B.J. Sallans.

DOMINION OF CANADA

DEPARTMENT OF AGRICULTURE

EXPERIMENTAL FARMS BRANCH.

H. T. GÜSSOW,
Dominion Botanist.

E. S. ARCHIBALD,
Director.

NINTH ANNUAL REPORT ON THE PREVALENCE OF PLANT DISEASES IN THE DOMINION OF CANADA 1929.

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COMPILED BY:

I. L. CONNERS,
PLANT PATHOLOGIST.

FOREWORD

The present report deals with the prevalence of plant diseases in the Dominion of Canada for the year 1929. As in former years the information was compiled from the records submitted by our collaborators, to whom I wish to express my thanks. I am especially indebted to Drs. Henry and Sanford for their summaries of plant diseases in Alberta and to Dr. Simmonds and Mr. Gordon for summaries on root rot diseases in Saskatchewan and Manitoba. I am also greatly indebted to Mr. R. C. Russell and other members of the Dominion Laboratory of Plant Pathology at Saskatoon for the excellent notes accompanying their records of occurrence of many diseases.

I. L. Conners,
Plant Pathologist.

Division of Botany,
Ottawa, Canada.
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COLLABORATORS

BRITISH COLUMBIA

H. R. McLarty,)
R. C. Roger,) Dominion Laboratory of Plant Pathology,
G. E. Woolliams,) Summerland, B. C.
W. Newton,)
W. Jones,) Dominion Laboratory of Plant Pathology,
C. Yarwood,) Saanichton, B. C.
J. W. Eastham, B. C. Dept of Agriculture, Victoria, B. C.
H. S. MacLeod, " " " " " "

ALBERTA

G. B. Sanford,)
W. C. Broadfoot,) Dominion Laboratory of Plant Pathology,
J. W. Marritt,) Edmonton, Alta.
H. T. Robertson,)
A. W. Henry,)
D. S. Aamodt,) University of Alberta, Edmonton, Alta.
R. Newton,)

SASKATCHEWAN

P. M. Simmonds,)
R. C. Russell,)
G. A. Scott,)
B. J. Sallans,) Dominion Laboratory of Plant Pathology,
H. W. Mead,) Saskatoon, Sask.
C. H. Bryce,)
W. P. Fraser,) University of Saskatchewan,
T. C. Vanterpool) Saskatoon, Sask.
J. H. Ledingham,)
J. W. Scannell, Dominion Experimental Farm, Indian Head, Sask.
J. L. Van Camp, Dominion Forest Nursery Station, Indian Head, Sask.

MANITOBA

J. H. Craigie,)
W. L. Gordon,)
W.A.F.Hagborg,)
B. Peturson,)
T. Johnson,) Dominion Laboratory of Plant Pathology,
W. F. Hanna,) Winnipeg, Man.
Margaret Newton,)
A. M. Brown,)
W. Popp,)
F. J. Greaney,)
G. R. Bisby, Manitoba Agricultural College, Winnipeg, Man.

ONTARIO

G. H. Berkeley, G. C. Chamberlain, L. W. Koch, J. C. Perrault, R. S. Willison, G. O. Madden,	Dominion Laboratory of Plant Pathology, St. Catharines, Ont.
D. L. Bailey, G. B. Montserin,	University of Toronto, Ont.
John Dearness,	London, Ont.
J. E. Howitt, R. E. Stone, D. R. Sands, W. G. Evans,	Ontario Agricultural College, Guelph, Ont.
T. G. Major,	Tobacco Division, Central Experimental Farm, Ottawa, Ont.
F. L. Drayton, Irene Mounce, J. Tucker, A. W. McCallum, J. B. McCurry, H. Groh,	Division of Botany, Central Experimental Farm, Ottawa, Ont.

QUEBEC

H. N. Racicot, B. Baribeau, G. Ethier,	Dominion Laboratory of Plant Pathology, Ste. Anne de la Pocatiere, Que.
J. Coulson, J. E. Machacek, F. L. Godbout,	Macdonald College, Que.

NEW BRUNSWICK

D. J. MacLeod, R. K. Richardson, R. B. MacCormack, C. H. Godwin, R. Harrison, R. J. Macleod,	Dominion Laboratory of Plant Pathology, Fredericton, N. B.

NOVA SCOTIA

J. F. Hockey, K. A. Harrison, W. K. McCulloch, D. F. Putnam, P. E. Donat,	Dominion Laboratory of Plant Pathology, Kentville, N. S.

PRINCE EDWARD ISLAND

R. R. Hurst, L. J. Howatt, S. G. Peppin,	Dominion Laboratory of Plant Pathology, Charlottetown, P. E. I.

DISEASES OF CEREAL CROPS.

WHEAT

STEM RUST - Puccinia graminis Pers.

B. C. -

No rust was observed in 1929. On the experimental plots at Salmon Arm in 1928, several varieties were found infected with stem rust. As far as we are aware this is the first reported collection of stem rust on wheat in B. C.

Alta. -

About 40 barberry seedlings, which had apparently escaped, were found rusted June 24 at Claresholm. Stem rust was first collected on wheat at Vermilion on Aug. 16. Very light infections were found scattered over the province as far north as Legal and St. Paul. It was not abundant in any field nor caused any appreciable damage.

In the uniform rust nurseries, rust was not observed at Lethbridge or Beaverlodge, while traces of rust were recorded on only a few susceptible varieties at Lacombe and Edmonton.

Sask. -

Only traces of rust were collected with difficulty in the district north of Regina on July 5. In the previous ten days, no rust was found from Moose Jaw and Assiniboia, through Weyburn and Indian Head, to Yorkton and Moosomin. Rust was first collected at Saskatoon on July 22, at Borden on July 23, and at Biggar on July 26. On July 29 and 30 traces could be found at most places in the Qu'Appelle Valley and northward through Yorkton, and Wroxton. Although absent on July 27, stem rust was collected July 31, at Indian Head. Traces of rust were reported from numerous places in the province but nowhere did stem rust cause appreciable damage.

Infections of a trace to 10 per cent were observed on the uniform rust nurseries at Indian Head, while the infections were progressively lighter at Saskatoon, Rosthern, Scott and Swift Current, where a trace only was recorded in a few varieties.

Man. -

Traces of stem rust were first found on July 3 at Brandon and Portage la Prairie. None was found the previous week from Winnipeg to Morden, Gretna and Emerson back to

Wheat.

Winnipeg. On July 5 and 6 scattered pustules could be found on wheat throughout this area. Although the stationery spore traps for June 17 showed a heavy shower of urediniospores on that day, infection was not noticeable until the date indicated.

The weather conditions throughout Western Canada as a whole were highly unfavourable for rust development. Only in Manitoba did rust show signs of becoming serious. It was exceptionally dry throughout the growing period; during May and June it was very cold and during July and August unusually hot. In most places drought was a more important factor than rust. In a few fields in the Red River Valley and on the Portage Plains rust may have caused some damage. Infections of 50 to 70 per cent were observed in scattered fields, where the crop was late or heavy. Farther west and northward through Neepewa, Roblin, Birtle and Dauphin, the amount of rust was generally lighter. Durum wheat, except in the rust nurseries, had never more than a trace of rust.

At Winnipeg, in the uniform rust nurseries, 40 to 50 per cent of stem rust developed on the more susceptible varieties of common wheat, while 25 per cent was reported on susceptible durum varieties. At Brandon and Morden rust infection was considerably less.

Ont. -

Stem rust was fairly severe in the rust nurseries at Ottawa and Guelph, 60 to 65 being reported on some varieties.

Que. -

Pycnia, but not aecia, were found on the barberry at Macdonald College on May 26. In the rust nursery at Ste. Anne de la Pocatiere, infection was generally lighter than in Ontario.

N. B. -

Stem rust was heavy at Fredericton in the rust nursery there. Slight to moderate infection was observed in York county.

N. S. -

Two rust nurseries were sown in Nova Scotia, one at Kentville and the other at Nappan. Rust infection was decidedly less at the latter place while at Kentville the infection was typical of other places in eastern Canada.

P. E. I. -
General and moderate infection throughout the province. The rust percentages recorded in the rust nursery at Charlottetown were similar to other places in eastern Canada.

LEAF RUST - Puccinia triticina Erikss.

B. C. -
Considerable leaf rust developed on some varieties in the experimental plots at Salmon Arm.

Alta. -
The first collection of leaf rust was made on July 19 at Claresholm on winter wheat. The infections were very light and not general in the fields. There was much less leaf rust in Alberta in 1929 than in 1928.

Sask. -
Leaf rust was general, but not severe except where the grain was late.

Man. -
Leaf rust was first collected at Morden on June 7. During the first week of July this rust could be found in most fields of common wheat. Generally about 20 per cent of the plants were affected, with the degree of infection varying from a trace to 5 per cent. The infection appeared to be patchy. At St. Adolphe and Niverville, two places south of Winnipeg, in certain spots 80 to 100 per cent of the plants were affected. Later the infection became more general, 50 per cent of the leaf surface being covered with rust.

P. E. I. -
Moderate infection was present on all varieties grown.

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

Alta. -
Stripe rust was prevalent from south of Calgary to the Montana boundary, especially so in the Claresholm district. Only traces occurred north and north-east of Calgary.

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

Alta. -
Bunt was unusually abundant this year throughout the grain growing area and caused an appreciable loss. In one

field as high as 20 per cent of the heads were infected. Tilletia Caries was far more common than T. foetens, which was found in the southern part of the province only, near Cardston.

Sask. -

Wheat bunt was only reported from the southern and eastern parts of the province. In general a trace to 2 per cent was observed. The samples from the southern area on common wheat were infected with Tilletia foetens, samples with the two species mixed were found about Killeher and west, while a collection made at Wroxton was pure T. Caries. Durum wheat was affected only with T. Caries. In one field of durum wheat near Summerberry, 40 per cent of the heads were found infected.

Man. -

Approximately 15 per cent of the cars of durum wheat were infected with bunt, while 1 per cent of common wheat was infected. In one field over 50 per cent of the heads of durum wheat were infected with Tilletii Caries.

N. B. -

Slight infection of wheat by Tilletia foetens recorded for York county.

P. E. I. -

Only traces of bunt caused by Tilletia foetens observed.

LOOSE SMUT - Ustilago Tritici (Pers.) Jens.

Alta. -

Loose smut was more common than bunt. The infections, however, were much lighter and caused less damage. Appreciable loss sustained in a number of fields. Infections were not as general in their distribution as in 1928.

Sask. -

Loose smut was common and widely distributed. Usually only a trace was present, but fields showing increasing amounts of infection up to 7 per cent were observed.

Man. -

Infection with loose smut was general and usually light, being not more than 1 per cent. In several fields of Reward, however, one to 2 per cent was observed. The two highest infections recorded on this variety were 4.5 per cent at

Two Mountains and 7 per cent in the rotation plots at the Experimental Station at Morden. Kota wheat at Gladstone showed 10 per cent of the heads smutted and Marquis at Minto 4.7 per cent.

N. B. -
Slight infection observed in York county.

P. E. I. -
Loose smut was general over the province. Average infection was estimated to be 1.5 per cent.

GLUME BLOTCH - Septoria nodorum Berk.

Alta. -
First collection made at Edmonton on August 15. It was not as prevalent as in 1928 and was confined mostly to the central portion of the province. Damage trace.

Sask. -
Glume blotch was not prevalent in 1929. However, infections observed on heads, stems and leaves, especially on lodged plants.

N. B. -
Slight infection reported for York county.

P. E. I. -
Traces only of glume blotch were found this year. The disease was observed on Huron, tho Fifes and Marquis.

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

Alta. -
Observed several times.

N. B. -
Slight infection recorded for York county.

P. E. I. -
This disease caused considerable loss in Red Fife, White Fife and Huron.

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

P. E. I. -
Not common. It was observed on Kubanka at the Dominion Experimental Farm, Charlottetown.

Wheat.

POWDERY MILDEW - Erysiphe graminis DC.

Alta. -
Not common. First collection was made on June 15 on winter wheat at Edmonton. It was later collected on spring wheat at several places. Mildew caused a slight amount of damage on the experimental plots at Edmonton.

P. E. I. -
Powdery mildew was moderately abundant on Little Club at Charlottetown in September.

ERGOT - Claviceps purpurea (Fr.) Tul.

Alta. -
Ergot was observed on wheat. The disease was comparatively rare in 1929.

P. E. I. -
Ergot on wheat was found once when it was observed on The Experimental Farm, Charlottetown.

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

Alta. -
Basal glume rot was common on wheat being found in widely scattered areas of central Alberta. It was less prevalent than the previous year. It caused a trace to slight damage.

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

Alta. -
There was very little black chaff in 1929. Infections, however, were found in the north central section of the province. At Dapp a field of registered Marquis wheat was 100 per cent infected. Garnet in the same field was clean. Damage trace to slight.

Sask. -
A sample of Reward wheat from Huronville appeared to be affected with black chaff.

N. B. -
Slight infection of black chaff reported from York county.

NEMATODE DISEASE - Heterodera punctata Thorne.

Alta. -
Specimens of this nematode were collected at Cowley and

Stoney Plain on winter and spring wheat respectively.

Sask. -

This disease was observed at two places in east central Saskatchewan. At Muenster the field had been sown to wheat for at least three years in succession. Nematodes were plentiful in certain patches. Affected plants were stunted. At Annaheim wheat plants in a small patch were found to bear many gravid females on their roots. These plants appeared stunted and unthrifty.

BLACK GLUMES - Non-parasitic.

Alta. -

Several specimens of wheat heads showing blackened glumes were received from different parts of the province. This is distinct from black chaff. It apparently does not spread from affected plants to normal ones in the field. Seeds from affected heads when sown, however, give plants which reproduce the abnormality. Several varieties including Reward, Marquis and Red Bobs were affected (A.W. Henry).

CRINKLE JOINT - Non-parasitic.

Sask. -

This disease was observed late in the season at Indian Head on Marquis to a slight extent.

FOOT AND ROOT-ROT DISEASES OF CEREALS.

As the root-rots caused by different root-rotting organisms are similar in appearance and are not infrequently difficult to separate from each other, they are here treated together for each province.

Alta. -

The observations reported for Alberta refer only to these diseases as they appear on wheat.

Take-all (*Ophiobolus graminis* Sacc.). It was very difficult to find typical symptoms of take-all. Light infections were found north and west of Edmonton, where moisture was sufficient to produce fairly good crops. Perethecia were found only near Spruce Grove. Damage was slight.

Most of the root-rot damage appeared to be caused by *Helminthosporium sativum* Pamm. King and Bakke, *Fusarium* spp. *Wojnowicia graminis* (McAlp.) Sacc. & D. Sacc. and *Leptosphaeria*

herpotrichoides de Not., although it was difficult to evaluate the damage on account of drought injury. Garnet wheat appeared to be less heavily attacked than other common varieties. Leptosphaeria herpotrichoides was found to be widely distributed in central Alberta, while Wojnowicia graminis, Helminthosporium sativum and Fusarium spp. were general in all parts of the province.

Heavy infection of foot-rot causing severe damage was observed on the continuous wheat plots at the School of Agriculture at Claresholm, while the damage was only a trace on the rotation plots.

