on injured canes.

GOOSEBERRY

LEAF SPOTS, caused by Mycosphaerella Grossulariae Lag.
and Pseudopeziza Ribis Kleb.

B.C.-

Generally present from East Kootenay to the coast. Defoliation occurred in some cases, but usually of little consequence.

Sask.-

Quite severe at Scott. Defoliation of shrubs showing.

N.B.-

Average infection of 3% in patches examined in Westmoreland County.

N.S.-

A general infection reported from Colchester County.

P.E.I.-

Moderate infection, causing little injury.

RUST, caused by Puccinia Pringsheimiana Kleb.

- Man.- Did some damage at Morden.
- Que.- A slight infection reported from Kamouraska County.
- N.B.- Slight infection of aecial stage found on patches in Westmoreland County.
- N.S.- One specimen received from Kentville in June.

POWDERY MILDEW, caused by
Sphaerotheca mors-uvæ (Schw.) B. et C.

- B.C.- Severe on English varieties at the coast.
- N.B.- One patch in Westmoreland County had 75% of the plants affected, many plants showing 100% on the growing tips. Other patches which were interplanted with strawberries that received early applications of sulphur dust showed only 5% of plants with slight infections.
- N.S.- In Cumberland County infections ranging from 15 to 30% were reported.

GRAPE

BLACK ROT, caused by
Guignardia Bidwellii (Ell.) V. et R.

One report from the Niagara District, Ontario, indicates that it is general, but less injurious than usual owing to the fairly dry season.

DOWNY MILDEW, caused by
Plasmopara viticola (B. et C.) Berl. et de Toni

Unimportant in the Niagara District, only a few cases being observed.

POWDERY MILDEW, caused by Uncinula necator Schw.

Not as abundant as usual in the Niagara District.

DEAD ARM, caused by
Cryptosporella viticola (Red.) Shear.

Fairly general throughout the Niagara District. Heavy pruning is being successfully employed by growers as control. About 5% of the vines were affected in some patches.

PEACH

CURL, caused by Taphrina deformans (Fcl.) Tul.

B.C.-

Present in many orchards where no spray was applied, and the loss was severe in some cases.

Ont.-

In the Niagara District 50 to 80% infection occurred in unsprayed orchards. Spraying resulted in good control. The disease was general all over the peninsula on unsprayed trees; however, on the whole it was efficiently controlled.

At Harrow, it was observed in some orchards.

N.S.-

Slight infection in King's County.

POWDERY MILDEW, caused by Sphaerotheca pannosa (Wal.) Lev.

In British Columbia slight infections are common, but severe damage is not incurred. In the Niagara District infections are scarce and unimportant.

BROWN ROT, caused by Sclerotinia cinerea (Bon.) Schr.

Common in Ontario, but is of no great importance economically this year. This disease is usually not as severe on peaches as it is on cherries.

SCAB, caused by Cladosporium carpophilum Thüm

In the Niagara District it is common and causes reduction in marketable quality of some varieties, especially St. John, Elberta and Smock. This disease is apparently becoming more troublesome, and numerous growers are enquiring about methods for its control. Spraying for this disease has not usually been considered economical in this district. As a general rule peach trees receive only a dormant spray for leaf curl.

(Berkeley and Jackson)

NON-PARASITIC DISEASES

LITTLE PEACH

Very uncommon in the Niagara Peninsula; odd trees here and there were marked for eradication by provincial authorities. One orchard at Grimsby had about six such trees.

DROUGHT SPOT

In British Columbia a spotting of the fruit occurred in many orchards. Examination showed the absence of any fungus. The Provincial Entomologist stated that the injury was not due to insects. Examination of the root systems of affected trees showed extensive injury to the fibre roots. (H. R. McLarty)

PEAR

FIRE BLIGHT, caused by
Bacillus amylovorus (Burr.) Trev.

B.C.-

In general the infections were more severe than in 1922. In many orchards the losses were extremely heavy, and only by the most vigorous campaign of cutting was the disease kept at all in check. An unusually wet spring accounted, no doubt, for its increased severity. In a survey of the Creston District it was found in one orchard. This is a re-appearance of the disease in this district after being reported free for four years. (H. R. McLarty)

Ont.-

The pear crop was light, being chiefly due to fewer blossoms being present, but partly to the presence of blossom blight, with destruction of the fruit spurs. Pear orchards generally in the Niagara Peninsula appear to be holding their own well against the disease. However, in some orchards it has been exceptionally

severe this year, in many cases killing trees outright.

Que.-

In Kamouraska County, in a young orchard of about twenty trees, the four Clapp's Favourite were affected. One tree was entirely affected, the others only at the top, but the main stem ultimately died down to within one foot of the ground. (H. N. Racicot)

SCAB, caused by Venturia pyrina Aderh.

B.C.-

More than last year at the coast. Unsprayed Bartletts showed 75% infected fruits in certain cases. Unsprayed Flemish Beauty showed 100%. At Agassiz it was present to some extent this year, but not nearly as bad as in 1922.

Ont.-

In the Niagara District it was general throughout, but not enough to make it of economic importance. In Halton County quite heavy infection on Flemish Beauty is reported, with considerable damage incurred.

DROUGHT SPOT (non-parasitic)

An injury similar to the drought spot of apple has occurred in several orchards in southern Okanagan. The causes are considered to be the same as those in the apple. (H. R. McLarty)

PLUM

BROWN ROT, caused by Sclerotinia cinerea (Bon.) Schw.

B.C.-

Abundant and causing heavy loss in Agassiz and Mission. Grand Duke is apparently not so susceptible.

Man.-

The first report of this disease at the Agricultural College, Winnipeg, was in 1922, where there was considerable present. Three plums only were found in 1923. Mr. Leslie at the Morden Experimental Station writes that it is common there on hybrids with Sand cherry as a parent and on plums with considerable Prunus triflora blood. He finds the pure native plums to be immune. (Bisby and Bailey)

Ont.-

There was a bad attack in the Niagara District just after the fruit was set, due to a period of wet weather, but this only served to thin the set of plums, which was too heavy. Spraying prevented any further spread and the disease was not troublesome later. (Berkeley and Jackson)

Que.-

Not observed this year at Macdonald College even in orchards which showed considerable infection last year.

N.S.-

Some specimens were received from River John.

P.E.I.-

Not observed.

SHOT HOLE, caused by Coccomyces prunophorae Higgins.

- Sask.- Moderately severe at Scott.
- Man.- Occurs occasionally.
- Ont.- Common in unsprayed orchards in the Niagara District, several of which were observed to be losing their leaves late in July and August. Thorough spraying appears to be necessary. Early varieties were especially susceptible. (Berkeley and Jackson)
- Que.- In one orchard in Kamouraska County, two trees out of twenty were almost wholly defoliated. In Sherbrooke County there was a serious infection.
- P.E.I.- Not observed.

PLUM POCKETS, caused by
Taphrina Pruni (Fcl.) Tul.

- Sask.- A few specimens observed at Rosthern, Indian Head and Canora. Not observed elsewhere.
- Man.- Common and often serious. Controlled by dormant wash and pink bud Bordeaux at the Agricultural College, Winnipeg.
- Ont.- Specimens sent from Snake Creek and Cardinal. Fairly general and serious throughout the province.
- Que.- Severe infections reported from Hull, Sherbrooke, and

Champlain Counties.

N.S.- In King's County 5% infections noted.

BLACK KNOT, caused by
Plowrightia morbosa (Schw.) Sacc.

Man.- Common and often injurious.

Ont.- Scarce in the Niagara District, because of thorough spraying and pruning.

Que.- One report from Bonaventure County which indicates all trees badly affected, none of them being sprayed or pruned.

N.B.- Found generally on the majority of native plums and wild cherries. Many old trees are heavily infected.

N.S.- Heavy infections reported from King's and Colchester Counties.

SCAB, caused by Cladosporium carpophilum Thüm

Man.- Collected on cultivated plums at Brandon. It seriously affects the appearance of the fruit.

Que.- A shot hole disease was caused by this fungus at MacDonald College, the trees being 100% infected. The trees appeared quite brown at a distance and many branches of some of them were completely defoliated.

QUINCE

LEAF BLIGHT, caused by Fabraea maculata (Lev.) Atk.

In the Niagara District this disease is common and doing considerable damage where spraying is neglected.

RUST, caused by
Gymnosporangium germinale (Schw.) Kern.

Present in the Niagara District, but not of great importance. The number of quince trees grown is limited.

RASPBERRY

SPUR BLIGHT, caused by
Mycosphaerella rubina (Pk.) Jacz.

- Man.- This disease is not uncommon.
- Ont.- Its presence is noted generally, but it is apparently of little economic importance.
- Que.- Some damage was done by this fungus on Herberts' at Macdonald College.
- N.S.- More or less severe in garden patches in Colchester Co.

ANTHRACNOSE, caused by Gloeosporium venetum Speg.

- Ont.- Small infections in the Thunder Bay District. In the Niagara Peninsula it is scarce except on black raspberries and blackberries.
- Que.- Slight infections reported from L'Islet, Champlain and Matane Counties. At Macdonald College there was a 90%

infection of the Herberts.

