II. DISEASES OF FORAGE AND FIBRE CROPS

ALFALFA

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

B.C.- All 7 varieties of alfalfa grown at the Agassiz Experimental Farm were equally susceptible to common leaf spot. The disease caused slight damage in the Fraser valley and on Vancouver island. A slight infection of this leaf spot was reported from McGillivray's Flats and Summerland.

Sask.- A trace of common leaf spot was found in one field in zone 9.

Man.- A slight infection was present on the lower leaves at Gimli; the variety Lytton was severely infected at the Experimental Station, Morden.

Ont.- The lower leaves were affected by common leaf spot in the Forage Crop plots, Ottawa. (3699)

Que.- The disease infected all the Alfalfa fields examined in eastern Quebec, but the damage was slight, although in one field at Cap Rouge it caused some defoliation.

N.B.- Common leaf spot was general in York and Sunbury counties.

P.E.I.- A trace to heavy infections of this leaf spot were observed in all 3 counties.

DOWNY MILDEW - Peronospora trivialis Sydow
(P. Trifoliorum de Bary p.p.)

B.C.- On July 16, Mr. J.W. Eastham made a special survey of alfalfa in the Lytton district, where he inspected the fields of the Indian School at Lytton and those of McGillivray's Ranch, McGillivray's Flats, about 22 miles north of Lytton. The fields at the school were singularly free of disease. However, he noticed that along the irrigation ditches and in spots where there was excess moisture, due to seepage, downy mildew was quite severe. (3657). At Mr. McGillivray's no downy mildew was present. Other diseases were noted at these places, but they will be reported under their respective headings.

Alta.- Downy mildew was moderate to severe in 3 fields out of 19 examined.

CROWN ROT - Sclerotinia sp.

B.C.- Crown rot apparently does not occur at the Indian School, Lytton.

Alta.- A trace of crown rot was reported from a field in zone 3.

Sask.- Six plots of alfalfa were entirely killed by crown rot at the Experimental Station, Scott.

Ont.- A trace of crown rot was found on May 5 at Ottawa (3699).

YELLOW LEAF BLOTCH - Pseudopeziza Jonesii Nannf.
(=Pyrenopeziza Medicaginis Fuck.)

B.C.- Yellow leaf blotch caused from 1 to 5% damage in patches and was more or less present in a 30-acre field at McGillivray's Flats. (3659)

Sask.- The disease caused slight injury to alfalfa at the Experimental Farm, Indian Head, and a trace was found in one field in zone 1.

WITCHES' BROOM - Cause undetermined.

B.C.- At Lytton and McGillivray's Flats there were certain patches in the fields, which contained several plants affected with witches' broom. It is characterized by a large number of thin, wiry, branched stems with very small foliage. The disease was also noticed in other fields in Cariboo county and a single diseased plant was recorded from Summerland. It is found mostly in fields which are surface irrigated, particularly in those which have been laid down for a number of years.

MOSAIC - Virus

Alta.- Mosaic caused light damage in 3 fields out of 19 examined.

CHLOROSIS - Cause undetermined.

P.E.I.- Alfalfa suffered slightly from chlorosis in one field in Queens county. The cause was not determined.

CROWN ROT - Cause undetermined.

N.S.- A crown rot, the cause of which was not determined, was found causing moderate damage to alfalfa by Mr. F. Kinsman. The plants were noticeably stunted.

DROUGHT INJURY

Alta.- Alfalfa was moderately damaged by drought injury in 2 fields.

WATER INJURY

Alta.- One field of alfalfa suffered moderate injury from excessive water.

COMMON CLOVER

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

P.E.I.- Common leaf spot was moderately destructive to clover.

POWDERY MILDEW - Erysiphe Polygoni DC.

B.C.- Powdery mildew was fairly general and caused slight

damage in the Fraser valley and on Vancouver island. It also caused severe damage to red clover at Summerland.

Ont.- Powdery mildew was recorded on volunteer plants of red clover at Kenora.

Que.- The disease was general along the lower St. Lawrence from Cap Rouge to Rimouski, but it caused slight damage.