The following fungi were also collected on wheat: Mycosphaerella Tulasnei (Jancz.) Lindau, Ascochyta graminicola Sacc. Macrophoma Hennebergii, (Kühn) Berl. & Vogl.

Seedling root-rot causing significant damage was not observed this year.

Browning caused by Pythium spp. was not observed in Alberta.

Sask. -

In recording observations on root-rots of cereals in Saskatchewan four types of root-rot are recognized: take-all (Ophiobolus graminis), prematurity blight, browning, and Helminthosporium-Fusarium rot (Helminthosporium sativum and Fusarium Spp.)

In prematurity blight individual plants are affected here and there throughout the field. The plant appears normal in every way except that it takes on a distinct bleached appearance while healthy plants are still green. The heads are also invariable empty. The cause of the disease is unknown.

Browning appears on seedlings when they are about four to six weeks old, the lower leaves suddenly turning brown and dying. The disease occurs in large patches. The growth of the plant is retarded and late in the season the diseased areas are noticeable by the thin stand of single tiller plants and abundant weed growth. (1)

(1) These four types of root rot are more fully outlined in: Root-rots of Cereals. Dom. Can. Exp. Farm Circ. 72. 1929.

Cereal Root-rots.

The root-rot survey in Saskatchewan embraced the important crop districts. The extremely dry weather interfered greatly with the diagnosis of these diseases. In all 666 fields were examined and reported; 481 were in wheat, 96 in oats, 70 in barley, 16 in rye and 3 in flax.

The distribution of root-rot types and severity of disease on different cereals is shown in the table 1.

This season differed from previous years by the predominance of the Helminthosporium-Fusarium type. Prematurity blight was difficult to recognize as in general the dry weather shortened the ripening period.

There were not as many cases of take-all reported as usual; but in all probability the symptons were masked by the lack of rain.

More than one type of root-rot was frequently observed in the same field. In 481 fields of wheat, 297 or 61.7 per cent showed one type of root rot; 122 or 25.3 per cent 2 types, 7 or 1.4 per cent 3 types and 58 or 11.6 per cent were free from disease.

The amount of injury caused by root-rots in 807 cases reported for all crops was as follows:-

No injury occurred in			16.5	per	cent	of	the	cases.
Injury trace	"	"	30.9	"	"	"	"	"
Injury slight	"	"	33.4	"	"	"	"	"
Injury moderate	"	"	15.9	"	"	"	"	"
Injury severe	"	"	3.3	"	"	"	"	"

From his studies of take-all Russell (2) believes that the casual organism, Ophiobolus graminis Sacc. is indigineous to Western Canada. The disease is confined mainly to the semi-wooded areas. Where take-all is prevalent the disease causes noticeable damage in the second and succeeding crops after new breaking. If the field is summer-fallowed, or a crop of oats is grown, very little take-all may appear for several years. After land has been raising western rye grass or brome grass for a number of years and is then broken and sown to wheat, take-all causes severe injury. The actual loss from Take-all is difficult to estimate accurately, but the collective damage throughout Saskatchewan in wet years is at present very great.

(2) Russell, R. C. Field studies of take-all in Saskatchewan. Sci. Agr. 10: 654-668. 1930.

Table 1.

Distribution of Root-Rot types and severity on different cereals in Saskatchewan, 1929.

Crop		Root Rot Type	Trace	Slight	Medium	Severe	Total
WHEAT	A.	Take-all	49	15	5	7	76
	B.	Prematurity blight	17	3	0	1	21
	C.	Browning	35	42	16	2	95
	D.	Helminthosporium-Fusarium rot.	111	142	95	16	364
		Normal	--	--	--	--	59
OATS	B.	Prematurity blight	1	1	0	0	2
	D.	Helminthosporium-Fusarium rot.	10	31	5	1	47
		Normal	--	--	-	-	47
BARLEY	A.	Take-all	1	0	0	0	1
	B.	Prematurity blight	1	0	0	0	1
	C.	Browning	2	5	1	0	8
	D.	Helminthosporium-Fusarium rot	19	19	6	0	44
		Normal	--	--	-	-	22
RYE	C.	Browning	1	0	0	0	1
	D.	Helminthosporium-Fusarium rot	2	11	0	0	13
		Normal	-	--	--	-	3
FLAX		Normal	-	-	-	-	3
		TOTAL :	249	269	128	27	807

Cereal Root-rots

While studying the browning root-rot of cereals Vanterpool and Ledingham (3) found a fungus belonging to the lower Phycomycetes, hitherto undescribed, associated with rootlet injury of wheat. The organism was named Lagena radicicola. They are of the opinion however, that the fungi really responsible for the trouble in most instances are species of Pythium or of closely related genera.

Vanterpool (4) has also reported, as the results of his experiments, that Asterocystis radicis de Willd. is a normal inhabitant of Saskatchewan soils. Although the fungus has been found in finer rootlets of oats, wheat, barley, rye, maize, western rye grass and field mustard (Senapsis arvenis L.) in potted soil and barley in the field, he doubts whether it could cause any significant damage except under the most favourable conditions and then only on oats.

Man. -

During 1929, two hundred and thirty collections of plants, all apparently infected with root and foot-rotting organisms, were made in 108 localities within the province. The majority of the collections were obtained from wheat and barley, but a few from oats and rye.

Root-rots and foot-rots were not confined to any definite localities, but were widely distributed throughout the grain-growing area of the province. Infected plants could be found, to a greater or less extent, in almost every field of wheat and barley examined. Very few of the fields of oats and rye showed infection by root-rotting organisms.

The amount of infection in different fields varied from a mere trace to almost one hundred per cent of the plants. Approximately twenty-five per cent of the fields of wheat and barley showed infection of fifty per cent of the plants, or more. Infected plants generally appeared to be more prevalent in the lighter soils, although they were by no means confined to them.

Foot-rot symptoms were more evident than definite injury to the root. The basal part of infected plants, between the crown and first node, showed distinct browning. These plants were not always limited to definite patches in the fields, but

(3) Vanterpool, T.C. and Ledingham, G.A. Studies on "browning" root-rot of cereals. I. The association of Lagena radicicola n.gen; n.sp., with root injury of wheat. Can. Jour. Research 2: 171-194. 1930.

(4) Vanterpool, T.C. Asterocystis radicis in the roots of cereals in Saskatchewan. Phytopath. 20:677-680. 1930.

isolated plants also showed this discoloration. In a few fields, however, the roots of the plants were poorly developed and discolored, but the basal part of the stems was normal. Occasionally, both the roots and the basal part of the stem were discolored.

Isolations made on potato dextrose plates from the discolored basal part of the stem and from the roots of apparently diseased plants yielded Helminthosporium sativum P.K.& B., and Fusarium spp. Helminthosporium was more frequently isolated this year, from individual collections, than Fusarium, although the latter was also commonly present.

Take-all (Ophiobolus graminis) was not detected this year by a macroscopic examination of the plants in the field, although it was frequently found in 1928. The severe drought during the summer may have seriously retarded its development. It does not seem possible that it could be entirely absent.

There is no doubt, that where there is a heavy infection, root-rotting organisms are causing a decided reduction in the yield, particularly of wheat and barley. However, if the infection is only slight, the plants appear to be capable of maturing seed, with little, if any reduction in the yield, especially if growth conditions are favourable (W.L.Gordon).

OATS

STEM RUST - Puccinia graminis Pers.

Alta. -
Stem rust on oats was first collected at Wainwright on Aug. 17. Later a few infections were found north and east of Edmonton. No damage.

Sask. -
Traces of stem rust were found fairly generally in the south-eastern part of the province, but no damage was done.

Man. -
Stem rust was general over the province. Oats, which were sown fairly early, were only lightly affected. However, the degrees of infection was heavier as the oats were later. Very late oats were rather heavily rusted and the yield in some cases was lowered, but as the later sown oats constituted only a small portion of the crop the loss due to rust was small or negligible.

N. B. -
This disease was prevalent in York county.

P. E. I. -
Stem rust became prevalent late in the season. It was common on all the varieties grown in the province.

LEAF RUST - Puccinia coronata Corda.

Man. -
Traces of leaf rust were found at several places, but nowhere was the rust severe enough to do damage. A buckthorn hedge on a farm south of Boissevain was found heavily infected with the aecial stage. The nearest oats were sown some distance, however, from the hedge and no rust was observed on the plants. Several species of buckthorn were found rusted at the Experimental Station, Morden.

Ont. -
Rust on the buckthorn was collected on May 29 at Ottawa. The rust was heavy on oats in the smut experiment plot, C.E.F., Ottawa, Ont.

N. B. -
Leaf rust was prevalent in York county.

N. S. -
A moderate infection of leaf rust was found to be quite general in fields examined in four counties of central Nova Scotia.

P. E. I. -
Heavy infection was observed on all varieties. The rust was also collected on the buckthorn July 15.

SMUTS.

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

B. C. -
A small amount of loose smut occurs each year resulting in very slight losses.

Alta. -
Both smuts are relatively common. Damage was usually only a trace, but losses of 20 per cent occurred in individual fields. The total would be considerable.

Sask. -
Covered smut is far more prevalent and destructive than loose. The following tabulation shows the relative prevalence:-

Oats.

Percentage Infection	Number of fields Covered smut	Loose smut
trace	3	2
1 - 4	8	3
5 - 9	3	0
10 - 14	4	0
15 - 19	6	1
20	3	0
25	1	0

Man. -
Covered smut only was reported, infection varying from a trace to 5 per cent.

Que. -
In a field, where the seed was untreated, 30 per cent infection was observed. In a neighbouring field, where treated seed was sown, only 2 per cent of smut was found.

N. B. -
Covered smut was reported as prevalent where the seed had not been treated. Loose smut was also fairly abundant.

N. S. -
Both loose and covered smut were observed, the two species being frequently mixed together in the same field. Infection varied from 1 to 40 per cent.

P. E. I. -
Loose smut was reported as general over the province. In a field at Charlottetown infection of 10 per cent was recorded.

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

Alta. -
Halo blight was not common; less present than last year. Damage trace.

Sask. -
This disease was reported to be causing considerable leaf spotting at Cudworth.

Man. -
A variety (Minota x Wh. Russian) x Black Mesdag, No. 378, was badly spotted with halo blight especially on the older leaves in a variety plot at the Experimental Station, Morden.

This was the only variety in the midst of numerous other varieties to be affected. The disease was also present in the same variety at Winnipeg.

N. B. -
A slight amount of halo blight was present in York county.

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

This disease was recorded once on Banner at Charlottetown, P. E. I., and it was found causing slight infection in York county, N. B.

ANTHRACNOSE - Colletotrichum graminicolum (Ces.) Wilson.

Anthracnose was reported from Falher in the Peace River district, Alberta. A moderate infection of Banner was recorded at the Experimental Farm, Charlottetown, P. E. I.

ERGOT - Claviceps purpurea (Fr.) Tul.

Ergot was observed on oats in Alberta although the disease is rare this year.

BLAST - Non-parasitic.

Alta. -
This disease caused much damage throughout the province.

Sask. -
Blast was observed in many places, but generally it was causing only slight damage, except at Saskatoon where it was reported as common and severe.

P. E. I. -
Trace of blast occurred on Banner.

B A R L E Y

STEM RUST - Puccinia graminis Pers.

Alta. -
Stem rust was extremely rare.

Sask. -
Traces of rust were collected in the Qu'Appelle Valley and northward through Yorkton and Wroxton.

P. E. I. -
A trace of stem rust was found on Charlottetown No. 80.

Barley.

LOOSE SMUT - Ustilago nuda (Jens.) Rostr.

Alta. -
Loose smut was widely distributed, but was much less abundant and destructive than covered.

Sask. -
Although loose smut was widely distributed the infections were usually not more than 1 per cent. In only one field was the infection estimated to be from 5 to 10 per cent.

Man. -
Loose smut was collected a few times; usually small percentages.

N. B. -
This smut was reported to occur in York county.

N. S. -
Out of three fields examined in Pictou county one showed 3 per cent infection; the other two were free from smut.

P. E. I. -
A trace of infection was reported on Charlottetown No. 80 in the counties of Queens and Kings.

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

Alta. -
Covered smut was common, causing important losses. The damage ranged from a trace to 30 per cent.

Sask. -
Covered smut was widely distributed, infection varying as follows:- 4 fields showing a trace; 8 with 1 to 4 per cent; 5 with 5 to 9 per cent and 1 field with 17 per cent.

N. B. -
Only slight infection with covered smut was observed in York county.

P. E. I. -
Two reports of covered smut on Charlottetown No. 80 on the Experimental Farm, Charlottetown.

STRIPE - Helminthosporium gramineum Rabh.

Stripe was found on widely scattered fields throughout Alberta. Damage was slight. This disease was more serious

in the experimental plots at Edmonton than in 1928. This was believed to be due to the temperature being more favourable for the development of the disease. Some heavily infected plants were found at Beaverlodge, Peace River district.

The disease was reported to be quite prevalent on all varieties in New Brunswick and Prince Edward Island. It was also observed once in Quebec.

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

Alta. -

Net blotch was widely distributed, but much less abundant than in 1928. Damage was trace to slight.

Sask. -

Although net blotch was widely distributed usually, infection was slight and the damage nil. In occasional fields infections were moderate to heavy, resulting in the premature death of the lower leaves. Hooded barley seemed to be more resistant than the common bearded varieties.

Man. -

In one field near Portage la Prairie a moderate infection of net blotch was observed.

P. E. I. -

Slight infection on Charlottetown No. 80 in Queens and Prince counties, and also on other varieties at the Experimental Farm, Charlottetown.

SPOT BLOTCH - Helminthosporium sativum Pamm. King & Bakke.

This disease was more common in Alberta than last year. The experimental plots at Edmonton were badly infected. Damage was trace to slight. The disease also caused a foot rot in seedlings in a greenhouse at Macdonald College, Que.

M I S C E L L A N E O U S D I S E A S E S.

SCALD - Rhynchosporium Secalis (Oud.) Davis.

Scald was fairly common, but less in evidence than last year in Alberta. Damage trace. A light infection was also reported from Saskatoon, Sask.

Barley.

ERGOT - Claviceps purpurea (Fr.) Tul.
Ergot was reported on barley for Alberta and N. B., but in both provinces it was rare.

POWDERY MILDEW - Erysiphe graminis DC.
Slight infection reported throughout P. E. I.

BACTERIAL BLIGHT - Pseudomonas translucens Jones, Johns. & Reddy.
Light infections of this disease were observed several times on barley.

FALSE STRIPE - Cause unknown.
Slight infections were reported twice from Saskatchewan. The Heterosporium associated with this disease has been reported by Bisby et al, (Fungi Manitoba 1929) as being close to H. Avenae Oud.

Hormodendron Hordei Bruhne was collected on variety Regal at Beaverlodge, Alta. (W. C. Broadfoot).

R Y E .

LEAF RUST - Puccinia dispersa Erkss.

Leaf rust was fairly common but the infections were light in Alberta.

ERGOT - Claviceps purpurea (Fr.) Tul.