N.B.-

An average infection of 25% on young canes at Fredericton in variety plots. Slight infection in commercial patches.

P.E.I.-

A small percentage found.

CANE BLIGHT, caused by
Leptosphaeria coniothyrium (Fckl.) Sacc.

Infections reported from Sherbrooke County, Quebec, and Colchester County, Nova Scotia.

CANE DISEASE, probably caused by
Acrostalagmus caulophagus Law.

In the Niagara District this year a cane disease has been prevalent. Plantations with infections as high as 10% have been observed. Three-quarters of the plantations show the presence of the cane disease. As yet it is not certain what proportion of this is due to cane blight (Leptosphaeria coniothyrium (Fckl.) Sacc.) and what percentage is due to blue stem (Acrostalagmus caulophagus Law.). Internal isolations from five different plantations have in most cases given blue stem cultures from red as well as black raspberries. Observations in the field also show that the bulk of this disease may be blue stem. In any case it is important to note that blue stem has been found this year on red raspberries. Last year it was reported on black raspberries only.

LEAF SPOT, caused by *Mycosphaerella Rubi* Roark.

Slight injury has been caused by this disease in Manitoba.

CROWN GALL, caused by *Bacillus tumefaciens* E.F.S.

B.C.-

It seems to be increasing in frequency on red raspberries. So far only reported from Vancouver Island and the Fraser Valley.

Ont.-

Fairly common, but of no great importance in the Niagara District. A specimen sent from Markham.

P.E.I.-

Observed affecting a few patches; not severe.

MOSAIC, cause unknown

B.C.-

A very severe case was found at Nelson, and it was noticed at points in the Fraser Valley. In most cases it does not seem to have appreciably affected the productivity of the plantations. In the Okanagan and Salmon Arm Districts it is noticed in practically all the plantations. Infection seems general, particularly in the Salmon Arm District, where there are plantations of considerable size.

Man.-

Common and rather serious.

Ont.-

Infection of 10% noted in Essex County. Serious in the Thunder Bay District and common on the wild raspberries.

This disease is general throughout the Niagara Peninsula, Lake Ontario and Milton Districts. Young plantations average about 10% and older plantations about 15 to 20%. Many of the worst patches have been removed because of being unprofitable, and certified stock is adding to the number of reasonably clean patches. Growers are becoming acquainted with the disease, and by doing their own roguing, and having started with good stock, are working out a practical control. Some growers report almost a normal crop from patches having a high percentage of disease, but unless highly fertilized, such patches are proving unprofitable. A few cases of rapid rate of spread were observed this year, but in general the spread of the disease does not appear to have been as great as in 1922.

Que.-

At Ste. Anne de la Pocatiere some plants were affected at the Experimental Station, less than 1%. An infection of medium intensity is reported from Sherbrooke.

N.B.-

Common on wild Rubus sp. Among cultivated varieties, St. Regis, Herbert and Eldorado were the only ones

found free from mosaic. Other varieties had from 1 to 50%, except Marlboro, which showed approximately 90%.

N.S.-

Of fairly general occurrence, but not doing much apparent damage.

P.E.I.-

Severe in some patches, while not present in others. It is spreading slowly.

LEAF CURL, cause unknown

Man.-

Sometimes found.

Ont.-

Causes considerable annual loss, from 1 to 5%, due to the removal of diseased plants. Continual roguing by the growers, however, is keeping the disease from becoming more serious. A certain amount reappears every year due to spread and to incomplete removal of the large root system of the rogued plants, but the disease is decidedly on the decrease.

Que.-

One report from Sherbrooke indicating a medium infection. Newman No.24 and King are apparently resistant.

N.B.-

Commonly found in patches of wild raspberries. Cultivated patches have very low percentage. Where found, the disease appears to have been present for several years, both in wild and cultivated patches.

N.S.- One report from Nappan Experimental Farm shows 15% infection in Herberts and 5% in Newmans.

P.E.I.- Severe in a few varieties, but generally not bad.

STRAWBERRY

LEAF SPOT, caused by
Mycosphaerella Fragariae (Schw.) Lin.

B.C.- About the usual amount present. A disease of little importance.

Alta.- Observed in various places in northern Alberta.

Sask.- Present at Saskatoon, Rosthern and Scott.

Man.- Common and causes some damage.

Ont.- Reported from Essex County, Thunder Bay and Niagara Districts as present in almost every patch, but apparently of not great economic importance.

Que.- Some damage from this disease is reported from L'Islet and Sherbrooke Counties. Valeria and Portia show some resistance.

N.B.- Average infection of 60%, but there was little defoliation and not much damage.

N.S.- Reports from Nappan and Kentville indicate slight infections. "In Annapolis County it was noticeable

on various patches. It is interesting to record that areas dusted or sprayed with Bordeaux for the control of strawberry weevil contained much less leaf spot than the patches not so treated, also, where sulphur compounds were used, control was noted, but not to the same extent as with the Bordeaux." (A. Kelsall)

P.E.I.-

A small percentage present.

LEAF SCORCH, caused by
Mollisia earliana (E. et E.) Sacc.

Ont.-

At Whitby a serious infection is reported. Not as prevalent as leaf spot in the Niagara District, being of no economic importance.

N.B.-

Slight infection up to 5% reported in Westmoreland Co.

POWDERY MILDEW, caused by
Sphaerotheca Humuli (DC.) Burr.

Ont.-

Especially severe in some plantations in the Niagara District, causing a curling and drying up of the leaves. One grower estimated a loss of one-third of his crop.

N.B.-

One patch of seven acres in Westmoreland County had 30% infection on foliage. Other patches in vicinity totaling seventy-five acres had practically no mildew. One severe infection reported in King's County, where a one-acre field of Sample variety had 90% foliage

infection and 50% fruit infection on both green and ripe fruit (August 4). The following estimates were made July 18 on the variety plots at the Experimental Farm, Fredericton:

Americans	100%	Warfield	10%
Beans	100%	Glen Mary	5%
President	80%	New York	5%
Sample	75%	Buback	3%
Williams Improved	75%	Brandywine	2%
Parson's Beauty	60%	Charles 1	2%
Betty Sunday	50%	Jersey Giant	slight
Ozark	25%	Julia	slight
Senator Dunlap	25%	Bewasteco	slight
K. Prize	25%	Vovania, Ohelio, Viola,	
Black Beauty	15%	Portia, K.Premier, Splendid	
Cordelia	10%		0%
Bederwood	10%		

N.S. -

One report from Kentville indicates a severe infection on the variety President, with a trace on others.

P.E.I.-

Average infection of 6%.

FRUIT ROTS, caused by Botrytis and Rhizopus spp.

Man.-

Present to about the usual extent.

N.B.-

Average report of 4% infection on fruit during first week in August. Later pickings developed up to 15% fruit infections.

N.S.-

One report from W. L. Blair, Kentville, N.S., stated that considerable rot was noticed on heavily fertilized beds where foliage was dense. Location and variety seemed to bear little relation to prevalence of disease in such patches.

ROOT ROT, cause unknown

N.B.-

In a survey of several patches of strawberries in Queens, Kings and Westmoreland Counties, the following percentage infections are recorded:

Senator Dunlap	$\frac{1}{4}$ acre	2 yr.	15%
" "	2 acres	3 yrs.	50%
" "	1 acre	2 yrs.	50%
" "	1 "	1 yr.	2%
Sample	$\frac{1}{4}$ "	3 yrs.	75%
" "	2 acres	2 "	2%
Senator Dunlap	40 "	1-3 "	8%
" "	50 "	1-3 "	2%

The disease is more or less localized in the Grand Lake District and at Fredericton on the variety plots. The disease appears to be of bacterial origin.

P.E.I.-

Found to the extent of 5% in some patches.

VEGETABLE AND FIELD CROP DISEASES

ASPARAGUS

RUST, caused by Puccinia Asparagi DC.

In Manitoba this disease was observed, but no damage noted. In Prince Edward Island it has not yet been observed.

RUSTY TIPS, cause unknown

A trouble apparently similar to that noted in the East, in the last annual report, under this name, was observed on Vancouver Island.

BEAN

ANTHRACNOSE, caused by
Colletotrichum Lindemuthianum (Sacc. et Magn.) Br. et Cav.

Alta.-

Present, but not very prevalent.

Sask.-

Collections made at Saskatoon, Rosthern and Indian Head.

Man.-

Trace found at Morden. At Brandon it was more destructive than bacterial blight. Challenge Black Wax was apparently heavily infected in 1922 and showed 100% of the plants affected. After one rain the infection on this variety increased to 75% of the pods. All varieties showed more or less of the disease except Canadian Wonder.

Ont.-

One report from Halton County, where there was a

heavy infection.

Que.-

Moderate infections reported from Sherbrooke County, Missisquoi County and Macdonald College, Hodson Long Pod, Stringless Green Pod and Refugee showing some resistance.

N.B.-

Not of much importance except in a few localities, and there only to a small extent.

N.S.-

In Annapolis County it was less prevalent than usual. At Nappan Experimental Farm the following infections of varieties were noted:

Stringless Green Pod	30%	Wardwell's Kidney Wax	30%
Round Pod Kidney Wax	30%	Ex.Early Red Valentine	25%
Plentiful Fruit	75%	" " Round "	15%

P.E.I.-

Severe infections in certain localities.