N.B.- Powdery mildew was general and severe in York, Carleton, Sunbury, Charlotte, Victoria, Kings and Westmoreland counties.

P.E.I.- This disease caused slight to severe demage to red clover in all 3 counties.

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

B.C.- Rust was general in the Fraser valley on red and alsike clover, especially the former; the damage was slight. A trace of rust only was found on white clover at Agassiz.

Sask.- Clover was moderately infected with rust along a roadside at Watson.

Man.- Volunteer plants of alsike clover were moderately rusted at Winnipeg and Lac du Bonnet, as were also those of white clover at Winnipeg.

Que.- Rust was common on clover in pastures, but it apparently caused little damage in western Quebec. It was not present in every field in eastern Quebec, but where it did occur, the plants in certain patches were covered with rust and the leaf surface was badly dried up.

P.E.I.- Rust heavily infected red clover in Queens county.

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

Sask.- Sooty blotch was found on a few plants of alsike clover by the roadside at Watson.

Que.- Sooty blotch was fairly common on clover at Ste. Anne de la Pocatière and caused some drying-up of the foliage.

P.E.I.- Sooty blotch caused slight damage to red clover in Queens county.

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

Alta.- A light infection of anthracnose was found on red clover in the University plots.

STAGONOSPORA LEAF SPOT - Stagonospora Meliloti (Lasch) Petr.

Alta.- Leaf spot caused moderate damage in one field in zone 10.

MOSAIC - Virus

B.C.- Mosaic was seen only occasionally on red clover, while it is quite general on white clover in the Salmon Arm district.

Ont.- Mosaic affected 47% of the plants in the breeding block of red clover at the Experimental Farm, Ottawa (2069). Many of these plants were severely stunted, while others were a goodly size, but showed more or less well-marked symptoms of mosaic. The high percentage of plants affected is remarkable as all plants that did not appear healthy for any reason had been rogued out late in the season the previous year. Mosaic was quite prevalent in other plots of clover, where the plants were not individually spaced, but the diseased plants were not as noticeable as they were more or less supressed by the more vigorous healthy plants. (I.L. Conners & M. Timonin)

CERCOSPORA LEAF SPOT - Cercospora zebrina Pass.

Man.- Volunteer plants of alsike clover were moderately infected with this leaf spot at Lac du Bonnet.

DOWNY MILDEW - Peronospora Trifoliorum de Bary

P.E.I.- Clover was moderately infected with downy mildew in Queens county.

SWEET CLOVER

MOSAIC - Virus

B.C.- Mosaic affected about 0.5% of the sweet clover in the Salmon Arm district.

CROWN ROT - Sclerotinia sp.

Alta.- Crown rot caused a trace and 10% damage respectively in 2 fields out of 6 examined.

Sask.- Crown rot destroyed 10 plots at the Experimental Station, Scott.

Man.-Volunteer plants were slightly affected by crown rot at Brunkild.

LEAF SPOT - Pseudopeziza Medicaginis (Lib.) Sacc.

Man.- Leaf spot was abundant on volunteer plants along the river bank at Winnipeg (J.E. Machacek).

Examination of the material showed clearly that the leaves are affected by a Pseudopeziza in good condition. The only previous record of the occurrence of P. Medicaginis on sweet clover that I was able to locate was one by Tracy and Earle (Miss. Agr. Exp. Sta. Bull. 34:106. 1895), when they report its occurrence not only on Medicago sativa but also on Melitotus alba and Vicia villosa. However, F.R. Jones (U.S. Dept. Agr. Bull. 759:21. 1919) was unable to infect Melilotus alba with the Pseudopeziza from Medicago sativa and similarly Horsfall (Cornell Univ. Agr. Exp. Sta. Memoir 130. 1930) failed to infect the same host with P.

Trifolii. Further studies on the morphology and host specialization in these species are necessary (cfr. Nannfeldt, Nova Acta Reg. Soc. Sci. Upsaliensis ser. 4,8:179. 1932, and Jones, l.c.) (I.L. Conners)

STEM CANKER - Stagonospora Meliloti (Lasch) Petr.
Man.- A trace of stem canker was present throughout the province.