Alta. -
Ergot was observed on rye. It was however, comparatively rare this year.

Sask. -
Ergot was rare and only traces were found except on volunteer rye in a field of wheat on sandy soil. In the southern part of the province only one collection on rye was made. Up to this year, ergot had been getting more and more serious every year.

DISEASES OF FORAGE AND FIBRE CROPS.

ALFALFA

LEAF SPECK - Pseudopeziza Medicaginis (Lib.) Sacc.

Alta. -
This disease is frequently observed, but it causes slight if any damage. Specimens were collected at Beaverlodge, Peace River district.

Sask. -
Moderate to heavy infections were observed in two locations. Usually the infection is light.

Ont. -
A very heavy infection developed in a 3 year old cover crop in a cherry orchard. This fact suggests that this disease may prove a real factor in the use of alfalfa for such a purpose.

This disease caused only slight infections in Quebec, N. B. and P. E. I.

OTHER DISEASES

ROOT ROT - Sclerotinia Sclerotiorum (Lib.) de Bary.
This disease is reported on alfalfa from Alberta. Not usually serious on this host.

ROOT ROT - Plenodomus Meliloti Dearn. & Sanford.
Common on Alfalfa in Alberta. May cause serious damage.

DOWNY MILDEW - Peronospora Trifoliorum de Bary.
Infection was noted only in low lying areas in York county, N. B.

WINTER INJURY - Non-pathogenic.
Injury occurred in some localities in the winter 1928-29, in B. C.

COMMON CLOVER.

RUST - Uromyces Trifolii (Hedwf.) Lev. and U. Trifolii-repentis Liro.

Alta. -
The aecial stage of U. Trifolii-repentis was collected at Wabumun, Alta. Infection light and patchy.

N. B. -
A slight general infection of U. Trifolii was observed in York county.

Common Clover.

N. S. -
A moderate infection of U. Trifolii was reported on second growth of red clover in a field at Annapolis causing slight leaf wilting.

P. E. I. -
As rust is said to be common on all clovers in P. E. I., it is probable that both species have been seen there.

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

P. E. I. -
Common about Charlottetown, but not important.

N. B. - Slight infection was reported in York county.

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

Que. -
General south of Montreal on white clover. A collection of sooty spot was made at Murray Bay on alsike clover. Infection light.

N. B. -
Slight infection of sooty spot in York county.

P. E. I. -
Common on clovers at the Experimental Farm, Charlottetown.

POWDERY MILDEW - Erysiphe Polygoni DC.

B. C. -
Mildew was general on red clover.

Que. -
Reported on white clover from Rougement.

N. B. -
Slight general infection in York county.

N. S. -
Most of the second growth in hayfields showed scattered to general infection of mildew.

P. E. I. -
Mildew reported as general throughout the province on red clover.

Common Clover.

DOWNY MILDEW - Peronospora Trifoliorum de Bary.

This disease occurred generally over Prince Edward Island, but it caused very little damage.

MOSAIC - Virus disease.

B. C. -
This trouble occurred to a slight extent throughout the Okanagan Valley on white clover.

N. B. -
Only isolated specimens were observed to be diseased in York county.

P. E. I. -
Plants affected with mosaic were recorded at several places near or on the Experimental Farm, Charlottetown.

SWEET CLOVER.

STEM CANKER - Ascochyta Meliloti (Trel.) Davis.

Alta. -
Light infection of stem canker was present. Specimens were collected at Edmonton.

Sask. -
Stems of the first crop stubble were found rather heavily diseased at Clavet.

Man. -
Collected at Dauphin on yellow sweet clover.

ROOT ROT - Sclerotinia Sclerotiorum (Lib.) de Bary.

This root rot caused some damage in Alberta, principally on sweet clover.

ROOT ROT - Plenodomas Meliloti Dearn. & Sanford.

This disease was common in Alberta especially on sweet clover, on which crop the damage was often severe. Certain of the experimental plots at Saskatoon were heavily diseased probably by the same fungus.

CORN.

COMMON SMUT - Ustilago Zeae (Beck.) Unger.

Ont. -
Specimens sent for determination from Maitland and Vankleek Hill.

Corn.

Que. -
Up to 4 per cent of the plants were found infected in six home gardens at Ste. Anne de Pocatiere. It was reported as not very common in Iberville township, St. Johns county.

N. B. -
Infection was reported as slight in York county.

RUST - Puccinia Sorghi Schw.

Traces of rust were observed and collected at the Experimental Station, Charlottetown, P. E. I.

FLAX.

WILT - Fusarium Lini Bolley.

Alta. -
In a varietal test at Vermilion, Premost was susceptible while North Dakota 52, Crown and Novelty were partially resistant.

Sask. -
Specimens sent from the Dominion Experimental Station, Swift Current were affected with wilt, but the extent of the damage was not reported.

RUST - Melampsora Lini (Pers.) Desm.

Traces of rust were reported from Saskatchewan.

SUNFLOWER

WILT - Sclerotinia Sclerotiorum (Lib.) de Bary.

Alta. -
Observed on sunflower. Caused some damage.

Sask. -
Caused the death of a dozen plants in a small planting on the Experimental Station, Rosthern.

Que. --
Four per cent infection observed in one field at Ste. Anne de la Pocatiere. The disease did not seem to spread rapidly this year. Infected plants were very scattered.

N. B. - Slight infection was reported in York county.

N. S. -
The disease was present in 2 fields at Hortonville, infection being trace and 5% respectively. This disease was found only in Kings county. Not over 2 per cent of the plants were affected in any one field except at Kentville.

Sunflower.

RUST - Puccinia Helianthi Schw.

Sask. -
Traces of the aecial stage were reported from Indian Head and Saskatoon, on July 2 and July 16 respectively. Only a trace of the uredinial stage was present on Aug. 23 at Indian Head.

N. B. -
Slight infection recorded for York county.

N. S. -
Rust was present on Mammoth Russian at the Experimental Station, Kentville.

LEAF SPOT - Septoria Helianthi Ell. & Kellerm.

Alta. -
This leaf spot was collected at Edmonton.

N. S. -
This disease was prevalent on several pure lines and varieties of sunflower.

DOWNY MILDEW - Plasmopora Halstedii (Farl.) Serl. & de Toni.

This disease was observed at Hortonville, N. S., where the diseased plants were very dwarfed and stunted. About one per cent of the plants were infected. This is the first report of the disease from Nova Scotia.

CHLOROSIS - Cause unknown.

A chlorosis of sunflower was observed at Melfort and on the Experimental Station, Rosthern, Sask., by R. C. Russell. The symptoms as described by him are as follows:-
Rosthern - Some plants were stunted to half the average height of the healthy and were entirely chlorotic. Others were only partially chlorotic and slightly or not at all stunted, chlorosis being largely confined to the upper leaves. Roots were normal.
Melfort - In addition to the above symptoms some of the chlorotic plants were dead and in some cases one side of a plant or a leaf was chlorotic while the remaining portion was green.

CULTIVATED GRASSES.

Awnless Brome (Bromus inemis).
Ergot (Claviceps purpurea (Fr.) Tul. was found at Cardston, Alta.

Cultivated Grasses.

Broom Millet (Panicum miliaceum).
Smut (Sorosporium Panici-miliacei (Pers.) Takah.) A trace of this smut was observed at Indian Head, Sask.

Sudan Grass (Holcus Sorghum sudanensis).
Bacterial leaf spot (Bacillus Sorghi Burr.) was collected at Edmonton, Alta.

Timothy (Phleum pratense L.)

Stem rust (Puccinia graminis Pers. var Phlei-pratenis (Erikss. & Henn.) Stakm. & Piemeisel) scattered infections of stem rust were observed, especially from Edmonton southward. Less frequent than last year. Caused no loss. Traces of rust were also reported from P. E. I.

Leaf spot (Heteropsorium Phlei Gregory) was present in Alberta, but it was of very slight importance.

Western Rye Grass (Agropyron tenerum)
Smut (Ustilago bromivora (Tul.) Fisch.) caused severe damage in small plots at Edmonton and Claresholm, Alta.

Ergot (Claviceps purpurea) was collected at Wembly, Alta,

MISCELLANEOUS CROPS

Hemp.
Specimens of hemp affected with a Fusarium were collected at Vermilion, Alta.

Soy Bean.
Mosaic (virus) was severe in the plots at the Summerland Experimental Station, B. C.

Buckwheat.
Leaf spot (Ramularia rufomaculans Pk.) was of general occurrence at St. Cesaire, Que.

Vetch.
Leaf spot (Ascochyta sp.) was recorded on vetch at the Experimental Station, Charlottetown, P. E. I.

DISEASES OF VEGETABLE AND FIELD CROPS.

ASPARAGUS

RUST - Puccinia Asparagi DC.
Traces of rust reported from Queens county, P. E. I.

DAMPING OFF - Rhizoctonia sp.
Rhizoctonia caused a slight amount of damping off at Fredericton, N. B.

BEAN

MOSAIC - Virus disease.

B. C. -
Mosaic was found on the majority of fields planted to wax beans.

N. B. -
Slight infection was observed in several vegetable gardens in York county

P. E. I. -
Moderate infection was reported in some unnamed varieties in Queens county.

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

Sask. -
Five to ten per cent of the plants were infected in a garden at Saskatoon.

Que. -
The disease was frequently very injurious. Serious outbreaks were reported at Ste. Genevieve and Lac de Vincennes, where a reduction in yield of 75 per cent occurred. At St. Augustin there was a loss of 50 per cent in a half acre field. The disease was also fairly prevalent south of Montreal.

N. B. -
Anthracnose was common, but not severe.

P. E. I. -
All the varieties in the experimental plots at Charlottetown were infected.

Bean.

BACTERIAL BLIGHT - Pseudomonas Phaseoli E. F. Sm.

Ont. -
Beans affected with bacterial blight were sent from Cornwall for examination.

Que. -
This disease was reported as quite general at Vercheres. The damage was confined to the low spots.

N. B. -
Slight occurrence of the disease was reported.

P. E. I. -
A trace only of bacterial blight was observed on an unknown variety.

MISCELLANEOUS DISEASES

WILT - Botrytis cinerea Pers.
Only isolated specimens were observed on the Experimental Farm, Fredericton, N. B.

STEM ROT - Rhizoctonia Solani Kühn.
Common in gardens in Queens county, P. E. I.

WILT - Sclerotinia Sclerotiorum (Lib.) de Bary.
Slight occurrence in N. B.

BEET

LEAF SPOT - Cercospora beticola Sacc.

N. B. -
Slight infection reported.

N. S. -
General but light infection observed in a market garden of 3 acres. Apparently the disease was causing little injury.

P. E. I. -
General throughout the province, but not important.

SCAB - Actinomyces scabies (Thax.) Güssow.

N. B. -
Isolated cases only were observed.

P. E. I. -
Traces were found in gardens near Charlottetown. Probably general over the province.

CABBAGE

CLUB ROOT - Plasmodiophora Brassicae Wor.

B. C. -

Club root caused considerable loss to the cabbage crop at Armstrong. Infection, however, was much less severe than in 1928. The marked reduction in the amount of the disease was attributed to the soil being unusually dry this year, while last year the land was flooded and the soil exceptionally wet.

Que. -

The disease was prevalent in 5 home gardens at Ste. Anne de la Pocatiere. It was specially severe in one, where 50 per cent of plants were so badly infected that they were a total loss. The same was true of about an acre field in St. Johns.

N. B. -

Severe infection of seedling plants was reported. These plants were rendered unfit for transplanting into the field. The disease was severe in the field in all infected areas.

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

The disease was observed at St. Etienne des Grès, Que., in plants uncut from an early crop. About 50 per cent of these plants were destroyed which represented about 10 per cent of the ½ acre plot.

Black rot was also observed at Ottawa, Ont.

SOFT ROT - Bacillus carotovorus L. R. Jones.

A slight amount of soft rot occurred in York County, N. B.

CARROT

SCLEROTIAL ROT - Sclerotinia Sclerotiorum (Lib.) de Bary.

This rot was serious in stored carrots at Kentville, N. S. Up to 70 per cent of the carrots were destroyed.

BLACK ROT - Alternaria radicina Meier, Drechsler & Eddy.

The disease was observed on specimens from a local grocery store in Fredericton.

CAULIFLOWER

CLUB ROOT - Plasmodiophora Brassicae Wor.

In a half acre field in St. Johns, Que. about 60 per cent of the plants were affected. The diseased plants produced no heads. Moderate infection of cauliflower was also reported from N. B.

SOFT ROT - Bacillus carotovorus L. R. Jones.

Slight amount of soft rot was reported in York county, N. B.

CELERY

LATE BLIGHT - Septoria Apii Chester

Que. -
Late blight is sometimes severe in Que. On the island of Montreal the disease was quite general, but it was often very well controlled. In Abord à Plouffe, slight infection occurred generally over a 6 acre field except in about half an acre where the loss was estimated to be 50 per cent. In another field of about a fifth of an acre, the crop was a total loss. This celery was neither sprayed nor dusted. At Cap Rouge a loss of 90 per cent occurred in a small plot.

N. B. -
Moderate infection was reported.

P. E. I. -
The disease was observed at Charlottetown, but it was of no importance this year.

CUCUMBER

MOSAIC - Virus disease.

Ont. -
A serious outbreak of mosaic occurred at Beamsville. About 40 per cent of the plants were infected in a fairly large block.

Que. -
In a 3 acre field in Abord à Plouffe about 2 per cent of the plants were affected. Loss was slight.

P. E. I. -
Mosaic was common at the Experimental Farm, Charlottetown.

FRUIT SPOT (SCAB) - Cladosporium cucumerinum Ell. & Arth.
Que.-
Around Montreal the disease was found in nearly every

field. In Ste. Flore a loss of 50 per cent occurred in 1-10 acre field. In Abord à Plouffe fruit spot was very severe in a 3 acre field; about 75 per cent of the fruits attacked. In Three Rivers a ¾ acre field of pickling and table cucumbers was almost a total loss.

N. B. -

Fruit spot was less severe than 1928. One field showed a loss of 25 per cent.

BACTERIAL WILT - Bacillus tracheiphilus E.F.Sm.

Ont. -

About 75 per cent of the plants infected in a small plot of a few hundred plants at Beamsville.

Que. -

Affected plants were sent in for examination from one grower in the Montreal district.

N. B. -

Isolated cases of wilt were observed in York county.

ANTHRACNOSE - Colletotichrum lagenarium (Pass.) Ell. & Halst.

Anthracnose caused slight injury in a greenhouse in Cape Breton, N. S. Lesions were present on both leaf and fruit.

EGG PLANT

WILT -

About 40 per cent of the plants affected in plot of 2500 plants at Jordan, Ont. Verticillium and Fusarium were isolated from the diseased plants. Three small infected areas were also observed in another field of about 5000 plants.

LATE BLIGHT - Phytophthora infestans (Mont.) de Bary.

Late blight was recorded once on the Experimental Farm, Charlottetown, P. E. I.

HORSE-RADISH

PALE LEAF SPOT - Rumularia Armoraciae Fuck.

Slight infection was reported in York county, N. B.