BACTERIAL BLIGHT, caused by Bacterium Phaseoli E.F.S.

Alta.-

Prevalent in the irrigated districts of Lethbridge, Vauxhall and Brooks.

Sask.-

Present in northern Saskatchewan, but not severe.

Man.-

In the south-east it was common and somewhat injurious. In the south-west it caused a loss of 5-10% of the surface. Many of the pods were also infected, principally along the suture and through insect punctures, although stomatal infection also occurred, but to a more limited

extent. This disease is evidently not spread by rain to the same extent as anthracnose.

Que.-

At Farnham, 25% of the plants in six plots were affected. At Macdonald College this disease was not as serious as anthracnose, but caused a good deal of damage.

N.S.-

A number of farmers' gardens showed infections ranging from moderate to severe.

P.E.I.-

Two reports indicate local infections ranging from 50% to 100% loss.

RUST, caused by Uromyces appendiculatus (Pers.) Lev.

N.S.-

Appeared late in the season and was fairly abundant on pole beans.

P.E.I.-

Severe infections noted in a few instances.

WILT, caused by Sclerotinia libertiana Fckl.

Moderate infection of about 10% noted in variety plots at Fredericton, N.B.

RHIZOCTONIA, caused by
Corticium vagum B. et C.

In the district of Raymond, Alta., this disease affected many bean crops. In some cases the loss would be as high as 10%. It was also observed at Vauxhall, Alta., on July 28.

MOSAIC, cause unknown

- Man.- Slight infection at Morden.
- Ont.- In Essex Co., 25% of the plants in several small plots were affected. In the Niagara District it was common, some plots showing a high percentage.
- Que.- Present to a small extent in Champlain Co.
- P.E.I.- Not observed.

BEEET

LEAF SPOT, caused by Cereospora beticola Sacc.

- Man.- Occasional infections, but no damage.
- Ont.- One report indicating its presence in the Thunder Bay District, not causing much damage.
- Que.- General in Sherbrooke Co., but not serious.
- N.S.- General in garden plots in Kings, Digby and Colchester Counties, but injury very slight.
- P.E.I.- Slight infections.

SCAB, caused by
Actinomyces scabies (Thax.) Güssow

A few isolated cases reported from Rimouski Co., Que.
Fairly common in Ontario.

ROT, caused by Phoma Betae Fr.

This disease did some damage on Lulu Island and at Duncans, B.C. Phoma Betae was isolated in both cases, but there was evidence that a considerable amount of dry rot could exist without any fungus being found, cultures from the tissue remaining sterile. The season at the places mentioned was exceptionally dry. (J.W. Eastham)

CABBAGE

CLUB ROOT, caused by
Plasmodiophora Brassicae Wor.

Que.-

Two reports from Champlain Co. indicate its presence to a moderate extent.

N.B.-

Very little reported.

N.S.-

At Nappan Experimental Farm Extra Amager Danish Ball-head was 6% infected.

SOFT ROT, caused by Bacillus carotovorus Jones

B.C.-

After a wet period in July, soft rot occurred in practically all cabbage gardens from Kelowna south. The damage was quite severe on the outer leaves. Dry weather following this period checked the advance of the disease.

Man.-

Moderate damage occurred from this disease.

CAULIFLOWER

SOFT ROT, caused by Bacillus carotovorus Jones

One report from Manitoba, where this disease was found causing moderate damage.

CELERY

LATE BLIGHT, caused by
Septoria Petroselini Desm. var. Apii Br. et Cav.

Ont.-

In Frontenac County it reduced the value of the crop by 50%, Paris Golden being more severely attacked than the other varieties. One farm near Toronto had a 40% infection with considerable damage. In Peterborough County and the Thunder Bay District infections were also noted doing some damage.

Que.-

Present at Macdonald College and in Sherbrooke County, but not as common as last year. Paris Golden was found to be more susceptible than Easy Blanching.

EARLY BLIGHT, caused by Cercospora Apii Fr.

One report of a slight infection at Macdonald College in September.

SOFT ROT, caused by Bacillus carotovorus Jones

B.C.-

At Summerland some damage was caused, and was occasionally present at Agassiz.

Man.-

Moderate damage incurred.

CUCUMBER

WILT, caused by Bacillus tracheiphilus E.F.S.

One report from a greenhouse in Essex Co., Ont., where there was a moderate infection.

MOSAIC, cause unknown

Man.-

This was first found this year, causing much loss, in the trucking area north of Winnipeg.

Ont.-

Present in Frontenac Co.

P.E.I.-

A small amount on one variety.

HORSE RADISH

LEAF SPOT, caused by
Cercospora Armoraciae Sacc.

One garden badly diseased at Lacombe, Alta.

LETTUCE

DROP, caused by Sclerotinia libertiana Fckl.

One report from Prince Edward Island, where a 75% infection was noted in two fields.

MILDEW, caused by Bremia Lactucaae Regel.

Caused trouble in a number of greenhouses in Ontario.

BACTERIAL SOFT ROT, caused by Pseudomonas sp.

One report of a 20% loss in Essex Co. in a plot containing about six hundred heads.

MANGEL

CROWN GALL, caused by Bacillus tumefaciens E.F.S.
A specimen of this disease was sent to the Central
Laboratory from Apopagui, N.B.

SOFT ROT, caused by Bacillus carotovorus Jones
This disease caused considerable damage in the Sum-
merland District, B.C.

DISEASES OF DOUBTFUL ORIGIN

"Wherever the soil is lacking in humus and consequently
low in water and nitrogen content, a disease resembling
that caused by Phoma Betae (Ond.) Frank, was found
attacking mangels to a considerable extent both in
Vancouver Island and the Okanagan. It is decidedly
less common in the Fraser River delta." (P.A. Boving, B.C.)

"A disease of seedling mangels, apparently identical
with that described by Sorauer (Eng. Ed. pages 226 et
seq.) under the name of 'root blight' was observed on
Lulu Island. It is noteworthy that it was most marked
when, owing to weather or labour conditions, the soil
had been allowed to bake or form a hard crust around
the young plants". (J.W. Eastham, B.C.)

MELON

Three diseases are reported, viz.; wilt, caused by
Bacillus tracheiphilus E.F.S. affected about 1.5%
of the plants at the Experimental Station, Morden, Man.;
leaf spot, caused by Alternaria Brassicae (Berk.) Sacc.,

caused considerable damage to two or three patches in the Niagara Peninsula; and the downy mildew, caused by Pseudoperonospora cubensis (B. et C.) Rostoro, which did some damage to frame grown plants in Morden, Man.

ONION

SMUT, caused by Urocystis Cepulae Frost.

Ont.-

It has been found in Mersea and Leamington townships, Essex County.

Que.-

In several districts around Montreal this disease was so serious that some of the fields had to be ploughed under.

Man.-

It has been found in some truck gardens in the vicinity of Winnipeg.

DOWNY MILDEW, caused by
Peronospora Schleideni Ung.

Reported from Agassiz, B.C., and a 10% infection in P.E.I.

PEA

SPOTS, caused by Mycosphaerella pinnodes
Berk. et Blox. and Septoria Pisi West.

Sask.-

Quite common in northern Saskatchewan, a severe infection being found at Scott.

Man.-

Present to a moderate extent in truck gardens.

N.S.-

Infections were general in some gardens in Pictou and Colchester Counties.

MILDEW, caused by Erysiphe Polygoni DC.

Man.-

Slight damage at Morden.

Que.-

General, but not serious in Sherbrooke County.

P.E.I.-

A mild infection.

RUST, caused by Uromyces Pisi (Pers.) Wint.

A moderate infection, late in the season, was reported from Manitoba.

ANTHRACNOSE, caused by Colletotrichum Pisi Pat.

In south-western Manitoba it was epidemic, causing a premature drying of the plants with considerable reduction in yield. This disease has been reported from Wisconsin only. (I.L. Conners)

MOSAIC, cause unknown

Slight infection in Essex Co., Ont. At Macdonald College, Que., it was pronounced in field plots of Golden Vine, Canadian Beauty, Prussian Blue and Chancellor.

ROOT ROT AND BLIGHT, caused by
Fusarium and Pythium spp.

This disease is reported from Prince Edward and Hastings Counties, Ont., again this year. The amount of infection this year is not quite as extensive as it was last year, as more care was taken in selecting fields which had either not grown peas recently or had not shown any previous symptoms of the trouble.

(R.E. Stone)

In Hastings Co., in a garden plot, 80% of the Little Marble variety were diseased. The Horsfood Improved and Telephone varieties growing alongside were apparently resistant. (G.C. Chamberlain)

In Essex Co. a Fusarium wilt infection was observed causing a 50% loss in one plot and a total loss in two others.

PEPPER

BLOSSOM END ROT, cause unknown

In Manitoba, this disease is common and with some varieties very serious.

POTATO

SEED CERTIFICATION

The following summaries of field inspections of potatoes have been supplied by G. Partridge, Chief Inspector, and C. Tice, Vegetable Specialist for British Columbia. They indicate the acreages inspected and passed for certification; the average percentage of disease in inspected, passed and rejected fields; also the number of fields rejected for each disease or other cause of rejection.