JERUSALEM ARTICHOKE

WILT - Sclerotinia ?Sclerotiorum (Lib.) de Bary.

Wilt caused a very slight amount of damage to Jerusalem artichoke in N. B.

LETTUCE

DROP - Sclerotinia Sclerotiorum (Lib.) de Bary.
This disease was only slightly prevalent in areas where lettuce is grown intensively in N. B.

GREY MOULD - Botrytis cinerea Pers.
Grey mould was only slightly prevalent in isolated localities in N. B.

TIP BURN - Non-parasitic.
Wherever head lettuce was grown in the Okanagan Valley, B. C., the damage from tip burn was as severe as usual.

MANGEL

BLACK LEG - Phoma Betae (Oud.) Frank.
A serious crown rot due to this organism developed on a series of fertilizer-lime plots at the Experimental Station, Kentville, N. S. The soil that was most favourable for the development of the crop appeared also to favour the disease.

STORAGE ROT - Corticium Solani (Prill. & Del.) Bourd. & Galz.
A serious rot occurred in storage at the Experimental Station, Fredericton, N. B. Rhizoctonia was found to be constantly associated with the trouble.

MELON

BACTERIAL WILT - Bacillus tracheiphilus E.F.Sm.
Bacterial wilt was serious in about an acre planting at Beamsville, Ont; about 20 per cent of the plants were affected. Diseased plants were also received from Renfrew.

ONION

SMUT - Urocystis Cepulae Frost.
About 85 per cent loss resulted from onion smut in 2 acre field at Rosemount, Que.

NECK ROT - Botrytis Allii Munn.
Losses from neck-rot were greater this year than last in Okanagan Valley, B. C. Rain interfered somewhat with the harvesting of the crop while in 1928 the autumn was exceptionally dry and ideal for the curing of the crop.
This disease was reported as occuring commonly on red varieties at Charlottetown, P. E. I.

BULB ROT - Fusarium sp.
In British Columbia Fusarium bulb rot has not been found outside the Kelowna district. In this district the disease

has gradually spread each year to new fields and most of the land used for onion production is now infected with the pathogen. A loss as high as 50 per cent has occurred in some fields

MACROSPORIUM ROT - Pleospore herbarum (Pers.) Rabh.
(Macrosporium parasiticum Thüm.)

The perfect stage was collected Apr. 26 at Macdonald College, Que., on dead seed stalks of the onion. The asci were just maturing. The imperfect stage began to appear on the onion seed stalks on Aug. 12 and it spread rapidly in the next two weeks.

PEA

LEAF AND POD SPOT - Ascochyta Pisi Lib.

Que. -

This disease was found mostly in fields of peas grown for canning purposes at Laprairie, St. Johns and Napierreville. It was fairly prevalent in spots.

N. B. -

Slight but general occurrence. All varieties appeared to be about equally affected.

N. S. -

Moderate infection was reported in a garden at Kentville, N. S.

P. E. I. -

The disease was common in gardens at Charlottetown.

ROOT ROT - Fusarium spp.

A destructive root rot of canning peas occurred in the 3 counties, Laprairie, Napierreville and St. Johns, Que. Losses up to 90 per cent occurred in some fields. It is thought the disease is caused by Fusarium spp.

ROOT ROT - Pythium sp.

A root rot caused by a Pythium is reported as local in Moncton, N. B.

POWDERY MILDEW - Erysiphe Polygoni DC.

N. B. -

Powdery mildew occurred commonly, but the infection was light.

Pea.

P. E. I. -
It is reported as very common at Charlottetown.

POTATO

The observations on potato diseases here reported were obtained by the potato inspectors, during their examination of fields of potatoes grown from certified seed stock. As the various diseases must be kept down to very narrow limits for the seed to pass inspection, far greater effort is made to control them in certified stock than in the ordinary potatoes produced for table use. In consequence if any disease is reported as serious in certified seed, it is probably still more destructive in the general crop.

In 1929 about 6 per cent of the acreage devoted to potatoes in Canada was used for growing certified seed. In P. E. I. over 50 per cent of area in potatoes was inspected; in N. B. approximately 6 per cent; in B. C. over 2 per cent and in the other provinces the acreage averaged around 1 per cent. It is also worth noting that 70 per cent of the total acreage in certified seed potatoes is located in P. E. I.

Fields planted with certified seed failed to pass inspection for several reasons. Mosaic was responsible for 50 per cent of the total rejections. The disease was most prevalent in Green Mountain and Bliss Triumph. Black leg was second in importance being responsible for 8.5 per cent of the rejects. Leaf roll was third with 2.7 per cent. Fifteen and a half per cent were also rejected on account of being adjacent to diseased fields.

LATE BLIGHT - Phytophthora infestans (Mont.) de Bary.

Que. -
The weather was unusually wet during the summer in Quebec. As a result late blight reached epidemic proportions in the last few days of August and the first week of September. It then increased rapidly throughout the province. The losses from tuber rot were considerable.

N. B. -
Late blight caused a slight amount of damage in Restigouche county.

P. E. I. -
Late blight was present in very few instances. In one field where the crop had not been sprayed, 25 per cent of the tubers were infected when they were examined in the early autumn.

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

B. C. -
Rhizoctonia was common, but not severe in the Okanagan Valley. It was neither as prevalent nor severe as in previous years. It is suggested that the decrease was due to the soil being warmer and drier than usual.

Alta. -
The disease was common and caused the usual damage.

Ont. -
The sclerotia of Rhizoctonia were present in greater numbers than usual.

N. B. -
A moderate amount of Rhizoctonia was present in this province.

P. E. I. -
The disease was quite prevalent on the tubers. The vines died early and some time elapsed after their death before the tubers were harvested. This permitted a greater development of the sclerotia than usual.

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

Que. -
On account of the wet season early potatoes in the Sherrington region suffered considerable damage from early blight.

N. B. -
A slight infection from early blight developed in the southern part of the province.

P. E. I. -
Early blight was present only in isolated districts and there the infection was light. It would seem that this disease is not necessarily more prevalent in a dry season.

COMMON SCAB - Actinomyces scabies (Thax.) Güssow.

B. C. -
Common scab was distributed generally in the Okanagan Valley. The disease was slightly more prevalent than usual.

Alta. -
The disease was common and caused severe damage at several points in the province. Several of the larger lots of potatoes

awaiting certification had to be rejected on account of scab. The dry weather appeared to have favoured the disease.

Ont. -
The disease was more prevalent than usual, probably due to the dry weather.

N. B. -
In general common scab caused little damage, but here and there it was severe.

P. E. I. -
The disease was severe in many sections, particularly in those where mussel mud had been used.

MOSAIC - Virus disease.

B. C. -
Mosaic was less prevalent and less severe than in previous years. The symptoms of the disease may have been masked in part by dry weather.

Que. -
The disease appeared to be slightly on the increase.

N. B. -
Infection from mosaic varied from slight to severe. Eighty per cent of the fields that were rejected were refused certification on account of mosaic.

P. E. I. -
The disease was about as prevalent as it was in 1928.

LEAF ROLL - Virus disease.

B. C. -
Infection from leaf roll was limited and slight.

N. B. -
The disease was not as common as usual, infection being slight.

P. E. I. -
The amount of leaf roll was about the same as in 1928.

POWDERY SCAB - *Spongospora subterranea* (Wallr.) Lagerh.

N. B. -
Slight infections of powdery scab were reported from Restigouche and Gloucester counties.

P. E. I. -
Powdery scab was practically absent.

A tuber of Solanum ?tuberosum, which was found growing wild in the Desert of Les Leones, Mexico and sent to the Division of Botany showed a pustule of powdery scab.

BLACK LEG - Bacillus phytophthorus Appel.

B. C. -
Moderate infection from Black leg was found in the Kelowna district.

N. B. -
A slight amount of black leg was present. The disease was not as important as usual.

N. S. -
Black leg was found in abundance in fields of ordinary potatoes in Hastings township.

P. E. I. -
The damage from black leg was negligible.

DRY ROT - Fusarium spp.

Dry rot was present to a moderate extent in N. B. In a small lot of potatoes, which were mostly Green Mountains with a light red potato said to be Early Ohio mixed with them, it was noted that the Green Mountains were badly decayed while the red potatoes were practically free from rot.

FROST INJURY - Non-parasitic.

Ont. -
Heavy losses were experienced from early frosts at digging time, which resulted in still further losses in storage.

P. E. I. -
On account of inadequate storage facilities many growers suffered losses from frost. Either the tubers were frozen causing them to decay, or they were so chilled that net necrosis resulted rendering them unfit for seed purposes.

MISCELLANEOUS DISEASES

LACK OF VIGOUR -
In P. E. I. potatoes which were planted about June 1st were the most vigorous. Fields planted before or after that period failed to produce vigorous plants in several instances. The season was one of the driest on record and contributed materially to this condition. A similar condition was observed in Alberta.

Potato.

SPINDLING TUBER - Virus disease.
The disease was observed in some fields in B. C. A slight amount of spindling tuber occurred in N. B.

SHOE-STRING MOSAIC - Virus disease.
Two plants affected with shoe-string mosaic were observed in an acre field of Green Mountains in Trois Pistoles, Que. The seed had been obtained from P. E. I.

GIANT HILL - Virus disease.
The disease was observed in sone fields in B. C.

SEED PIECE ROT - Cause undetermined.
Experiments conducted in B. C. in 1929 tend to show that in low lying, wet, cold soils, cut tubers are more frequently rotted than whole potatoes, which results in a decrease in yield.

PHOMA ROT - Phoma tuberosa. Melh., Rosenb. & E.S. Schultz.
This rot follows powdery scab. A considerable amount of this disease has been observed in P. E. I.

ALTERNARIA ROT - Alternaria Solani (Ell. & Martin) Jones & Grout and A. fasciculata (Cooke & Ell.) Jones & Grout.
The disease occurred on a few tubers only at the Experimental Farm, Fredericton, N. B.

SILVER SCURF - Spondylocladium atrovirens Harz.
A moderate amount of infection was present.

NET NECROSIS - Cause unknown
A slight amount of net necrosis was reported in York county, N. B.

HOLLOW HEART - Non-parasitic.
A slight amount of the disease was present in oversize tubers of Bliss Triumphs in N. B.

FUSARIUM WILT - Fusarium oxysporum Schl.
The disease was quite common in uncertified stock. Up to 25 per cent of the plants were affected in fields in N. S.

VERTICILLIUM WILT - Verticillium albo-atrum Reinke & Berth.
A single plant found in York county, N. B.

RHUBARB

CROWN ROT - Cause undetermined.

Sask. -
A serious crown rot continues to be destructive in Saskatchewan.

Rhubarb.

At the Dom. Experimental Station, Rosthern, a new crop of rhubarb was set out; the new roots were obtained by cutting up roots taken from the old block. A large percentage of the new plants were dead from crown rot. It is thought that the disease was spread by cutting up diseased and healthy crowns with the same knife.

N. B. -
A crown rot is also reported from Fredericton. Several plants in one garden died from the disease.

LEAF SPOT - Phyllosticta straminella Bres.

Traces of this leaf spot were observed in P. E. I. It was present generally in Rosemount township, Que., but it caused no loss.

LEAF SPOT - Ascochyta Rhei Ell. & Ev.

This leaf spot was found in gardens at Charlottetown, P. E. I.

MOSAIC - Virus.

Observed in Queens county, P. E. I. The symptoms were very striking.

SALSIFY

WHITE RUST - Cystopus cubicus (Strauss) de Bary.
The disease was very severe on two 50 foot rows in Neuville township, Que.

SPINACH

DOWNY MILDEW - Peronospora effusa (Grev.) Rabh.

Que. -
Large fields of spinach were entirely destroyed. The loss was very heavy.

P. E. I. -
The disease was very scarce this year. It was found in only one garden.

SUGAR BEET

SCAB - Actinomyces scabies (Thax.) Güssow.
Specimens received from Armstrong, B. C., were severely affected.

Sugar Beet.

BLACK LEG - Phoma Betae (Oud.) Frank..
The disease was present on specimens from Armstrong, B. C.

ROOT ROT - Cause undetermined.
A root rot, the cause of which is unknown, was prevalent in the Raymond district, Alta.

HOLLOW HEART - Non-pathogenic.
Hollow heart was present on sugar beets received from Armstrong, B. C.

TOBACCO

BLACK ROOT ROT - Thielavia basicola Zopp.

Que. -
Although this disease is quite general in the tobacco districts the damage was less than in 1928.

Ont. -
The damage was less than usual due to the hot dry mid-summer. The Dark and Burley varieties, which are grown on the heavier soils were most seriously affected. Practically no black root was observed in the Norfolk section.

WILDFIRE - Pseudomonas Tabacum (Wolfe & Foster) Stev.

Shortly after transplanting, an outbreak of wild fire occurred in Yamaska Valley, Que. The disease was checked by the drought and very little damage resulted. No wild fire was observed in Ont. or B. C.

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

Que. -
Tobacco of the Belge variety seemed more seriously affected than any other grown in Que. Very little damage was done to the cigar tobacco.

Ont. -
Infection by angular leaf spot was only about one third as heavy as it was in 1928.

MOSAIC - Virus.

Damage from mosaic was very slight throughout all the tobacco districts, except in B. C.

DAMPING-OFF - Pythium de Baryanum Hesse.

Damping-off was very common in a section north of the

St. Lawrence River, Que. due to heavy watering and insufficient ventilation of the seed beds.

NUTRITIONAL DISTURBANCES

No cases of sand drown, drought spot or potash starvation were noted.

MISCELLANEOUS DISEASES.

Ont. -
No frenching, curly dwarf, sore skin, hollow stalk or leaf drop were observed.

Que. -
Only a few isolated cases of frenching, hollow stalk brown root rot were noted.

B. C. -
Leaf drop was observed again in the Okanagan Valley.

TOMATO

YELLOWS - Virus disease.

Yellows was more prevalent than it has been in previous years in the Okanagan Valley, B. C. Although it is present every year, it rarely produces any severe losses.

MOSAIC - Virus disease.

B. C. -
The disease was found on plants in the greenhouse and the field in the Okanagan Valley, but in all cases infection was very light.

N. B. -
Mosaic was widespread, but infection was very light,

P. E. I. -
Mosaic was observed twice. Very slight amount was present in either case.

LEAF SPOT - Septoria Lycopersici Speg.

Ont. -
Plants of Chalk's Jewel showed slight infection at Burlington and Bronte at the time they were being set out where they had not been sprayed. Infection was still light on July 1.

Tomato.

N. B. -
Infection was light and infrequent.

P. E. I. -
Moderate infection occurred in the experimental plots at Charlottetown.

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

Que. -
Early blight was present in Laval and Deux Montagnes counties. It also occurred on the fruit at Macdonald College where it caused a semi-dry, black rot of the calyx-end of the fruit.

P. E. I. -
The varieties, which are grown commonly in the city gardens at Charlottetown, were moderately infected.

BLOSSOM END ROT - Non-parasitic.

B. C. -
The disease was general and more severe than in previous years in the Okanagan Valley.

Sask. -
Blossom-end rot was very severe on tomatoes late in the season at Indian Head though there was very little earlier. Variety Pink was most severely affected, 80 to 90 per cent of the fruit being rotted. This disease was also common and severe about Saskatoon.

Ont. -
Specimens were sent in from Almonte.

Que. -
Blossom-end rot caused a loss of 60 per cent in a garden of about 100 plants at St. Gregoire. The soil appeared to lack in fertility and in humus content. The weather was very dry.

N. S. -
The disease was present in a truck garden at Kentville, N.S.

VERTICILLIUM WILT - Verticillium albo-atrum Reinke & Berth.

About 10 per cent of tomatoes in two large greenhouses in Lincoln county, Ont. were infected. V. albo-atrum was isolated consistently.

Tomato.

BREAKDOWN - Non-parasitic.

During the past season breakdown was again found at Keremos, B.C. in practically all the fields. The disease however was not extensive and losses from it were negligible. A survey of the Okanagan Valley showed that a small percentage of breakdown occurred in all the tomato-growing districts. The disease was less severe than in 1928.

LEAF MOULD - Cladosporium fulvum Cke.

This disease appeared again in some of the greenhouses in the Okanagan Valley, B.C. and it caused a small amount of damage.

TURNIP

STEM AND ROOT ROT - Sclerotinia Sclerotiorum (Lib.) de Bary.

Stecklings were severely girdled by this fungus at Kentville, N. S. Ordinarily the disease is of no consequence. It also caused some decay of turnips in storage at Nappan.

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

N. B. -

A slight, general infection of the turnips at the Experimental Station, Fredericton, was observed.

P. E. I. -

This disease caused the destruction of many thousands of bushels of turnips in storage. They break down very rapidly where ventilation is poor (For a description of the disease see Lauritzen, J.I. Rhizoctonia rot of turnips in storage. Jour. Agr. Res. 38: 93-108. 1929).

DRY ROT AND CANKER - Phoma Lingam (Tode) Desm.

This disease was serious in some varieties of swedes at Kentville, N.S. The disease appears to be carried on the seed. However, the fungus apparently lives over also in the soil on the remains of diseased plants.

SOFT ROT - Bacillus carotovorus L.R. Jones.

One per cent of the plants in the variety Bangholms was affected with soft rot at Charlottetown, P. E. I.

CLUB ROOT - Plasmodiophora Brassicae Woron.

Que. -

In a field at New Richmond about 25 per cent of the plants

Turnip

were infected. The disease was also reported from Acton Vale.

N. B. -

Infection from club root was fairly general in all infected soils. Few varieties appear to be immune.

N. S. -

About 5 per cent of the crop in one field in Great Village township were seriously affected with club root. At Princeport another field showed 25 per cent.

P. E. I. -

The disease was observed on all commercial varieties except Bangholms at Charlottetown. Club root is quite common where the land has not been "mudded".

WHITE RUST - Cystopus candidus (Pers.) de Bary.

White rust was observed on a few occasions.

WATERMELON

LEAF SPOT - Cercospora sp.

Slight infection observed in Sunbury county, N. B.

DISEASES OF FRUIT CROPS.

APPLE

SCAB - Venturia inaequalis (Cke.) Wint.

B. C. -

In the Kootenay Lake area observations were made on the percentage of fruit infected on unsprayed trees. The results were as follows:-

Gravenstein	76.7	per cent scabby
Northern Spy	64.6	" " "
McIntosh	98.7	" " "

Ascopores were found on spore traps on May 1st and they continued to be discharged intermittently for a period of 39 days when observations were discontinued, conidia then being plentiful. (J.W. Eastham).

In the Okanagan Valley the commercial loss from scab was negligible. The disease is confined almost entirely to the northern sections of the Valley.

Man. -

Only a trace of apple scab was found at the Horticultural Station, Morden. The disease is sometimes fairly common, but no spraying is done to control it.

Ont. -

Apple scab was of considerably less importance than in the previous year. Although the infection was general the season was unfavourable and where the present programme of spraying was carried out the disease was held in check. In the experimental orchard of young trees at St. Catharines the percentage of foliage infection on the unsprayed trees on Sept. 19th was 3 to 24 per cent, while on the sprayed trees infection ranged from ½ to 9 per cent. Infection was first observed on May 13 in Lincoln county. It made its first appearance on the leaves in York, Peel and Walton counties on May 19, and on the fruit (McIntosh) on May 25. Forty per cent of the leaves on unsprayed trees were badly disfigured by scab at Guelph by June 18. In general dry weather in June held the disease in check.

Que. -

In the 20 to 25 orchards visited in the Mount St. Hilaire district 5 to 10 per cent of the fruits were scabby, infection being light, in well sprayed orchards. On the other hand 90 to 100 per cent of the fruits were scabby, being lightly or severely infected, in a few unsprayed orchards. In poorly sprayed orchards the figures ranged between these two extremes.

Apple.

Average infection for all Fameuse and McIntosh apples in this district would be about 50 to 60 per cent.

At.Ste. Anne de la Pocatière observations were made on varietal susceptibility. In Fameuse 80 per cent of the fruit were infected, in McIntosh 90 per cent, in Wealthy 55 per cent, and in Duchess 10 per cent. Average infection of all varieties was 55-60 per cent.

The disease was very prevalent in unsprayed orchards along the south shore of the St. Lawrence River in the Montreal region. It was less abundant on the north shore.

N. B. -

Scab was fairly prevalent in unsprayed orchards, but it was of less importance than it has been in the past few years.

N. S. -

Apple scab caused moderate infection on all varieties except Baldwin and Greening, on which severe infection of storage spot developed. In many orchards spray applied between July 15 to 31 prevented the development of storage spot. Scab was found to be general on leaf and fruit in several small farm orchards where the trees were not cared for. The fruit was small and cracked.

P. E. I. -

Apple scab was widespread and, except in a few orchards where they were faithfully sprayed, the apples were unsaleable.

FIRE BLIGHT - Bacillus amylovorus (Burr.) Trev.

B. C. -

Fire blight was not as severe as in 1928 in the Okanagan Valley although conditions were ideal for its spread. It is thought that control measures carried out by the growers was largely responsible for its decrease.

Man. -

Of the diseases of apple, which occur on the Horticultural Station at Morden, fire blight is the most destructive. It was not very abundant or destructive this year. Prince and Yellow Transparent were the most susceptible of the varieties grown. Bad cankers occurred on these varieties. In several others spur blight was considerable. In still other varieties no blight was seen. Large cankers only are removed; the small diseased twigs are allowed to remain. Considerable fire blight also occurred at the Agricultural College, Winnipeg.

Ont. -

Fire blight was very bad on some varieties of apples, especially Kings, in Kent and Essex counties. Considerable

loss of fruit resulted.

Que. -

Very heavy damage from Fire blight was reported in Montreal district, chiefly on Alexander. The disease was found to be prevalent on two or three varieties at Abbotsford. About 25 to 30 twigs per tree were blighted and about 250-300 trees were affected. Minor outbreaks were reported from several other parts of the province.

P. E. I. -

The disease is quite serious in uncared for orchards. Ornamental mountain ash trees at Charlottetown were also affected with fire blight.

BLACK ROT - Physalospora Malorum Shear.

Que. -

The disease was prevalent on some trees of Alexander at Abbotsford, Mt. Johnson and Hemmingford.

N. B. -

Black Rot occurred only slightly in York county. Infections on both fruit and leaves were observed.

N. S. -

The disease was scattered to general in small farm orchards in Pictou and Colchester counties.

PERENNIAL CANKER - Gloeosporium perennans Zeller & Childs.

A survey conducted in the winter 1928-29 showed that perennial canker was established in the Penticton, Summerland, Kaleden and Keremeos districts, B. C. Control measures recommended last spring have kept the disease in check.

M I S C E L L A N E O U S D I S E A S E S

PINK ROT - Trichothecium roseum Link.

Pink rot caused considerable damage where the fruit was scabby in P. E. I. It was of slight occurrence in storage in York county, N. B.

ANTHRACNOSE - Neofabraea malicorticis (Cordley) Jackson

This disease is practically confined to the Salmon Arm district, B. C. Climatic conditions last fall were unfavourable for any serious increase of infection.

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

A light infection of powdery mildew occurred in every

Apple

district in the Okanagan Valley, B. C. It caused a slight reduction in grade owing to the russetting of the fruit.

BITTER PIT - Non-parasitic.

Bitter pit was not as prevalent as last year in B. C. It was limited almost entirely to Northern Spy. Considerable bitter pit showed up in storage in N. S. on Baldwin, Northern Spy, Greening and Stark.

CROWN ROT - Cause not known.

This disease is causing an increasing loss of trees in all irrigated sections of the Okanagan Valley, B. C.

WINTER INJURY - Non-parasitic.

Although the winter was more severe than usual very little noticeable injury was observed in the Okanagan Valley, B. C. Winter injury was also reported from Charlesbourg, Que., in a young orchard with sod cover exposed to prevailing west winds. Little new growth was made, the trees were stunted and bushy with light-green leaves.

INTERNAL BREAKDOWN - Non-parasitic.

Although internal breakdown was still general and serious especially in Jonathan in the Okanagan Valley, B. C., there was a marked decrease in loss of fruit in 1929. Internal breakdown was also found in many varieties in N. S. It was thought that the outbreak was due to the drought of the past summer.

DROUGHT SPOT, DIE-BACK and CORKY CORE - Non-parasitic.

These three diseases are evidently on the increase in Okanagan Valley, B. C. The loss in fruit from these diseases in 1929 was much greater than the combined losses from all other diseases.

Corky core was also observed in Wageners in N. S. The surface of the fruit was somewhat wrinkled resembling aphis apples.

JONATHAN SPOT - Non-parasitic.

A small amount of Jonathan spot was observed at the Experimental Farm, Fredericton, N. B. in March. The disease is not common.

Apple

EUROPEAN CANKER - Nectria galligena Bres.

This canker was observed to a limited extent in Restigouche county, N. B. on Fameuse.

TWIG BLIGHT - Nectria cinnabarina (Tode) Fr.

This fungus was found constantly on Ben Davis, Gano and Rome Beauty twigs in N. S. It caused a die-back from the fruit spurs. The fungus apparently gained entrance through old apple stems which had remained attached to the fruiting spurs.

SILVER LEAF - Stereum purpureum Fr.

Only three trees were found affected with silver leaf in the main orchard, Horticultural Station, Morden, Man. Two of these trees were, however, dying from the disease. The disease was also reported from Nappan, N. S. and York county, N. B.

BLUE MOULD - Penicillium expansum Thom.

This mould is reported to have caused a small loss in storage in N. B.

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

This rot was of slight occurrence in N. B. It was also of no importance in the Niagara peninsula in Ontario.

FRUIT SPOT - Phoma pomi Pass.

A slight amount of fruit spot occurred in N. B.

STIPPIN - Non-parasitic.

This disease was common on many varieties in N. B.

APRICOT

RUSSETING - Non-parasitic.

Russeting was prevalent in all parts of the Okanagan Valley, B.C. and is decidedly on the increase. It would appear that the disease is closely related to drought spot of apple.

BLACKBERRY

ORANGE RUST - Gymnoconia Peckiana (Howe) Trotter

Ont. -

The rust was common on both cultivated and wild varieties

Blackberry

in Halton, Peel and York counties.

Que. -
The disease was locally serious in the Abbotsford district.

N. S. -
In one plantation of the Snyder variety in King's county 2 to 3 per cent of the plants were affected. Specimens of the rust on the same variety were received from Annapolis county.

CHERRY

SHOT HOLE - Coccomyces hiemalis Higgins
(Cylindrosporium hiemalis Higgins)

Ont. -
Fifty per cent of the leaf surface was destroyed by June 3, in Halton and Peel counties on sweet cherries (mostly Windsors) where the trees had not been sprayed or where the spraying was poorly done. The disease was also bad in the previous two years in Kent and Essex counties. Premature defoliation by this disease along with some unusually cold weather in the winter resulted in the death of many sour cherry trees. In the Niagara peninsula the disease was of no importance in 1929 although it had been serious the two previous seasons.

N. B. -
A moderate amount of shot hole was present in York county.

N. S. -
The disease was very prevalent on sour cherry trees that had not been sprayed, causing 25 per cent of the leaves to fall. It was well controlled on sprayed trees.

P. E. I. -
Shot hole caused considerable defoliation. The trees are not sprayed.

DROUGHT SPOT - Non-parasitic.

Drought spot of cherry was observed in the Okanagan Valley, B. C., but it is of minor importance. The disease was neither widespread nor severe.

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

One case of witches' broom was observed at Maguerville, N.B.

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

Brown rot in sweet cherries caused considerable loss in 1928 in Kootenay Lake area, B. C. It was not found in 1929.

At the Horticultural Station, Vineland, Ont., the disease was relatively scarce and unimportant this year. In many cases over-ripe fruit remained on the trees for as long as 2 weeks with very little infection developing.

The fruit from 3 large trees of wild black cherry (Prunus serotina) was a total loss due to brown rot at St. Etienne des Grès, Que.

CURRANT

WHITE PINE BLISTER RUST - Cronatrium ribicola Fischer.

Ont. -

The rust was less abundant than usual in York, Wellington, Peel and Halton counties.

Que. -

The rust was reported on black currants from Oka and Mascouche.

N. B. -

The disease was severe on currants at the Experimental Farm, Fredericton.

N. S. -

All the bushes in small garden plantations in Pictou and Colchester counties, where observations were made, were severely infected. Considerable defoliation resulted. Also reported from Inverness county.

P. E. I. -

The rust was general wherever currants were cultivated. The disease is also common now on white pine.

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

Ont. -

The disease was very common in spite of dry weather in Wellington, York, Peel and Halton counties.

N. S. -

Practically all leaves on bushes in a small garden at Middle Stewiacke were infected.

P. E. I. -
Currants were moderately infected, with this leaf spot wherever they are cultivated.

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

Ont. -
Septoria leaf spot was very common in Wellington, York, Peel and Halton counties although the weather was dry.

P. E. I. -
This disease was very common on cultivated currants at the Experimental Farm.

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

A slight amount of powdery mildew occurred on currants in York county, N. B.

GOOSEBERRY

WHITE PINE BLISTER RUST - Cronartium ribicole Fisch.

It was reported that the disease had been noticed for several years on cultivated gooseberries at Wakeham, Gaspé Co., Que.
Severe infection occurred on bushes within 100 yards of infected pines at Peterville, N. B.
Scattered infection occurred on all bushes in a garden at Middle Stewiacke, N. S.

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

Specimens affected with powdery mildew were submitted from Ste. Theodosie, Que.
Slight infection of this disease occurred in York county, N. B.

CLUSTER CUP RUST - Puccinia Pringsheimiana Kleb.

A fairly heavy infection was seen in the University garden, Saskatoon, Sask.
The fruits were found infected to a considerable extent at Annapolis, N. S. Leaf infections were also noticed on both wild and cultivated species on several occasions.

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

A slight infection of this leaf spot was reported from York county, N. B.

Gooseberry

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

Septoria leaf spot was common in the gardens of Charlottetown, P. E. I.

GRAPE

POWDERY MILDEW - Uncinula necator (Schw.) Burr.