These summaries are followed by provincial summaries in which the same information is given for the individual provinces. This information gives some indication of the prevailing diseases in each province, and together

with the reports from the collaborators on each disease, form a fairly complete survey of the potato diseases which are found in Canada.

FIELD INSPECTION OF POTATOES, 1923.

SUMMARY OF ALL PROVINCES EXCEPT BRITISH COLUMBIA

<u>No. applications received</u>	<u>No. fields inspected</u>	<u>No. acres inspected</u>	<u>No. fields passed</u>	<u>No. acres passed</u>	<u>Per cent of fields passed</u>	<u>Per cent of acres passed</u>
1297	2914	9681	2061	7099½	70.7	73.3
		<u>Black leg</u>	<u>Leaf roll</u>	<u>Mosaic</u>	<u>Wilts</u>	
Average per cent disease in total fields inspected		.62	.81	2.25	.14	
Average per cent disease in fields passed		.36	.42	.62	.064	
Average per cent disease in fields rejected		1.2	1.3	4.3	.27	

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Reasons for rejection of fields:

Black leg	72	fields	
Leaf roll	75	"	
Mosaic	440	"	Total fields rejected - 853
Wilts	14	"	
Foreign varieties	158	"	
Proximity to diseased fields	26	"	Total acreage rejected - 2581¾
Lack of vigour	43	"	
Lack of cultivation	1	"	
Insect injury	13	"	
Frost injury	8	"	
Hail injury	1	"	
Mosaic and Wilts	1	"	
Rhizoctonia	7	"	
Failure of crop	2	"	
Withdrawn by grower	2	"	
Not accepted for various reasons (chiefly climatic conditions)	9	"	

SUMMARY FOR BRITISH COLUMBIA

<u>Variety</u>	<u>Fields</u>	<u>Ac.</u>	<u>Leaf Roll</u>	<u>Mosaic</u>	<u>Black Leg</u>	<u>Wilt</u>	<u>Impurities</u>
Irish Cobbler	15	7.00	.08	1.83	-	-	.23
Early Rose	17	7.45	.13	1.05	.12	.05	.11
Sutton's Reliance	1	.25	-	-	1.25	-	-
Early Surprise	1	.10	-	1.25	-	-	.25
Jones' White	1	.25	-	-	-	-	-
Wee McGregor	4	3.45	.07	.12	.42	-	-
Jersey Royal	11	9.60	.10	1.55	.12	-	.11
Burbank	19	9.40	.04	3.50	.01	-	.02
Early St. George	16	9.10	.10	1.16	.32	-	.11
Netted Gem	77	74.75	.15	.75	.18	.03	.17
Up-to-date	4	3.75	.20	.50	-	-	-
Green Mountain	41	26.40	.13	1.52	.25	.01	.03
Eureka	1	.25	-	-	-	-	1.75
Beauty of Hebron	1	.25	-	-	-	-	.50
Early Ohio	7	2.65	-	3.07	.40	.20	-
Gold Coin	11	6.60	.41	.53	.27	.06	.05
Sir W. Raleigh	18	15.15	.10	.86	-	.07	-
Houlton Rose	1	.05	2.77	-	-	-	-
Early Bovee	1	.05	-	-	-	-	-
Early Six Weeks	1	.50	.25	2.75	-	-	-
	<u>248</u>	<u>177.00</u>					

Average percentage of diseases for all districts
(Uncertified)

<u>District</u>	<u>Fields</u>	<u>Ac.</u>	<u>Leaf Roll</u>	<u>Mosaic</u>	<u>Black Leg</u>	<u>Wilt</u>	<u>Impurities</u>
Sea Island	1	4	.50	1.25	.25	1.50	.75
Mt. Lehman	1	1	-	4.00	1.00	-	75.00
Chilliwack	7	-	.13	-	2.00	17.75	.75
Ladner	6	20	-	5.25	.37	.46	3.71
Pitt Meadows	4	6	-	1.62	.37	.44	1.06
Essondale	1	5	24.00	2.00	.25	.75	12.50
Surrey	3	5	-	4.30	-	-	2.00
Malakwa	2	2	-	-	-	-	-
Kelowna	1	1.5	2.00	5.00	-	.50	-
Vernon	1	1	-	30.00	3.00	1.00	-
Shawnigan	2	3.00	-	94.00	-	-	3.00
Errington	1	2.00	10.5	80.00	-	-	8.00
Alberni	6	12.00	.47	1.40	1.03	-	1.83
Courtenay	5	1.50	-	2.50	-	-	-
Gordon Head	5	3.50	.72	48.58	.33	-	.20
Sooke	1	1.00	.50	-	-	9.00	5.50
Metchosin	2	1.00	-	50.50	-	-	-
Keatings	4	3.00	.25	10.10	-	-	-
Ngassiz	4	6.50	-	15.00	-	-	-
	<u>57</u>	<u>79</u>	<u>2.05</u>	<u>18.71</u>	<u>.45</u>	<u>1.65</u>	<u>6.03</u>

FIELD INSPECTION OF POTATOES, 1923

ALBERTA

<u>No. fields inspected</u>	<u>No. acres inspected</u>	<u>No. fields passed</u>	<u>No. acres passed</u>	<u>Per cent of fields passed</u>	<u>Per cent acres passed</u>
151	354	107	174 $\frac{3}{4}$	70.9	49.4
		<u>Black leg</u>	<u>Leaf roll</u>	<u>Mosaic</u>	<u>Wilts</u>
Average per cent disease in total fields inspected		1.5	.2	1.2	.004
Average per cent disease in fields passed		.5	.1	.8	.005
Average per cent disease in fields rejected		3.9	.3	2.3	0.0

Reasons for rejection of fields:

Black leg	21	fields
Leaf roll	1	"
Mosaic	10	"
Presence of foreign varieties	5	"
Wilts	1	"
Rhizoctonia	4	"
Lack of vigour	<u>2</u>	"
Total	<u>44</u>	"

Total fields rejected, 44: Total acreage rejected, 179 $\frac{1}{4}$.

FIELD INSPECTION OF POTATOES, 1923

SASKATCHEWAN

<u>No. fields inspected</u>	<u>No. acres inspected</u>	<u>No. fields passed</u>	<u>No. acres passed</u>	<u>Per cent of fields passed</u>	<u>Per cent of acres passed</u>
108	446 $\frac{1}{2}$	78	242 $\frac{3}{4}$	72.2	54.6
		<u>Black leg</u>	<u>Leaf roll</u>	<u>Mosaic</u>	<u>Wilts</u>
Average per cent disease in total fields inspected		.7	.2	.9	0.0
Average per cent disease in fields passed		.5	.1	.01	0.0
Average per cent disease in fields rejected		1.3	.4	3.3	0.0

Reasons for rejection of fields:

Black leg	8	fields
Leaf roll	1	"
Mosaic	11	"
Presence of foreign varieties	7	"
Lack of vigour	<u>3</u>	"
Total	<u>30</u>	"

Total fields rejected, 30: Total acreage rejected, 203 $\frac{1}{2}$.

FIELD INSPECTION OF POTATOES, 1923.

MANITOBA

<u>No. fields inspected</u>	<u>No. acres inspected</u>	<u>No. fields passed</u>	<u>No. acres passed</u>	<u>Per cent of fields passed</u>	<u>Per cent of acres passed</u>
102	391	74	267	72.5	68.2
		<u>Black leg</u>	<u>Leaf roll</u>	<u>Mosaic</u>	<u>Wilts</u>
Average per cent disease in total fields inspected		.37	1.5	1.1	1.0
Average per cent disease in fields passed		.2	.98	.8	.4
Average per cent disease in fields rejected		1.08	1.9	1.6	2.2

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Reasons for rejection of fields:

Black leg	3	fields
Leaf roll	16	"
Mosaic	4	"
Wilts	4	"
Presence of foreign varieties	1	"
	—	
Total	<u>28</u>	"

Total fields rejected, 28: Total acreage rejected, 124.

FIELD INSPECTION OF POTATOES, 1923.

NORTHERN ONTARIO

<u>No. fields inspected</u>	<u>No. acres inspected</u>	<u>No. fields passed</u>	<u>No. acres passed</u>	<u>Per cent of fields passed</u>	<u>Per cent of acres passed</u>
162	200½	100	149¾	61.7	74.7
		<u>Black leg</u>	<u>Leaf roll</u>	<u>Mosaic</u>	<u>Wilts</u>
Average per cent disease in total fields inspected		.9	1.0	2.6	.09
Average per cent disease in fields passed		.4	.9	1.5	.07
Average per cent disease in fields rejected		1.4	1.6	3.0	.1

Reasons for rejection of fields:

Black leg	7	fields
Wilt	1	"
Leaf roll	4	"
Presence of foreign varieties	13	"
Mosaic	2	"
Lack of vigour	17	"
Frost injury	4	"
Hail injury	1	"
Rhizoctonia	2	"
Failure of crop	2	"
Not recommended for various reasons (chiefly climatic conditions)	9	"
Total	<u>62</u>	"

Total fields rejected, 62:
 Total acreage rejected, 50½

FIELD INSPECTION OF POTATOES, 1923.