This disease was of little significance in the Niagara peninsula, due no doubt, to the extremely dry weather. A heavy infection was observed in one vineyard of Concords bordering on Lake Ontario, where heavy fogs had prevailed and the vines had not been sprayed.

A trace of this disease was observed at Kentville, N. S.

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

Downy mildew was similarly of little importance in the Niagara peninsula, due to the dry weather.

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

The disease appeared to be more abundant than usual in the Niagara peninsula. This may have been due to the excessive moisture of early spring followed by a sudden change to dry weather, which seemed to exaggerate leaf symptoms. In a vineyard in Pelham township 5 per cent of the vines showed dead arm.

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

In a vineyard at Beamsville, Ont., a general but light infection was observed, about 8 to 10 per cent of the fruit being affected.

PEACH

LEAF CURL - Taphrina deformans (Berk.) Tul.

B. C. -

Where the trees were sprayed the disease was found of no importance in the Okanagan Valley.

Ont. -

Leaf curl was unusually prevalent and severe. Complete defoliation was not uncommon. The Ont. Spray Service Records

Peach

showed that the disease was very serious in orchards which were sprayed later than Apr. 11 or thereabouts. In many instances spray had not been applied as it was impossible to get on the land by that date. The disease also was prevalent in Halton and Peel counties and about London.

SCAB - Cladosporium carpophilum Thüm.

Scab was of much less importance than in the previous two seasons in the Niagara peninsula of Ontario. Infection appeared late and although the fruit developed some scab little became deformed and cracked. In a Jordan orchard scab was very serious on St. Johns. Although the trees had been sprayed twice they were in a very sheltered location. Alberta was much less heavily attacked. Infection was general but light on Admiral Dewey and St. John in another orchard at the same place. The trees had been sprayed twice, but the orchard was in a sheltered location.

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

Apothecia were found abundantly developed in an uncultivated peach orchard on May 24 at Vineland, Ont. The disease was of no importance either as blossom blight or a fruit rot in the Niagara peninsula. The dry weather apparently held the disease in check.

DROUGHT SPOT - Non-parasitic.

This disease was severe in only a few orchards in the Okanagan Valley, B. C.

PEAR

SCAB - Venturia pirina Aderh. (Fusicladium pirinum (Lib.) Fuck.)

Ont. -

In an orchard at Beamsville 60 per cent of the fruit of Flemish Beauty were infected, while fully 15 per cent were not marketable. These trees had been sprayed at least 3 times, while adjoining rows of Bartletts, which had been sprayed twice (dormant and calyx), were clean.

Que. -

Scab was found everywhere south of Montreal. Even where the trees had been sprayed there was a high percentage of infection at Covey Hill, Franklin Centre and Abbotsford.

P. E. I. -

Trees were moderately infected at Charlottetown.

FIRE BLIGHT - Bacillus amylovorus (Burr.) Trev.

B. C. -
Fire blight was general throughout the Okanagan Valley, but the disease has been kept under control and serious losses have been prevented.

Ont. -
Fire blight was of no importance in the Niagara peninsula.

Que. -
The disease was of little importance. It was observed at Abbotsford and Franklin Centre.

P. E. I. -
It was observed in one orchard near Charlottetown.

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

The disease was not as severe as it has been in past seasons, in the Okanagan Valley, B. C.

DROUGHT SPOT - Non-parasitic.

Drought spot was prevalent and fairly severe in all parts of the Okanagan Valley, B. C. It appears to be increasing on younger pear trees where poor drainage conditions have resulted from irrigation on heavier soil types.

BLOSSOM-END ROT - Cause unknown.

The disease was slightly more prevalent in several districts of the Okanagan Valley, B. C.

PLUM

PLUM POCKETS - Taphrina Pruni (Fuck.) Tul.

Sask. -
Approximately 10 per cent of fruit were destroyed in the orchard at the Experimental Farm, Indian Head.

Man. -
Plum pockets is confined to the native selections of Prunus nigra and P. americana at Horticultural Station, Morden, Man. Probably most of the selections are of the latter species. Ten per cent of the fruit were affected. Spray has never been applied. At the Agricultural College, Winnipeg, 5 to 10 per cent of the fruit were affected on the native selections. The disease was epidemic in 1927 when spraying was omitted. The disease has been well controlled by spraying.

Plum

Ont. -
Specimens of plum pockets from cultivated plums were received from Britannia and North Bay.

Que. -
Although the disease was observed at Abbotsford it appears to be worse in eastern Que. The fruit was a total loss in small gardens at St. Sulpice and St. Etienne des Grès. Sixty to seventy-five per cent of the fruits on wild plums in Ste. Genevieve were destroyed by plum pockets.

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

Sask. -
From observations made at Dana, where choke-cherry (Prunus virginiana) and pin cherry (P. pennsylvanica) were found growing together, it appears that choke-cherry is much more susceptible than the other host. The galls on the former were more abundant, much larger, and they frequently occurred on the main shoots or larger branches, killing that portion above the knot. Black knot on pin cherry is rather difficult to find and the knots are confined to the smaller twigs. The disease was also common on choke cherry at St. Gregor and Humboldt.

Man. -
At Morden, Man. black knot was found to produce numerous large galls on the May Day tree (Prunus Padus var. commutata) At.Winnipeg it was noted that the choke cherry was much more severely affected than the native plum.

Ont. -
Black knot was quite general throughout the Niagara peninsula. Lombard was commonly affected. The disease is common in unsprayed orchards in the mixed farming districts of York, Halton and Peel counties. Few trees are affected in the fruit sections.
It was also collected on choke cherry at Rainy River.

Que. -
Black knot apparently killed plum trees at Ste. Genevieve. It was also observed at St. Hilaire and Lacelle.

N. B. -
The disease was reported to occur to some extent. Pin cherry was found to be slightly infected.

P. E. I. -
The disease was very common all over the province and it has been responsible for the complete destruction of excellent orchards.

Plum

In view of the differences of susceptibility of the above hosts it is of interest to note their systematic position. According to Rehder (Manual of cultivated trees and shrubs), they may be classified as follows:-

Subgenus Prunophora, section Euprunus - Prunus domestica, some varieties very susceptible; section Prunocerassus-P. nigra and P. americana slightly susceptible; Subgenus Cerasus, section Mahalab - P. pennsylvanica slightly susceptible. Subgenus Padus-P. Padus var commutate and P. virginiana very susceptible. Physiologic specialization has also been reported.

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

Ont. -

No importance in 1929 in the Niagara peninsula.

N. B. -

Moderate amount of brown rot occurred in York county.

P. E. I. -

Brown rot did considerable damage. It was found in all unsprayed orchards.

SCAB - Cladosporium carpophilum Thüm.

Scab was reported as common in Carleton county, N. B.

Raspberry

MOSAIC and LEAF ROLL - Virus diseases.

B. C. -

Mosaic was general in the Okanagan Valley.

Ont. -

Mosaic appeared to be very common on wild raspberries in Halton, Peel and York counties. Many plantations of cultivated raspberries are free from mosaic, while others show 8 to 10 per cent of the plants infected. Mosaic has never been seen on Viking. (W.G. Evans).

In the Niagara peninsula the prevalence of mosaic and leaf roll remains about the same as in previous seasons. They are commonly found in commercial plantations. At Beamsville in an half acre planting of Herberts about 6 years old and never rogued, 50 per cent of the plants were affected with mosaic and 5 per cent with leaf roll. The yield was already unprofitable and the planting must be replaced.

N. B. -

Mosaic is fairly prevalent, while leaf curl is common on both cultivated and wild varieties.

Raspberry

N. S. -
In a planting of Viking at Kentville, 10 per cent of the plants were infected with mosaic. Adjacent Herberts were free from the disease. Viking is apparently extremely susceptible under local conditions.

P. E. I. -
Mosaic occurred in all plantations irrespective of variety. Viking was only slightly susceptible. Leaf roll was reported from all parts of the province. It was not observed on Viking.

SPUR BLIGHT - Didymella applanata (Niessl.) Sacc.

The fungus causing spur blight in North America has usually been referred to as Mycosphaerella rubina (Pk), but Koch has recently shown that it is identical with Didymella applanata, the cause of spur blight in Europe, and the American name should be reduced to synonomy.

Ont. -
Spur blight is very common in Wellington, Peel, Halton and York counties where raspberries are grown in the mixed farming area, all varieties seem to be equally affected.
In the Niagara peninsula there was only about half as much spur blight as in the previous year, when it was exceptionally bad.

Que. -
The ascigerous stage was found on May 26 in a planting in Jacques Cartier county on cankered areas at the base of blighted spurs of two year old canes. (J.E. Machacek).

N. B. -
Spur blight was present to a slight extent.

N. S. -
Some severe infections of spur blight were observed in plantations at Greenwick. Canes were completely girdled near the base.

P. E. I. -
Spur blight was general over the province. It has been responsible for complete destruction of many plantations. Herberts were found badly diseased, while no spur blight was found on Viking.

ANTHRACNOSE - Plectodiscella veneta Burk.

Que. -
Anthracnose was reported as serious in some plantations in Jacques Cartier county.

N. B. -
A small amount of anthracnose was present in York county.

N. S. -
The disease was fairly common in King and Annapolis counties. New infections were showing abundantly on young canes causing considerable cankering of the canes.

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

Que. -
The leaf spot caused by the imperfect stage was serious on Herbert at Bedford.

N. S. -
Septoria Rubi was common on the leaves at Digby. Rhabdospora Rubi was found fruiting abundantly on adjacent blighted canes. This is the first report of the latter fungus for Nova Scotia. Whether these two fungi are indentical, as claimed, is not known.

P. E. I. -
Traces of the leaf spot were observed on wild raspberries.

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

Ont. -
Canes bearing the perthecia were numerous in nearly all plantations in Halton, Peel and York counties. Even some of the best growers have not succeeded in cutting it all out. In neglected plantations 50 per cent or more of the canes are diseased.

N. B. -
The disease was present to a slight extent at Moncton.

N. S. -
Cane blight was more prevalent than usual in Kings and Annapolis counties. Considerable blight was found on old fruit canes.

ORANGE RUST - Gymnoconia interstialis (Schl.) Lagerh.

The rust was quite prevalent on wild raspberries in N. B. It was also observed at several places in N. S. and Que.

BLUE STRIPE WILT - Verticillium ovatum Berkeley & Jackson.

In a half-acre plantation in Welland county, Ont. 3 per cent of the plants were affected. Raspberries had been planted following potatoes, and tomatoes were grown as an interplanted crop.

Raspberry.

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

Twenty-five per cent of plants rogued from a nursery plantation for mosaic also were infected with crown gall.

ASCOSPORA CANE SPOT - Ascospora Rubi Zeller.

The Coryneum stage of this fungus was found readily in a plantation at Digby, N. S. It was associated with cane blight and may have contributed to the loss in many plantings. This is the first report of this disease in Nova Scotia.

ROOT ROT - Fusarium sp.

A rot caused by a species of Fusarium was found in a few black raspberry plants in gardens in the southern part of the Okanagan Valley, B. C.

SAND CHERRY

POWDERY MILDEW - Podosphaera Oxycanthae (DC.) de Bary.

Rather heavy infection of some of the bushes in the University garden, Saskatoon, Sask. Mature perithecia were present on Sept. 29.

STRAWBERRY

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

Ont. -
Leaf spot was not as common as usual in Halton, Peel and York counties.

Que. -
The disease was general in the Montreal district.

N. B. -
Leaf spot was present to some extent in York county.

P. E. I. -
The disease was not common this year. Moderate infection of Portia and Premier varieties was observed.

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

N. B. -
Leaf scorch was fairly prevalent, but it is apparently

of little economic importance.

P. E. I. -
The disease was abundant on S.L. Champion, Charles First and Portia. It was not observed on other varieties.

ROOT-ROT - Cause undetermined.

Ont. -
Root rot was quite general and severe in some plantations of the Niagara peninsula. At Vineland in a planting of Parson's Beauty composed of six rows each about 100 ft. in length, 60 per cent of the plants died completely after making a very vigorous growth and beginning to run. The plants had been carefully selected from a healthy patch in the spring.

The disease did not appear to be as bad as usual in Peel, Halton and York counties. It is thought that the long, cool, wet spring and the absence of heavy frosts gave the plants a better chance to recover from the winter. There were a few dead plants at fruiting time.

N. B. -
Root rot was reported as prevalent over the entire province.

POWDERY MILDEW - Sphaerotheca Humuli (DC.) Burr.

Ont. -
In the counties of Halton and Peel, powdery mildew caused very little damage in comparison with 1928. In that year Premier seemed to be less susceptible than Glen Mary.

N. B. -
A slight infection of powdery mildew occurred.

FRUIT ROT - Botrytis sp.

N. B. -
Infection from fruit rot was very slight.

P. E. I. -
Traces of rot were found on Senator Dunlop at the Experimental Farm, Charlottetown.

MOSAIC - Virus disease.

Ont. -
Sixty per cent of the plants were yellow and dying in one planting of Van Dyke in Lincoln county.

N. S. -
In a plantation in Colchester Co. the leaves were badly curled and mottled and the fruit was badly dwarfed.

DISEASES OF FOREST AND SHADE TREES.

ALDER (Alnus)

CATKIN DEFORMATION - Taphrina Alni-incanae (Kühn) Magn.
Very common on swamp alders in P. E. I.

BALSAM FIR (Abies balsamea)

NEEDLE BLIGHT - Asterina nuda Peck.
Moderate to severe infections in York county, N. B. Disease specimens were received from Sault Ste. Marie, Ont. Identified by Dr. Dearness.

NEEDLE BLIGHT - Sclerophoma sp.
Slight infection in York county, N. B.

WITCHES' BROOM RUST - Melampsorella elatina (Alb. & Schw.) Arth.
Reported from Highbury, N. S.

BUTT ROT - Polyporus Schweinitzii Fr.
General but slight infection in New Brunswick.

BEECH (Fagus)

WOOD ROT - Fomes fomentarius Fr.
Reported as uncommon in P. E. I.

BIRCH (Betula)

SAPWOOD ROT - Polyporus betulinus Fr.
Common in New Brunswick and Prince Edward Island.

HEART ROT - Fomes igniarius Fr.
Caused considerable damage in second growth birch.

BUTTERNUT (Juglans)

ANTHRACNOSE - Gnomonia leptostyla (Fr.) Ces. & de Not.
Moderate infection occurred on a number of trees at Maguerville, N. B.

CONIFERS

DAMPING OFF - Cause undetermined.
Damping off has proved troublesome on conifers at Rosthern, Sask.

ELM (Ulmus)

LEAF SPOT - Gnomonia ulmea (Sacc.) Thüm.
The disease is present in various localities in N. B. but infection is slight. Not common in P. E. I. The disease

was very noticeable in the Eastern Townships and west of Montreal, Que.

ROT - Pleurotus ulmarius Bull.
Observed once on elm in Prince Edward Island.

CANKER - Nectria cinnabarina (Tode) Fr.
Considerable damage was done to elms at Charlottetown, P. E. I.