SOUTHERN ONTARIO

<u>No. fields inspected</u>	<u>No. acres inspected</u>	<u>No. fields passed</u>	<u>No. acres passed</u>	<u>Per cent of fields passed</u>	<u>Per cent of acres passed</u>
142	308 $\frac{1}{4}$	71	195 $\frac{3}{4}$	50.0	63.5
		<u>Black leg</u>	<u>Leaf roll</u>	<u>Mosaic</u>	<u>Wilts</u>
Average per cent disease in total fields inspected		.31	3.9	2.6	.07
Average per cent disease in fields passed		.2	1.3	.9	.03
Average per cent disease in fields rejected		.4	4.9	3.9	.006

Reasons for rejection of fields:

Leaf roll	40	fields
Mosaic	9	"
Lack of vigour	4	"
Presence of foreign varieties	14	"
Rhizoctonia	1	"
Withdrawn by growers	<u>2</u>	"
Total	<u>71</u>	"

Total fields rejected, 71; Total acreage rejected, 112 $\frac{1}{2}$.

FIELD INSPECTION OF POTATOES, 1923

QUEBEC

<u>No. fields inspected</u>	<u>No. acres inspected</u>	<u>No. fields passed</u>	<u>No. acres passed</u>	<u>Per cent of fields passed</u>	<u>Per cent of acres passed</u>
417	959½	268	573¼	64.3	59.7
		<u>Black leg</u>	<u>Leaf roll</u>	<u>Mosaic</u>	<u>Wilts</u>
Average per cent disease in total fields inspected		.44	.38	5.8	.006
Average per cent disease in fields passed		.3	.35	.85	.008
Average per cent disease in fields rejected		.7	.45	15.1	.004

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Reasons for rejection of fields:

Black leg	5	fields
Leaf roll	3	"
Mosaic	113	"
Presence of foreign varieties	24	"
Frost injury	<u>4</u>	"
Total	<u>149</u>	"

Total fields rejected, 149: Total acreage rejected, 386¼

FIELD INSPECTION OF POTATOES, 1923.

NEW BRUNSWICK

<u>No. fields inspected</u>	<u>No. acres inspected</u>	<u>No. fields passed</u>	<u>No. acres passed</u>	<u>Per cent of fields passed</u>	<u>Per cent of acres passed</u>
837	3475 $\frac{1}{4}$	485	2223 $\frac{1}{4}$	57.9	64.0

	<u>Black leg</u>	<u>Leaf roll</u>	<u>Mosaic</u>	<u>Wilts</u>
Average per cent disease in total fields inspected	.54	.15	4.5	.06
Average per cent disease in fields passed	.28	.09	.65	.03
Average per cent disease in fields rejected	.9	.23	9.9	.09

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Reasons for rejection of fields:

Black leg	13	fields
Leaf roll	4	"
Mosaic	23	"
Wilts	7	"
Presence of foreign varieties	52	"
Lack of vigour	10	"
Insect injury	9	"
Too close proximity to diseased fields	23	"
Total	352	"

Total fields rejected: 352; Total acreage rejected: 1252.

FIELD INSPECTION OF POTATOES, 1923.

NOVA SCOTIA

Varieties other than
Garnet Chili

<u>No. fields inspected</u>	<u>No. acres inspected</u>	<u>No. fields passed</u>	<u>No. acres passed</u>	<u>Per cent fields passed</u>		<u>Per cent acres passed</u>
90	178 $\frac{3}{4}$	54	86 $\frac{1}{2}$	60.0		48.4
		<u>Black leg</u>	<u>Leaf roll</u>	<u>Mosaic</u>	<u>Wilts</u>	
Average per cent disease in total fields inspected		.17	.25	2.9	.18	
Average per cent disease in fields passed		.07	.16	.28	.07	
Average per cent disease in fields rejected		.3	.4	6.5	.02	

Reasons for rejection of fields:

Black leg	2	fields
Leaf roll	2	"
Mosaic	28	"
Mosaic and Wilts	1	"
Lack of vigour	1	"
Presence of foreign varieties	<u>2</u>	"
Total	<u>36</u>	"

FIELD INSPECTION OF POTATOES, 1923.

NOVA SCOTIA

Garnet Chili

<u>No. fields inspected</u>	<u>No. acres inspected</u>	<u>No. fields passed</u>	<u>No. acres passed</u>	<u>Per cent fields passed</u>	<u>Per cent acres passed</u>
80	154 $\frac{3}{4}$	70	137 $\frac{1}{2}$	87.5	88.8

	<u>Black leg</u>	<u>Leaf roll</u>	<u>Mosaic</u>	<u>Wilts</u>
Average per cent disease in total fields inspected	.6	.5	.1	0
Average per cent disease in fields passed	.5	.2	0	0
Average per cent disease in fields rejected	.6	2.8	.1	0

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Reasons for rejection of fields:

Black leg	1 field
Leaf roll	4 "
Presence of foreign varieties	2 "
Proximity to diseased fields	3 "
Total	<u>10</u> "

FIELD INSPECTION OF POTATOES, 1923

PRINCE EDWARD ISLAND

<u>No. fields inspected</u>	<u>No. acres inspected</u>	<u>No. fields passed</u>	<u>No. acres passed</u>	<u>Per cent of fields passed</u>			<u>Per cent of acres passed</u>
825	3212 $\frac{3}{4}$	754	3048 $\frac{3}{4}$	91.4			94.9
				<u>Black leg</u>	<u>Leaf roll</u>	<u>Mosaic</u>	<u>Wilts</u>
Average per cent disease in total fields inspected				.7	.02	.82	.05
Average per cent disease in fields passed				.7	.02	.4	.03
Average per cent disease in fields rejected				1.6	.004	5.2	.25

Reasons for rejection of fields:

Black leg	12	fields
Mosaic	29	"
Wilts	1	"
Presence of foreign varieties	18	"
Lack of vigour	6	"
Lack of cultivation	1	"
Insect injury	<u>4</u>	"
Total	<u>71</u>	"

Total fields rejected; 71: total acreage rejected; 164.

LATE BLIGHT, caused by
Phytophthora infestans de Bary

- B.C.- This disease is not troublesome at Point Grey, and experiments show no results in favour of spraying, although it is required in low lying districts of the Fraser Valley. At Agassiz it was scarce this year, although bad in 1921 and 1922.
- Alta.- Not observed.
- Sask.- Not observed.
- Ont.- Rather less than usual in most parts of the province, but bad at the Central Experimental Farm, Ottawa, causing a loss of about 20% of the harvested crop of Green Mountains and 1% on Irish Cobblers.
- Que.- Serious throughout the Sherbrooke District. At Macdonald College, it did not appear until September 23rd, and was too late to influence the yield.
- N.S.- In the counties of Hants and Colchester, serious infections occurred, causing losses ranging from 6% to 30% of the crop. In Annapolis County it was much less prevalent than usual, appearing for the most part late in the season, and causing little damage. There is much less rot in storage than usual.

EARLY BLIGHT, caused by
Alternaria Solani (E. et M.) J. et G.

B.C.-

Not of any importance at Agassiz.

Alta. and Sask.-

It was severe and general throughout northern Saskatchewan and northern Alberta, causing considerable reduction in yield. It was the most severe attack ever noticed in these provinces.

Man.-

Common, but the injury was not serious. It nevertheless paid to spray with Bordeaux mixture.

Ont.-

One report from Essex County, in which a 100% infection was noted in one field, slight to moderate in four others.

Que.-

Observed in all fields at Macdonald College to a moderate extent. Traces in Matane and Bonaventure Counties.

N.S.-

Did not appear until late in the season, and then causing little damage.

WILT, caused by Fusarium oxysporum Schl.

Reported only from Manitoba, where this disease affected an average of 1.5% of the plants at Morden. The field inspections, however, also show the presence of this disease in British Columbia, Alberta, Ontario, Quebec, New Brunswick, Nova Scotia and Prince Edward Island.

RHIZOCTONIA, caused by
Corticium vagum Solani B. et C.

- B.C.-
Widespread, but of varying severity.
- Alta. and Sask.-
Very common as usual.
- Man.-
Somewhat less abundant than usual. At Morden, 45% of the plants were affected, although not as severe as usual. A percentage of 5.6 of the tubers were affected.
- Que.-
A trace reported from Matane and Rimouski Counties.
- SCAB, caused by Actinomyces scabies (Thax.) Güssow
- B.C.-
Very prevalent throughout the province, particularly on land rented by the Chinese and planted to potatoes year after year.
- Alta.-
Present to a limited extent at Beaverlodge.
- Man.-
Common: a heavy infection developed on treated seed on virgin soil just cleared at Winnipeg. Seed treatment gives fair results unless the soil is too heavily infected. Sulphur applications to the soil lessened the attack but was scarcely practicable.
- (Bisby and Bailey)
- Que.-
In Sherbrooke County it was quite prevalent.
- N.S.-
At Nappan there was a slight infection.

BLACK LEG, caused by Bacillus solanisaprus Har.

- B.C.- One field in Summerland found to be badly affected.
- Man.- Not much found except in one instance, where there was 20%.
- Que.- Severe attacks found in Rimouski, Matane, Bonaventure and Champlain Counties; infections varying from 4 to 25%.
- N.S.- In Colchester and King's Counties an average of 5% of this disease was found. At Nappan Irish Cobblers showed 1.5% and Davis Warrior 2.5%.

DISEASES OF UNKNOWN ORIGIN

TIP BURN

- Man.- Common and causing some reduction in yield.
- Que.- Present at Macdonald College, but in most cases obscured by the greater injury caused by aphids,

LEAF ROLL

- Man.- It continues to be one of the commonest and most insidious potato diseases.
- Que.- In Rimouski, Matane and Bonaventure Counties the disease is common, with infections ranging from 1 to 6%.
- N.S.- At Nappan the following percentage infections were

noted among the varieties grown:

Edzell Blue	100%	Barnhouse Beauty	100%
Majestic	60%	King George	80%
Kerr's Pink	25%	King Edward	8%
British Queen	8%	Irish Cobbler	2%
Green Mountain	0		

MOSAIC

B.C.-

Prevalent in all districts.

Man.-

Fairly common. The symptoms are likely to be masked.

Ont.-

One report from Essex County, where there was an average of 10% of the hills affected.

Que.-

Serious in Sherbrooke, Rimouski, Matane, Bonaventure and Champlain Counties.

N.S.-

At Nappan infections by varieties were as follows:

Mills Pride)	Carman No.1	8%
Green Mountain)	Empire State	40%
Garnet Chili) 100%	Valley Success	20%
White Rose)	Early Six Weeks	30%
Great Scott	36%	Irish Cobbler	20%
		Prairie Flower	35%

The following were free from the disease:

King Edward	Majestic
Edzell Blue	Beauty of Hebron
Barnhouse Beauty	Factor
King George	

NET NECROSIS

Not as common this year as last in Manitoba.

CURLY DWARF

At Morden, Man., occasional plants were affected. In Bonaventure Co., Que., about 2% was present in one field

which had 20% mosaic and resembled plants with severe mosaic.

SPINDLE TUBER

Spindle tuber as described by Shultz and Folsom (J.A.R. 25, 2) has been found in one or two strains of Irish Cobblers. An effort is being made to rid New Brunswick of these strains by selling the crops as table stock. This disease is of major importance to seed buyers from the United States, hence the necessity of cleaning out strains of seed which now show any appreciable extent of spindle tuber. Our Green Mountain strains appear to be practically free from the disease. (Hockey and Richardson)

STREAK

In New Brunswick this was found on a few plants of the Spaulding Rose and Beauty of Hebron varieties.

RHUBARB

LEAF SPOT, caused by Ascochyta Rhei E. et E.

This was present to a considerable extent at Macdonald College, Que.

LEAF SPOT, caused by
Phyllosticta straminella Bres.

Caused some damage in south-western Manitoba.

ANTHRACNOSE, caused by
Colletotrichum erumpens Sacc.

Considerable petiole infection at Macdonald College, Que.

CROWN ROT, cause unknown

B.C.-

A severe crown rot occurred at the Experimental Station, Summerland. The cause was not determined.

Man.-

In the disease found at Brandon, the whole plant is badly stunted; the leaves are not more than one-quarter of the normal size and are usually red or faded. The stems rot at their bases. It was doing considerable damage.

SPINACH

MILDEW, caused by
Peronospora effusa (Grev.) Rab.

Found at the Experimental Farm, Charlottetown, P.E.I., in one patch to the extent of 80%.

ANTHRACNOSE, caused by
Colletotrichum Spinaciae E. et H.

At Macdonald College, Que., the second crop of spinach was so heavily infected with this disease that it was unfit for use and ploughed under.

TOBACCO

ROOT ROT, caused by
Thielavia basicola (B. et Br.) Zopf.

In Ontario the effects of this disease were most noticeable towards the end of the season, although traces were found in the early part of August in about 10% of the fields of Burley visited. During the first week of September it was to be noticed

fairly generally in the Burley district, with an occasional field of flue-cured varieties showing signs of infection. The total loss, however, was slight. In Quebec the disease was somewhat more prevalent in both the Yamaska and North Shore districts. The greatest losses occurred on the heavier, rather poorly drained soils, and where tobacco is cropped continuously.

WILT, caused by Fusarium oxysporum
(Schl.) Wolm. var. Nicotianae John.

Three cases of this disease were reported, one from Quebec and two from Ontario.

DAMPING OFF, caused by
Rhizoctonia and Fusarium spp.

In Ontario this disease was present to a limited extent, mostly on glass covered beds. In Quebec approximately 45% of the beds inspected in the Yamaska Valley and 75% in Joliette and Montcalm Counties, were affected. The losses ranged up to 40% in the affected beds.

WILD FIRE, caused by
Bacterium tabacum W. et F.

This disease has not yet been found in Canada.

ANGULAR LEAF SPOT, caused by
Bacterium angulatum Fromme et Murray

This was noted in Canada for the first time during the latter part of the summer of 1922, the crop on two farms in Norfolk County, Ont., being almost destroyed. It was not found in 1923.

DISEASES OF UNKNOWN ORIGIN

MOSAIC

Ont.-

This disease was most prevalent in the flue-cured belt in southern Essex County and to a lesser extent in the Burley districts of Kent and Elgin Counties, Warne, Hickory Prior and White Burley being the most severely affected varieties.

Que.-

A small percentage was present in the majority of the fields inspected, and a few cases of the disease occurred in seed beds in Joliette and Montcalm Counties.

FRENCHING

Occasional plants were observed throughout the Ontario districts.

RING SPOT

A disease similar to the one described by Fromme and Wingard (Virginia Tech. Bull. 25) under this name was found in Essex County in two fields of Broad leaf Burley to the extent of 60% and 1% respectively.

EARLY BLOSSOMING

An entire ten-acre field of Warne in Essex County had to be ploughed up because of the plants having headed out when only about twelve inches in height.

PHYSIOLOGICAL DISEASES

DROUGHT SPOT, HAIL AND WIND INJURY

This caused some loss in Essex County, Ont., shortly after transplanting.

FERTILIZER BURN

This was found in a number of the seed beds in Essex County, Ont. In one instance an over application of fresh manure resulted in a condition resembling root rot.

(T.G. Major)

TOMATO

LEAF SPOT, caused by Septoria Lycopersici Spag.

Man.-

It made its appearance about August 1st at one end of a tomato patch at Brandon, and by the end of the season it had spread fifty feet across the entire patch. It was severe only where first observed, especially in the pruned plants.

Ont.-

Serious at Sturgeon Falls. Fairly common in the Niagara District, but of no economic importance.

Que.-

One report from Sherbrooke County, where there was a serious infection.

P.E.I.-

Severe infection on plants which were staked.

EARLY BLIGHT, caused by
Alternaria Solani (E. et M.) J. et G.

- Man.- It is of occasional occurrence.
- Que.- Quite serious in Sherbrooke County. At Macdonald College there was a heavy infection on leaves and fruit in August and September. Considerable damage was done to the fruit.
- P.E.I.- An infection of 60% was observed at the Experimental Farm, Charlottetown.

DISEASES OF UNKNOWN ORIGIN

BLOSSOM END ROT

- B.C.- Of frequent occurrence. At Summerland, in fields in which estimates were made, the losses ran as high as 6%.
- Man.- At Brandon it was evident in considerable abundance. At Morden it did much damage to thin skinned varieties such as Bonny Best. In southeastern Manitoba it continues to be common and rather serious.
- Ont.- In one greenhouse in Essex County, 25% of the fruit was affected. In Frontenac County 30% was affected, and in Halton County a slight infection was reported. In the Niagara District it is common but not serious this year.

Que.- One report from Sherbrooke County, where a slight loss was incurred.

MOSAIC

Three reports from Essex County, this disease being common both in the fields and greenhouses.

In Missisquoi and Rouville Counties, Que., up to 20% of the plants were affected in ten cold frames inspected.

STREAK

Continues to give trouble in greenhouses both in Ontario and Quebec, especially in those houses which use heavy applications of nitrogenous fertilizers and neglect potash and phosphoric acid.

TURNIP

CLUB ROOT, caused by Plasmodiophora Brassicae Wor.

- Man.- Not found at Morden.
- Ont.- Reported from Thunder Bay District, but not serious.
- Que.- Found to varying extents in Sherbrooke, Matane, Rimouski and Temiscouata Counties.
- N.B.- Very little reported.
- N.S.- In Annapolis County it has been getting somewhat worse each year, gradually spreading from one

field to another, and is more readily found than it used to be. In Hants and Colchester Counties severe infections are recorded. At Nappan Experimental Farm the following infections on varieties are reported:

Danish Sludstrop	30.5%	Sutton's Champion	31%
Bankholm	45	Monarch	16
Best of all	11	Bankholm Purple Top	16
Ditmars	10	Yellow Tankard	13
		Bangholm Club Resistant	%

P.E.I.-

Infections ranging from 3 to 25%.

ROT, caused by Bacillus carotovorus Jones

B.C.-

This disease has been observed in three different places at the time of harvesting. It attacked 80 to 95% of the roots at a farm in Pitt Meadows, but in the other two cases at Milner and Langley Prairie, the damage was almost negligible, amounting to less than .5%.