HORSE CHESTNUT (Aesculus)

LEAF BLOTCH - Guignardia Aesculi (Pk.) V.B. Stewart.
Only isolated specimens were observed in New Brunswick. The disease was general over Prince Edward Island and caused partial defoliation.

LEAF SPOT - Phyllosticta sphaeropsoidea Ell. & Ev.
Reported from Ottawa, Ont.

MAPLE (Acer)

DIE BACK - Sphaeropsis albescens Ell. & Ev.
The whole top of a box elder (A. Negundo) was killed back a 2 to 3 feet at Saskatoon, Sask., and the bark of the dead shoots bore pycnidia in abundance. Fungus identified by Dr. Dearness.

LEAF SPOT - Phyllisticta minima (Berk. & Curt.) Ell. & Ev.
A trace of this leaf spot was observed on sugar maple (A. saccharum) in P. E. I.

HEART ROT - Fomes igniarius Fr.
Isolated trees of sugar maple were affected in N. B.

ANTHRACNOSE - Gloeosporium apocryptum Ell. & Ev.
It caused conspicuous disfiguration on the foliage of the ornamental and shade trees (A. platanoides) around a city residence (J. Dearness). It is also reported on sugar maple from P. E. I.

WILT - Verticillium sp.
Wilt was quite prevalent on maple at Coverdale, N. B.

MOUNTAIN ASH (Sorbus)

CANKER - Cytospora chrysosperma (Pers.) Fr.
The disease was observed in York county, N. B. and an affected specimen was received from Quebec City, Que.

PINE - (Pinus).

RUST - Cronartium Comptonae Arth.

Slight infection was present on young trees of jack pine in Sussex, N. B.

STEM CANKER - Ceuthospora sp.

A stem canker caused by Ceuthospora sp. was present on jack pine in York county, N. B. and in the Ottawa Valley in Quebec.

WHITE PINE BLISTER RUST - Cronartium ribicola Fisch.

A brief account of the places where blister rust was found on white pines or on wild Ribes, is here given. These records were obtained from short surveys made by members of the Dominion Laboratories of Plant Pathology or from correspondents, who submitted specimens to the Division of Botany for identification. For the prevalence of rust on cultivated currants see page 49.

Ont.-

A survey for white pine blister rust was conducted in Lincoln county by G. O. Madden. Six of the twenty-eight pine lots visited were found infected with blister rust. These were situated as follows, Ridgeville 2, Fonthill 2, Four Mile Creek 1, and Ball's Falls, near Vineland 1. At all these places the disease was also found on wild currants and gooseberries near infected pines. At the time the survey was made the rust was beginning to appear on cultivated currants, but no effort was made to learn the distribution of the disease on pine from examination of the alternate host. In addition infected pines were received from Renfrew County.

Que.-

Infected pines were received or reported from several places in Quebec with additional comments in many instances as follows:-

Macdonald College - The rust had been found for several years upon Ribes at the college, but this was the first time it was observed in the vicinity on pines. The disease was also abundant on wild currants in the woods.

Lachute - 300 trees have been found infected and removed from an extensive plantation. The Ribes are now being eradicated.

Lakefield - 35 per cent of the trees in a year old plantation were infected with blister rust. Many of the infections were on the main trunk.

Berthier - A few infections have been observed.

Pointe du Lac - Rust has been collected at this place.

Perthius Seigneury - Rust was present.

Lacharite - Twelve four-year-old trees were killed by blister rust.

Kirks Ferry - A tree 6 to 8 feet high was killed by rust.

St. Aubert - About 25 per cent of trees from 1 to 4 inches in diameter were attacked. These trees were located on two rocky hills east of St. Aubert.

Ste. Louise - Rust was found on pines near this place.

Ste. Ouesime - About 50 per cent of the trees near St. Ouesime were found attacked with rust.

Ste. Lucie de Doncaster, Grand Mere and Lac Brule near St. Agathe. Specimens of the rust on Ribes was also sent from Lac Marois.

N. B. -

A survey trip for white pine blister rust was made through York, Sunbury and Queens counties. Rust was found only at Petersville, where several trees were found infested. The disease was present, however, on wild and cultivated currants in all the three counties. The rust has also been collected on pines at St. Andrews.

N. S. -

As the result of a survey in Nova Scotia, white pine blister rust was found at five places in Kings county, two in Annapolis, four in Colchester and one in Antigonish. In addition rust was found on Ribes at two places in Cumberland County, one in Pictou, one in Cape Breton and two additional places in Colchester.

In addition it was reported that the rust was becoming serious on pine about Kentville. Rust was also observed in considerable abundance on white pine at one place in Pictou county. Black currants near by were badly infected.

P. E. I. -

White pine blister rust was reported as destructive in Queens county.

NEEDLE BLIGHT - Lophiodermium brachysporum Rostr.

A slight amount of needle blight of white pine was observed in N. B.

POPLAR (Populus)

BARK CANKER - Hypoxylon pruinatum (Klotzsch) Cke.

This disease was reported from four places in Saskatchewan on Populus tremuloides by R. C. Russell.

Poplar.

Kelliher - Disease was prevalent in several bluffs (groves) of trees in an old pasture. Infection ranged from 0.5 to 15 per cent. These trees were dead or dying.

A small percentage of the trees were dead or dying from bark canker at Naisberry, Poplar Beach, Waken and Hazel Dell. The fungus appears to be highly parasitic and to killtthe trees in their prime.

DIE BACK - Fusiclasium radiosum (Lib.) Lind.
About five inches of the tips of many young shoots on certain trees near Raymore, Sask., were killed. The affected tips were blackened and curled. Infected leaves were also collected at Manitoba Agricultural College, Winnipeg, Man.

LEAF SPOT - Septoria musiva Peck.
Collected at Beaver Creek, Sask., on P. balsamifera. The spots were small, brown and angular. Identified by Dr. Dearness.

POWDERY MILDEW - Uncinula Salicis (DC.) Wint.
Collected on P. balsamifera at Vonda, Sask. Mature perthecia present.

INK SPOT - Sclerotinia bifrons (Ell. & Ev.) Seaver.
(Sclerotium bifrons Ell. & Ev.)
Collected at Mossisburg, Ont.

LIMB GALLS - Cucurbitaria staphula Dearn.
This disease has been found on Populas balsamifera at Buchanan, Devils Lake, Naisbury and Beaver Creek, Sask., by R. C. Russell. He says: "The site of the original collection, which was made in 1924, was revisited. Many trees which were then infected are still living, except some badly infected branches. A similar disease on the bark of the trunks was also observed. At Beaver Creek a high percentage of the trees in one locality along a creek were more or less heavily infected. Most of the infected limbs were dead, some were dying and a few were still green". The percentage of infection was also high at Naisbury in a similar situation.

BLIGHT - Dothichyza populea Sacc. & H. Briard.
Several trees at the Experimental Station, Kentville, N. S. were almost entirely defoliated.

WOOD ROT - Fomes igniarius Fr.
This rot was very prevalent on native poplars in Queens county, P. E. I.

SPRUCE (Picea)

NEEDLE RUSTS -

The needle rusts of spruce were examined or reported as follows:-

Melampsoropsis ledicola (Peck.) Arth. on black spruce - Lawrence Station, near St. Stephen Highway, N. B. Also on white spruce, Riviere-du-Loup, Que. and on blue spruce (P. pungens) at Experimental Farm, Charlottetown, P.E.I.

Melampsoropsis abietina (Alb. & Schw.) Arth. - slightly prevalent on spruce in Victoria County, N. B. (D. J. MacLeod).

ENGLISH WALNUT (Juglans regia)

CROWN ROT - Cause unknown.

A few trees of Franquette variety were found affected with crown rot at Westbank, B. C.

WILLOW (Salix)

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

In Quebec the disease has been very destructive in Gaspé peninsula and Matapedia Valley and is now spreading to Rimouski and Temiscoutata counties. From 10 to 50 or 60 per cent of willows at several places in these latter counties are affected.

In New Brunswick the disease is serious on willows over the entire Province. It is also very destructive in Nova Scotia and Prince Edward Island. Most of the ornamental willows are succumbing to the disease.

RUST - Melampsora Bigelowii Thüm.

Light infection at Redberry Lake, Sask.

TAR SPOT - Rhytisma salicinum Fr.

Slight infections observed in N. B.

POWDERY MILDEW - Uncinula Salicis (DC.) Wint.

Mildew was common on willow in Alberta. Also a moderate infection of the swamp willows was reported from Prince Edward Island.

DISEASES OF ORNAMENTALS.

BEGONIA

LEAF SPOT - Cercospora sp.
Leaf spot was very severe at Experimental Station, Fredericton, N. B.

BARBERRY

RUST - Puccinia graminis Pers.
See under Stem Rust of Wheat.

BUCKTHORN

RUST - Puccinia coronata Corda.
See under Leaf Rust of Oats.

CARAGANA

LEAF SPOT - Septoria Caraganae (Jacz.) P. Henn.
A rather heavy infection of leaf spot occurred on the University campus, Saskatoon, Sask. Some bushes appeared to be more susceptible than others.

CARNATION (Dianthus Caryophyllus L.)

RUST - Uromyces Dianthi (Pers.) Niessl.
A small amount of rust was present in a greenhouse in New Brunswick in November. It was found in abundance in greenhouses at Charlottetown, P. E. I. in January.

LEAF SPOT - Alternaria Dianthi Stev. & Hall.
Reported from Iberville, Que.

CHINA ASTER

YELLOWS - Virus disease.

B. C. -
Yellows was present to a very slight extent in the Okanagan Valley.

Alta. -
Plants submitted for examination from Calgary were found to be affected with yellows. All the plants in a block of two thousand were reported to be infected with the disease.

Sask. -
Yellows affected most of the plants in the beds examined at the Experimental Station, Rosthern. The disease was also present at Saskatoon, where in several beds of asters 10 to 15 per cent of the plants were affected.

China asters.

N. B. -
Yellows was extremely severe on all varieties planted at the Experimental Station, Fredericton.

WILT - Fusarium conglutinans Woll. var. Callistephi Beach.

Sask. -
A small percentage of the plants in certain beds at Experimental Station, Rosthern, was affected with disease. It also destroyed several small beds of asters on the University campus, Saskatoon.

Ont. -
Diseased plants were sent for examination from Brockville and East Windsor.

Que. -
Wilt was very common in the Montreal district. It was also serious in other parts of the Province. Fifty per cent of the plants were killed by the disease in a small garden at Port Viau.

N. B. -
Wilt occurred only slightly this year. It was less severe than in previous seasons.

RUST - Coleosporium Solidaginis (Schw.) Thüm.
A slight but general infection developed late in the season at the Experimental Station, Fredericton, N. B.

CHRYSANTHEMUM

YELLOWS - Virus.
A slight amount of yellows occurred in the Experimental Station greenhouse, Fredericton, N. B.

DAHLIA

STEM AND ROOT ROT - Sclerotinia Sclerotiorum (Lib.) de Bary.
The disease caused some loss at Summerland, B. C. It was also reported from Toronto, Ont.

MOSAIC - Virus disease.
Mosaic was a very common disease on the most valuable dahlias at Charlottetown, P.E.I. Several varieties have been discarded on account of mosaic. It is also reported from the Experimental Station, Fredericton, N. B.

DUTCHMAN'S PIPE (Aristolochia Sipho L'Her).

STEM ROT - Sclerotinia Sclerotiorum (Lib.) de Bary.
Specimens from Lennoxville, Que. were found affected with stem rot.

GERANIUM (Pelargonium)

LEAF SPOT - Cercospora ?Brunkii Ell. & Gall.

A slight infection occurred in the Experimental Station greenhouse, Fredericton, N. B.

GLADIOLUS

BULB ROT - Fusarium sp.
A slight amount of rot occurred at Fredericton, N. B.

The following diseases were found in specimens submitted by correspondents.
Dry Rot-Sclerotium Gladioli Massey from London, Todmorden and Toronto.
Storage Decay - Penicillium Gladioli McCulloch & Thom. from Salmon Arm, B. C.
Scab - Bacterium marginatum McCulloch from Welland, Ont. and Salmon Arm, B. C.

GOLDEN GLOW (Rubeckia)

POWDERY MILDEW - Erysiphe Cichoracearum DC.
Several in gardens at Edmonton, Alta.

HOLLYHOCK

RUST - Puccinia Malvacearum Bert.

Ont. -
Diseased specimens were submitted from Douglas, Hampton and Picton.

Que. -
Rust was general in the Montreal district. It caused serious damage at Chateauguay Basin and on the Island of Montreal.

N. B. -
Rust was widely distributed and infection was severe.

N. S. -
The disease was reported from Kentville.

P. E. I. -
Rust has been responsible for the destruction of many of our best hollyhocks (R. R. Hurst).

LEAF SPOT - Ascochyta althaeina Sacc. & Bizz.

P. E. I. -
This leaf spot was reported as very common on many varieties.

IRIS

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

Ont. -
Diseased specimens were received from Newcastle.

N. B. -
Leaves were moderately infected late in the season, but it is of little economic importance.

P. E. I. -
Leaf spot was very common.

RHIZOME ROT - Bacillus carotovorus L. R. Jones.

Ont. -
Diseased specimens were submitted from Toronto.

N. B. -
One severe case of rhizome rot was observed in Fredericton.

BLIGHT - Botrytis sp.

A blight of Iris caused by a Botrytis was very common after rainy weather in Queens county, P. E. I.

LARKSPUR (Delphinium)

POWDERY MILDEW - Erysiphe Polygoni DC.
Infection was general, but no severe damage was done in New Brunswick. Diseased specimens were also submitted from Sharbot Lake, Ont.

Larkspur.

BACTERIAL BLIGHT - Bacterium Delphinii (E.F.Sm.) Bryan.
The disease was general but slight in York county, N. B. The organism should be referred to the genus Pseudomonas to be in accord with nomenclature here adopted.

LILAC

LEAF BLIGHT - Pseudomonas Syringae van Hall.
Diseased specimens were submitted from Vernon, Ont.

POWDERY MILDEW - Microsphaera Alni (Wallr.) Salm.
Powdery mildew was general but not serious in N. B.

Young shoots and leaves of lilacs were found attacked with Sclerotinia sp. at Ste. Anne de la Pocatière, Que. The shrubs were growing in a low, not unusually damp place. Sclerotia were present on the affected parts.

NARCISSUS

SMOULDER - Botrytis narcissicola Kleb.
Diseased specimens were submitted from New Westminster, B.C.

EEL WORM - Tylenchus dipsaci (Kühn) Bast.
Infected bulbs were sent from Burlington, Ont.

PEONY

BLIGHT - Botrytis Paeoniae Oud.
Diseased specimens were submitted from Meaford and Chesterville, Ont. and Acton Vale, Que.
Blight was present, but it was of no economic importance in N. B.
It was very severe on several varieties causing a wilting of the plants at Kentville, N. S.
Blight was common and destructive about Charlottetown, P.E.I.

LEAF SPOT - Septoria Paeoniae West. var. berolinensis Allesch.
Plants affected with the disease were received from Galt, Ont.

PHLOX

POWDERY MILDEW - Erysiphe Cichoracearum DC.
Diseased specimens were received from Newcastle, Ont.