Man.-

Reported from Morden to the extent of 1%.

F O R E S T A N D S H A D E T R E E D I S E A S E S

ASH (Fraxinus spp.)

LEAF SPOTS, caused by (Piggotia Fraxini B. et C.
(Septoria Besseyi
(Phyllosticta viridis E. et K.

Reported from Manitoba.

BALSAM FIR (Abies balsamea (L.) Miller)

RED HEART ROT, caused by
Stereum sanguinolentum Alb. et Schw.

Very common and destructive in the western portion
of the Province of Quebec.

FEATHER ROT, probably caused by
Poria subacida Pers.

Of frequent occurrence as a butt rot in western
Quebec.

RUST, caused by
Melampsorella elatina (Alb. et Schw.) Arth.

Many witches' brooms found in various parts of
New Brunswick. In York County infection was very
common on reproduction.

BIRCH (white and yellow)
(Betula alba var. papyrifera (Marsh)
Spach. and B. lutea Michx.)

HEART ROT, caused by (Fomes fomentarius Fr.
(Fomes igniarius Fr.

On a representative area in eastern Québec, twenty-
five average trees were selected and felled in
order to secure data upon the wood rots affecting
them. In reality the birch in this area is over-

mature, and from a silvicultural point of view should have been taken out fifty years ago. Every tree examined was badly decayed - 71% by Fomes fomentarius, 8% by Fomes igniarius, and 21% in which both forms were present.

BUTTERNUT (Juglans cinerea L.)

LEAF SPOT, caused by Gnomonia leptostyla (Fr.)
Ces. et de Not.

Again common at Macdonald College, Que., causing premature defoliation.

CHESTNUT (Castanea dentata (Marsh) Borkh.)

BLIGHT, caused by
Endothia parasitica (Murr.) And.

This disease has practically destroyed the chestnuts in the United States, and has now made its appearance in Ontario. At the present time there are many trees diseased in Welland County, and the disease is also known to occur in Norfolk County. It is possible that it will cause very serious losses in any section where the chestnut appears in any quantity.

(R.E. Stone)

ELM (Ulmus americana L.)

LEAF SPOT, caused by
Gnomonia Ulmea (Sacc.) Thüm.

Present in Sherbrooke and adjacent counties, Quebec, to a considerable extent. Also reported from Manitoba,

HORSE CHESTNUT (Aesculus Hippocastanum L.)

LEAF SPOT, caused by
Phyllosticta sphaeropsidea E. et E.

Observed in Perth County, Ont., and in Annapolis,
Digby and Colchester Counties in Nova Scotia.

MAPLES

Acer Negundo L.

LEAF SPOTS, caused by (Phyllosticta Negundinis
(Septoria Negundinis
(Septoria sp.

Reported from Manitoba.

TWIG BLIGHT, caused by
Coryneum Negundinis B. et C.

In the vicinity of Guelph, Ont., the Manitoba Maples
show a blighting of the young twigs caused by the
above named fungus. This is apparently the first
report of this blighting in Ontario. (R.E. Stone)

Acer saccharum Marsh

LEAF SPOT, caused by
Phyllosticta minima (B. et C.) E. et E.

Prevalent in Stanstead Co., Que.

WILT, caused by Verticillium sp.

Severe cases of this disease were observed at Ottawa
and one at Fenwick, Ont. This disease works rapidly;
in one instance a tree about twenty-five feet in
height was killed within three months of the time
that the symptoms first appeared.

OAK (Quercus macrocarpa Michx.)

LEAF SPOT, caused by Phyllosticta livida

Reported from Manitoba.

POWDERY MILDEW, caused by
Microsphaera Alni (Wallr.) Salm.

Reported from Manitoba.

PINES

BLISTER RUST, caused by
Cronartium ribicola F. de Wald.

Pinus monticola Dougl. (Western White Pine)

B.C.-

Infection on both hosts is now general throughout the coastal area of distribution of white pine. Evidence tending to support the theory of long distance aecial spread was obtained when the currant stage of the rust was found at Bella Bella, 110 miles north of the known limit of distribution of white pine and about 100 miles west of the range of white barked pine. Further, Ribes infection was common in the Dry Belt, which, it was hoped, would prove to be a barrier to the eastward spread of rust. Such infection may quite possibly have resulted from aeciospores wind borne from the coast. In the interior rust was found to a much greater extent than last year. In all, 72 infected pines in four localities were located and destroyed. Last year only 14 diseased trees were found. Infection

on black currants was very heavy and widespread, while more infection of wild Ribes was observed this year. In general, rust is apparently firmly established in the valleys of the Arrow and Okanagan lakes, and at one point on Kootenay lake.

Pinus albicaulis Engelm. (White-barked Pine)

B.C.-

Last year a single infected tree in the swelling stage was found at Point Grey. This year aecia were produced. This is the first case of blister rust on this species reported for North America.

Pinus strobus L. (White Pine)

B.C.-

Rust on white pine was observed in Stanley Park, Vancouver, in 1921 and again this year at Agassiz.

Ont.-

Inspection in the Rainy River district failed to reveal the presence of rust on either host. Rust on Ribes was found in several new localities in Renfrew County and across the Ottawa river in Quebec. As has been the case previously in connection with the occurrence of rust in this most northerly known area of distribution, only the currant stage was found, although many pines in close proximity to infected Ribes were carefully examined. Diseased pines were noted in southern Ontario as usual.

N.B.-

Blister rust on both hosts found at two points.

N.S.-

Infection is fairly general in this province, mostly on black currants, but in some instances pines were found diseased.

P.E.I.-

Rust reported from four localities. Confined to black currants.

RUST, caused by
Peridermium Harknessii Moore

Pinus ponderosa Dougl. (Western Yellow Pine)

B.C.-

One heavily infected tree in the arboretum of the Experimental Farm at Agassiz. (Determined by

Dr. E. Bethel)

RUST, caused by
Cronartium cerebrum (Peck.) Hedg. et Long.

Pinus banksiana Lam. (Jack Pine)

Very common in the Thunder Bay District, Ont.

POPLARS

Populus balsamifera L.

LEAF SPOT, caused by Septoria musciva

Reported from Manitoba.

Populus tremuloides Michx.

RUST, caused by Melampsora Medusae Thüm.
MILDEW, caused by Uncinula Salicis (DC.) Winter.
LEAF SPOT, caused by Cladosporium subsessile

All reported from Manitoba,

Populus sp. (Russian Poplar)

RUST, caused by Melampsora Medusae Thüm.
Reported from Manitoba and Saskatchewan.

SERVICE BERRY (Amelanchier alnifolia Nutt.)

RUST, caused by
Gymnosporangium corniculans Kern.

Reported from Manitoba.

SPRUCE (black)(Picea mariana (Mill.) B.S.P.)

RUST, caused by
Melampsoropsis ledicola (Peck.) Arth.

Common at Norway House, Man.

WILLOW (Salix spp.)

RUST, caused by Melampsora Bigelowii Thlm.

Common in Manitoba.

TAR SPOT, caused by Rhytisma salicinum Fr.

Reported from Manitoba.

MILDEW, caused by Uncinula Salicis (DQ.) Winter.

Reported from Manitoba.

CANKER, caused by Valsa sp.

Very common in Manitoba.

D I S E A S E S O F O R N A M E N T A L P L A N T S

AMPELOPSIS SP.

MILDEW, caused by
Uncinula necator (Schw.) E. et E.

Reported from Bethany, Manitoba.

ASTER

WILT, caused by Fusarium
conglutinans Callestephi Beach

B.C.-

Common on young plants at the Experimental Station, Summerland, and present every year at Agassiz.

Alta.-

In the Vauxhall district and at Raymond it was found doing considerable damage.

Man.-

In the south-east it was serious in many places. In the south-west an average of 5% of the plants were attacked, at all stages of development from transplants to maturity. At Morden the damage amounted to 6%.

Ont.-

In the Ottawa district this disease was again prevalent this year, causing losses up to 10% of garden plantings. A specimen was sent from Wako. In the Niagara district there was very little.

Que.-

In Sherbrooke and vicinity it was serious and general.

N.B.-

At the Experimental Station, Fredericton, 20% of a variety bed was killed. All varieties seemed to be

equally susceptible.

P.E.I.-

Not observed.

RUST, caused by
Coleosporium Solidaginis (Schw.) Thüm.

Found to a small extent in south-western Manitoba.

LEAF SPOT, caused by
Septoria Callestephi Gloyer

Common in both south-eastern and south-western Manitoba, causing upwards of 40% destruction of leaf surface.

YELLOW, cause unknown

Reported from south-western Manitoba, causing a loss of 75% of the plants in one garden. Very prevalent also in the Ottawa district.

AZALEA

LEAF GALL, caused by
Exobasidium Vaccinii (Fcl.) Wor.

A florist in London, Ont., submitted a specimen of this disease, and a number of cases have been reported by inspectors at the ports of entry.

BARBERRY

RUST, caused by Puccinia graminis Pers.

B.C. -

Present at the Experimental Farm, Agassiz.

Man. -

The first report of the season was from St. Vital on June 5, when there were a few aecia open.

Ont. - Bushes in Lanark and Carleton Counties reported as

heavily infested.

N.S.-

At Truro 1% of the leaves on bushes were infected on June 20.

BUCKTHORN (Rhamnus spp.)

CROWN RUST, caused by
Puccinia coronata Cda.

Sask.-

Considerable infection at Indian Head.

Man.-

Found at Morden, Gladstone, Winnipeg and at the Agricultural College farm.

Ont.-

Heavy infections in Lanark and Carleton Counties.

CYCLAMEN

ROOT BROWN, caused by Thielavia basicola Zopf.

In the botanical greenhouse at the Central Experimental Farm, Ottawa, a large proportion of the cyclamens showed dark brown to black lesions on the roots; the plants failed to grow normally; few flower buds opened, and those which did showed considerable distortion. Clamydospores of Thielavia were found in abundance on the root lesions. (T.G. Major)

FLOWERING CURRANT (Ribes aureum Pursh.)

LEAF SPOT, caused by Septoria Ribis Desm.

Found in Winnipeg, Manitoba.

HAWTHORN (Crataegus coccinea L.)

LEAF SPOT, caused by Septoria sp.

Reported from Winnipeg, Man.

HOLLYHOCK

RUST, caused by Puccinia Malvacearum Mont.

B.C.-
At the Experimental Station, Summerland, the plants were completely defoliated.

Ont.-
Prevalent in Carleton and Prescott Counties. Also abundant in the Niagara Peninsula.

Que.-
Present, but not serious, in Sherbrooke County.

N.B.-
Destructive wherever this plant is grown. There is a consistent demand for effective control measures.

N.S. -
Unusually prevalent.

P.E.I.-
Infections as high as 100% were noted.

LEAF SPOT, caused by Cercospora Althaeina Sacc.

Quite abundant in south-eastern Manitoba.

HONEYSUCKLE

MILDEW, caused by
Microsphaera Alni (Wall.) Salm.

Reported from Minnedosa, Man.

IRIS

RHIZOME ROT, caused by
Bacillus carotovorus Jones

Ont.-

Not as prevalent this year. Many cases were found associated with the Iris Rhizome Borer (Macronoctua onusta).

P.E.I.-

Small percentage affected.

LILAC

MILDEW, caused by
Microsphaera Alni (Wall.) Sadm.

Common on practically every bush noticed in Essex Co. Reported also from Minnedosa, Man.

PEONY

BUD ROT and LEAF SPOT, caused by Botrytis sp.

Causing some loss in Carleton Co., Ontario, from failure of buds to open, secondary leaf infections, and general unthriftness of the plant due to stem lesions at the ground level and below.

Specimens were sent from Prince Albert, Sask., and Belmont, Man.

LEAF and STEM SPOT, caused by
Septoria Paeoniae West. var. berolinensis Allesch.

At Macdonald College, Que., the infections were estimated at 50% for all varieties.

ROOT ROT, caused by Fusarium spp.

Causing severe root rot of newly planted peonies

at Macdonald College, Que., This was not as prevalent as in 1922.

ROSE

POWDERY MILDEW, caused by
Sphaerotheca pannosa (Wallr.) Lev.

Caused considerable damage to both rambler and bush roses at the Experimental Stations at Summerland and Agassiz, B.C.

RUST, caused by Phragmidium sp.

Man.-

Common, but not serious.

Ont.-

Abundant in the Niagara and Ottawa districts.

P.E.I.-

Severe on wild roses; moderate on cultivated bushes.

BLACK SPOT, caused by
Actinonema Rosae (Lib.) Fr.

Plentiful in the Niagara district of Ontario.

LEAF SPOT, caused by
Cercospora Rosaecola Pass.

Destructive on native roses in both south-eastern and south-western Manitoba. Collections were made at Napinka, Killarney and Brandon. The pathogen was kindly identified by Dr. J.J. Davis of Wisconsin.

CROWN GALL, caused by
Bacterium tumefaciens, E.F.S.

A specimen of this disease on a climber was sent from Meaford, Ont.

SPIRAEA alba

LEAF SPOT, caused by
Septoria salicifolia (Trel.) Berl. et Vogl.

Reported from Neepawa, Man.

SNOWBERRY (Symphoricarpos sp.)

MILDEW, caused by
Microsphaera diffusa Cke. et Pk.

Reported from Winnipeg, Man.

LEAF SPOT, caused by
Septoria Symphoricarpi Hark.

Found at Neepawa and Winnipeg, Man.

SWEET PEA

ROOT ROT, caused by Fusarium sp.

This has been troublesome in some greenhouses in Ontario, especially in those that neglect to use lime in making their compost and grow sweet peas in succession on the same soil. (R.E. Stone)

POWDERY MILDEW, caused by
Microsphaera Alni (Wall.) Salm.

Common late in the season in south-eastern Manitoba.

MOSAIC, cause unknown

Small amount seen in one patch in Prince Edward Island.

D I S E A S E S O F M I S C E L L A N E O U S P L A N T S

Agastache Foeniculum (Pursh) Ktze. Sphaerotheca Humuli (DC.) Burr. Fisher Branch, Man.	Giant hyssop Mildew
Amaranthus retroflexus L. Albugo Bliti (Biv.) Kze. Winnipeg, Man.	Pigweed White rust
Ambrosia trifida L. Puccinia Xanthii (Schw.) Morris, Man.	Great ragweed Rust
Arctium minus Bernh. Puccinia Bardanae Cda, Winnipeg, Man.	Common burdock Rust
Aster cordifolius L. Erysiphe Asterum Inwood, Man. Coleosporium Solidaginis (Schw.) Thüm. Inwood, Man., and Renfrew, Ont.	Purple aster Mildew Rust
Capsella bursa-pastoris (L.) Medic. Peronospora parasitica (Pers.) deB. Olds, Alta.	Shepherd's purse Downy mildew
Cirsium arvense (L.) Scop. Puccinia obtegens (L.) Tul. Lanark and Carleton, Ont. Pyrenochaeta erysiphoides Sacc. Winnipeg, Man.	Canada thistle Rust
Convolvulus sepium L. Puccinia Convolvuli (Pers.) Cast. Neepawa, Man.	Hedge bindweed Rust
Corylus americana Walt. Septoria corylina Peck. Carman, Man. Gnomoniella Coryli (Batsch.) Sacc. Stonewall, Man.	Hazelnut Leaf spot
Dracocephalum parviflorum Nutt. Phyllosticta sp. Fisher Branch, Man.	Dragon head Leaf spot
Hedysarum boreale Nutt. Uromyces Hedysari (DC.) Fekl. Binscarth, Man.	Rust

<i>Helianthus Maximiliani</i> Schrad. <i>Puccinia Helianthi</i> Schw. Winnipeg, Man.	Wild sunflower Rust
<i>Juncus balticus</i> Willd. <i>Uromyces Junci</i> (Desm.) Tul. Kelliher, Man.	Baltic rush Rust
<i>Lathyrus ochroleucus</i> Hooker <i>Uromyces Fabae</i> (Pers.) deB. <i>Phyllosticta</i> and <i>Septoria</i> spp. Fisher Branch, Man.	Everlasting pea Rust Leaf spots
<i>Plantago major</i> L. <i>Erysiphe lamprocarpa</i> (Wallr.) Lev. Grandview and Winnipeg, Man.	Common plantain Mildew
<i>Polygonum aviculare</i> L. <i>Erysiphe Polygoni</i> DC. Winnipeg, Man.; Ottawa, Ont.	Knotweed Mildew
<i>Polygonum Convolvulus</i> L. <i>Puccinia Convolvuli</i> Pers. Winnipeg, Man.	Wild buckwheat Rust
<i>Smilax herbacea</i> L. <i>Phyllosticta</i> sp. Neepawa, Man.	Carrion flower Leaf spot
<i>Solidago</i> sp. <i>Coleosporium Solidaginis</i> (Schw.) Thüm. Neepawa and Winnipeg, Man.	Golden rod Rust
<i>Ribes cynosbati</i> L. <i>Puccinia Pringsheimiana</i> Kleb. <i>Sphaerotheca Mors-uvae</i> (Schw.) B. et C. Parry Sound and Lanark, Ont.	Prickly gooseberry Rust Mildew
<i>Sonchus arvensis</i> L. <i>Septoria sonchifolia</i> Cke. Fisher Branch and Winnipeg, Man.	Perennial sow thistle Leaf spot
<i>Taraxacum officinale</i> Weber <i>Puccinia Taraxaci</i> (Rabent.) Plowr. Grandview, Man., and Ottawa, Ont. <i>Sphaerotheca Humuli</i> (DC.) Burr. Winnipeg, Man. <i>Ramularia Taraxaci</i> Karst. Winnipeg, Man.	Dandelion Rust Mildew Leaf spot

Vicia cracca L.

Uromyces Fabae (Pers.) deB.

Rainy River District, Ont.

Tufted vetch

Rust

The collaborators largely responsible for the reports on the diseases of miscellaneous plants are as follows:-

D.L. Bailey, H. Groh, W.T. MacClement and R.C. Russell.

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