LEAF SPOT - Septoria divaricata Ell. & Ev.
The disease occurred locally about Fredericton, N. B.

ROSE

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

Black Spot was found in abundance in connercial greenhouses, Niagara-on-the-Lake and East Windsor. The disease was reported on Frau Karl Druschki and Claudius Pernet at Ottawa, Ont.

Black spot was moderately severe at Experimental Station, Fredericton, N. B. It was reported as common on Frau Karl Druschki and Her Majesty at Charlottetown, P.E.I.

POWDERY MILDEW - Sphaerotheca pannosa (Wallr.) Lev.

Powdery mildew was more prevalent than in previous years in the Okanagan Valley, B. C.

Diseased specimens were received from Brockville, Whitby and Ottawa, Ont. It was fairly severe on rambler roses.

Rambler roses were the most seriously attacked in Nova Scotia. Mildew was seen or reported from many parts of the province.

RUST - Phragmidium spp.

Rust was observed on cultivated roses in Alberta. It was common on wild roses.

Rust occurred only slightly in New Brunswick.

Baron de Rothschild was heavily infected with rust causing some defoliation at Charlottetown, P.E.I. It was also common on many other varieties.

INFECTIOUS CHLOROSIS - Cause unknown.

Fifty per cent of the roses in one greenhouse in Ontario were affected with the disease. It was observed in stock from British Columbia only; the disease, however, was general in plants from that source.

A species of Sclerotinia was found attacking a few young rose plants at Neuville, Que.

SNAPDRAGON (Antirrhinum)

RUST - Puccinia Antirrhini Diet. & Holw.

Rusted specimens were received from Hopewell Cape and West St. John, N. B.

SWEET PEA

WILT - Fusarium Lathyri Taub.

Specimens affected with wilt were received from Huntington, Que, and Amherst, N. S. It was reported as destructive in a garden at Charlottetown, P.E.I.

Sweet Pea.

ROOT ROT - Thielavia basicola Zopf.
This fungus caused a severe root rot at Kentville, N. S. Specimens were also received from Weymouth, Wolfville and Amherst.

POWDERY MILDEW - Microsphaera diffusa Cke. & Peck.
It occurred only slightly in York county, N. B.

MOSAIC - Virus
Isolated cases of mosaic were observed in York county, N.B.

BUD ROOT - Non-parasitic.
Bud rot was quite prevalent in York county, N. B.

TULIP

BLIGHT - Botrytis Tulipae (Lib.) Lind.
One thousand bulbs each of Princess Elizabeth and Bartigon, which had been obtained from Holland, were all affected with blight when they were grown at Weston, Ont. Diseased specimens were also received from New Westminster, B. C.

ZINNIA

ROOT ROT - Fusarium sp.
Twenty-five per cent of the plants in a bed at Experimental Station, Summerland, B. C. were affected with a root rot caused by a species of Fusarium.

DISEASES ON MISCELLANEOUS PLANTS.

The parasitic fungi here reported are from records received from collaborators or from specimens collected and are now being added to the herbarium. Many of collections made in 1929 still remain to be indentified, but it is hoped that in time a complete record of each year's additions made be published here as far as the addition adds new information on the distribution or host range of the particular fungus. Fungi new to or rarely collected in Canada will be reported in every case. This list is arranged alphabetically by host.

Agrimonia gryposepala Wallr.
Pucciniastrum Agrimoniae (Schw.) Tranz. Murray Bay, Que.

Agropyron Griffithsii Scribn. & Smith.
Claviceps purpurea (Fr.) Tul. Glenwoodville, Alta.

Agropyron ?Smithii Rydb.
Calviceps purpurea (Fr.) Tul. Rainy River, Ont.

Agropyron repens (L.) Beauv.
Puccinia graminis Pers. South of Montreal, Que.; quite general. Widespread over Prince Edward Island. It develops earlier in season than stem rust of wheat and oats (Hurst).
Phyllachora graminis (Pers.) Fuck. Rougemont and Hemmingford, Que.

Agrostis spp.
Claviceps purpurea (Fr.) Tul.- Observed in Alberta.

Amaranthus retroflexus L.
Cystopus Bliti (Biv.) Lév. Fairly heavy infection. Oospores plentiful in the tissues of the leaves, some mature. Saskatoon, Sask. Sept. 9, 1929. Common on the Island of Montreal, Que.

Amarella strictiflora (Rydb.) Greene (=Gentiana Amarella L. var. acuta (Michx.) Herder).
Puccinia Gentianae (Strauss) Link II. Fairly common in a wooded draw, Dana, Sask.

Amelanchier alnifolia Nutt.
Apiosporina Collinsii (Schw.) v. Höhnel, Manitoba Agricultural College, Winnipeg, Man. and Redberry Lake, Sask.

Amelanchier sp.
Gymnosporanguim germinale Kern. O.I. Highbury, N. S.
Quite common in an old mountain pasture. Abundance of juniper in the neighborhood.

Arabis brachycarpa (T. & G.) Britton and A. retrofracta Greene
Puccinia monoica (Peck.) Arth. O.I. This systemic rust is common on Arabis at Saskatoon, Sask. The pycnial stage appears very early in the spring (May 5, 1929). Aecia collected May 27, 1929. (R. C. Russell).

Arctium Lappa L.
Puccinia Bardanae Corda. This rust was quite common on Oct. 5, 1929, at Kentville, N. S.

Artemisia gnaphalodes Nutt.
Puccinia Absinthii (Hedw.f.) DC. Lethbridge, Alta.
Puccinia universalis Arth. Duchess, Alta.

Artemisia sp.
Erysiphe Cichoracearum DC. St. Gregor, Sask. The fungus apparently stimulates the host to produce faciations.

Avena fatua L.
Puccinia graminis Pers. - P. E. I.
Puccinia coronata Cda. St. Agathe, Man., July 22, 1929. This was the first collection of crown rust in Manitoba for the year. Only one pustule found. Several fields of cultivated oats were examined, but no rust was found.

Avena Hookeri Scribn.
Claviceps purpurea (Fr.) Tul. - Rosetown, Sask. Light infection.

Aster ?Lindleyanus Torr. & Gray.
Puccinia Asterum (Schw.) Kern. Manitoba Agricultural College, Winnipeg, Man.
Puccinia Asteris Duby - Covey Hill, Que.

Bromus Pumpellianus Scribn.
Spikelet blight caused by mites. Found at Wolf Creek, Alta. and at several points between there and Edmonton. Affected spikelets much enlarged.
Claviceps purpurea (Fr.) Tul. Wolf Creek, Alta.

Capsella Bursa-pastoris (L.) Medic.
Cystopus candidus (Pers.) de Bary. Common in York Co. N.B.

Chenopodium capitatum (L.) Asch.
Septoria sp. Lake Waskesin, Sask. The leaves were well infected.

Cirsium arvense L.
Puccinia suaveolens (Pers.) Rostr. Generally distributed in New Brunswick.

Claytonia caroliniana Michx.
Puccinia claytoniata (Schw.) Arth. OI.- The rust was very general at Vaudreuil.

Comandra pallida DC.
Puccinia Andropogonis Schw. Stockton, Man.
Cronartium Comandrae Peck. St. Gregor, Sask. This rust is frequently found miles from the nearest pine trees.

Corylus rostrata Ait.
Gnomoniella Coryli (Batsch.) Sacc. Dana, Sask. Common.

Crataegus sp.
Gymnosporangium germinale (Schw.) Kern. Very common rust on once species of Crataegus. P.E.I.

Dactylis glomerata L.
Puccinia graminis Pers. P. E. I.

Distichlis sp.
Puccinia subnitens Diet. Vonda, Sask. Infection light.
Phyllachora graminis (Pers.) Fuck. Vonda, Sask. Infection heavy.

Dodecatheon pauciflorum (Durand) Greene.
Uromyces acuminatus Arth. OI. Humboldt, Sask. Rather rare.

Eleagnus commutata Bernh.
Puccinia Caracis-Shepherdiae Davis OI. Redberry Lake, Sask. Infection was quite severe. The more or less stellate arrangement of the pycnia was quite evident.

Erythronium ameridanum Ker.
Ustilago Heufleri Fuck. Vaudreuil, Que. Abundant in isolated patches of the host plants.

Galium boreale L.
Puccinia rubefaciens Johans. Souris, Man. Abundant.

Glycyrrhiza lepidota (Nutt.) Pursh.
Uromyces Glycyrrhizae (Rabh.) P. Magnus - Saskatoon, Sask. Infection was quite heavy.

Grindelia squarrosa (Pursh.) Dunal.
Puccinia Grindeliae Peck. Wakan, Sask. A patch by the roadside was quite heavily rusted. Not found very commonly.

Hedysarum boreale Nutt.
Uromyces Hedysaii-obscuri (DC.) Car. & Picc.
Foxwarren, Man. and Humboldt, Sask. Common.

Halerpestes Cymbalaria (Pursh.) Greene.
Puccinia Clematidis (DC.) Lagerh. OI. Redberry Lake, Sask. Common.

Helianthus sp.
Puccinia Helianthi Schw. III. Montfort, Que. Abundant on wild sunflowers growing in open places in the woods.

Hordeum jubatum L.
Puccinia glumarum (Schmidt) Erikss. & Henn. Alberta.
Ustilago Lorentziana Thüm. Payton and Rosetown, Sask.
Puccinia graminis Pers. Alberta and P. E. I.
Erysiphe graminis DC. Alberta.

Iva axillaris Pursh.
Puccinia intermixta Peck. I. Milestone, Sask.

Juniperus communis L. var. hibernica Gord.
Gymnosporangium germinale (Schw.) Kern.
" clavariaeforme (Jacq.) DC.
Telia stages of both these fungi were found on the same plant at the Experimental Station, Kentville, N. S.

Laciniaria punctata (Hook) Kuntze.
Puccinia Liatridis (Ell. & And.) Bethel. OI. Dana, Sask. Comparatively rare.

Lactuca pulchella (Pursh.) DC.
Puccinia hemisphaerica (Pk.) Ell. & Ev. OI. and II. West Emerson, Man.; OI, and II, III, Redberry Lake, Sask.
Puccinia patruelis Arth. OI. Redberry Lake, Sask.

Lathyrus ochroleucus Hook.
Uromyces Fabae (Pers.) de Bary III, Saskatoon, Sask. Rather heavy infection on plants growing in poplar grove.
Septoria Astragali Rob. & Desm. - leaf sport. St. Gregor, Sask.

Leontodon sp.
Puccinia Hieracii (Schum.) Mart. II. Zealandia, Sask. II. III. Melfort, Sask. Heavy infection.

Lygodesmia juncea (Pursh.) D. Don.
Puccinia patruelis Arth. I, Pike Lake, Sask. Medium infection on the majority of plants in one spot.

Maianthemum sp.
Puccinia sessilis Schneid. New Minas, N. S.

Malva rotundifolia L.
Puccina Malvacearum Bert. Kentville, N. S. Very common.

Malvastrum coccinium (Pursh.) Gray.
Puccinia Sherardiana Kørn. Blackie, Alta.

Monarda menthaefolia Benth.
Puccinia Menthae Pers. III & II. Dana, Sask.

Nabulus racemosa (Michx.) DC.
Puccinia orbicula Peck. & Clint. III - Cudworth, Sask.

Persicaria Persicaria (L) Small.
Septoria Polygonorum Desm. Island of Montreal, Que.

Petasites palmata (Ait.) Gray.
Puccinia conglomerata (Strauss) Schmidt. & Kunze. Redberry, Sask. Infection quite severe along edge of swamp.

Plantago major. L.
Erysiphe Cichoracearum DC. Common everywhere in Quebec.
Ramularia Plantaginis Ell. & Mart. Ronville Co., Quebec. General.

Polygonum aviculare L.
Uromyces Polygoni (Pers.) Duchess, Alta.; Morris, Man. and Henrysbury, Que.

Poa pratensis L.
Puccinia Poarum Niels. Duhamel, Alta.
Erysyphi graminis DC. Olds, Alta.

Portulaca oleracea L.
Cystopus Portulacae (DC.) Lev. Cambridge, N. S. Very common in local gardens.

Potentilla camporum Rydb. and Potentilla pulcherrima Lehm.
Phragmidium Ivesiae Syd. Beaverlodge, Alta. These two species of Potentilla were closely associated.

Potentilla monspeliensis L.
Ramularia arvensis Sacc. Hartney, Man.

Pyrola ?americana Sweet.
Melampsoropsis Pyrolae (DC.) Arth. M.A.C. Winnipeg, Man.

Raphanus Raphanistrum L.
Peronospora parasitica (Pers.) Fr. Kentville, N. S. Very prevalent at this time.

Ribes nigra.
Puccinia Pringsheimiana. Kleb. M.A.C. Winnipeg, Man.

Rosa Sp.
Phragmidium speciosium (Fr.) Cooke. Moden, Man.

Rubus spp.
Gymnoconia interstialis (Schlect.) Lagerh. Gananoque, Ont. Very abundant in a woods.

Rudbeckia laciniata L.
Ramularia Rudbeckiae Pk. - Neepawa, Man.

Shepherdia canadensis (L.) Nutt.
Puccinia coronata Cda. OI. Saskatoon, Sask. Quite common.

Solidago conadensis L.
Phylachora Solidaginum Sacc. Macdonald College, Que. Very abundant.
Solidago sp.
Puccinia extensicola Plowr. I. Redberry Lake, Sask. Heavy infection.

Stieronema ciliatum (L.) Raf.
Puccinia Distichlidis Ell. & Ev. M.A.C. Winnipeg, Man.

Stipa viridula Trin.
Ustilago hypodytes (Schl.) Fr. Neepawa, Man.
Puccinia substerilis Ell. & Ev. X. Raymore, Sask.
As is usual the collection shows emphispores almost to the exclusion of urediniospores or teliospores.

Symphoricarpos sp.
Septoria Symphoricarpi Ell. & Ev. St. Gregor, Sask. Fairly common.

Taraxacum officinale Weber.
Puccinia Hieracii (Schum.) Mart.- About Montreal, Que. and York Co., N. B. Infection heavy.

Ramularia Taraxaci Karst. General around Montreal, Que.

Thalictrum dasycarpum Fisch, Mey. & Ave.-Lall.
Puccinia clematidis (DC.) Lagerh. Edmonton, Alta.

Thalictrum sp.
Puccinia clematidis (DC.) Lagerh. Redberry Lake, Sask. Moderate infection.

Trifolium hybridum L,
Cereospora zebrina Pass. Dauphin, Man.

Vicia sparsifolia Nutt.
Uromyces albus Diet. & Holw. O. & I. Saskatoon, Sask.
Heavy systematic infection in certain patches. The rust appears to prevent the host from flowering.

Viola pedatifida G. Don.
Puccinia Violae (Schum.) DC. O.& I. Sutherland, Sask.
The host is quite rare.

INDEX OF HOSTS

As all the diseases occurring on a given host occupy relatively few pages under the name of the hosts, it was thought unnecessary to prepare more than a host index. For diseases on miscellaneous (non-economic) plants that section should be consulted directly. The hosts are arranged alphabetically under the scientific name of the plant.