CORN

BACTERIAL STALK ROT - Bacterium dissolvens Rosen
Sask.- A trace of bacterial stalk rot was found at Indian Head.

SMUT - Ustilago Zeae Unger
Man.- Corn was moderately infected with smut at the Experimental Station, Morden. At least a trace of corn smut occurs generally throughout the province.
Que.- Corn smut was found in 3 fields in Kamouraska county. Diseased specimens were received from Rivière du Loup, St. Sylvère, and Danville. Damage was a trace.
N.B.- A trace of smut was found on Twitchells Pride at the Experimental Station, Fredericton.

RUST - Puccinia Sorghi Schw.
Que.- A trace of rust was present in one field at Ste. Anne de la Pocatière.

FLAX

RUST - Melampsora Lini (Ehrenb.) Desm.
Sask.- A trace of rust was found in one field out of 3 examined.
Man.- A trace of rust was present at Roblin, Sanford and Brunkild. Three other fields were free.

WILT - Fusarium Lini Bolley
Man.- A trace of wilt was recorded at Brandon and Wawanesa.
Ont.- Some strains of flax showed up to 60% wilt in a progeny test on wilt-sick soil at Ottawa.

BROWNING - Polyspora Lini Laff.
Alta.- Sixty per cent of the seeds in a sample from Provost were infected with Polyspora Lini.

HEAT CANKER
Sask.- Heat canker caused about 5% damage to a plot at the University, Saskatoon, on July 20, following several hot days.

Heat and drought also caused premature dying of the stem tips in August at the University. It was rather conspicuous in small areas in several widely scattered plots.

MANGEL

BLACK LEG - Phoma Betae (Oud.) Frank

B.C. Black leg caused a loss of 2% in a field of seed plants on Vancouver island.

MOSAIC - Virus

B.C.- Mosaic affected about 5% of the plants being grown for seed in one field on Lulu Island, near Vancouver. The grower was advised to rogue out the diseased plants. (J.W. Eastham)

The above is the first report of this disease in Canada. It occurs on beet, sugar beet and mangel in Europe (Kohler, E., Viruskrankheiten. In Sorauer Handb. d. Pflanzenkr. Band 1, Teil 2, 6te Aufl. pp. 479-482, 1934). It was first found in the United States in 1915 on sugar beet and it has become of considerable importance in Washington, where garden beets are grown for seed, since its appearance in 1929. (Jones, L.K., The mosaic disease of beets. Wash. Agr. Exp. Sta. Bull. 250. 1931)

SOYBEAN

MOSAIC - Virus

B.C.- About 30% of soybeans were affected with mosaic in the selection blocks at the Experimental Station, Summerland.

Ont.- A percentage of the plants at the Experimental Station, Harrow, showed mottling, typical of mosaic.

BACTERIAL BLIGHT - Pseudomonas glycinea Coerp.

Sask.- Bacterial blight was collected at Scott on August 15 (2058).

Ont.- About 0.5% of the plants were affected with bacterial blight in the seedling stage in the Forage Crop plots, Ottawa, on June 15. On some plants chocolate brown lesions were present on the stem at the ground line or on the cotyledons. On others the stem was only green and watery. A characteristic bacterium was isolated from the lesions. Plants attacked in the seedlings stage nearly all succumbed, but as these were well scattered in the rows the damage was slight. A slight amount of blight was present on the fully grown plants, but the different varieties were not all equally diseased.

Que.- All plants were slightly infected by bacterial blight at the Experimental Station, L'Assomption.

SUNDAN GRASS

BACTERIAL BLIGHT - Bacillus Sorghi Burrill

Man.- A trace of bacterial blight occurred at Morden.

SUNFLOWER

WILT - Sclerotinia Sclerotiorum (Lib.) deBary

Sask.- This disease caused slight damage at Spy Hill.

Man.- Damage caused by wilt was reported as follows: Oakville, 10% of the plants killed; Niverville, 2%; Morden, trace.

Que.- A trace to 10% of the plants were affected by wilt in 5 fields examined in Kamouraska county.

DOWNY MILDEW - Plasmopora Halstedii (Farl.) Berl. & deToni

Que.- Downy mildew was first observed at Ste. Anne de la Pocatière in June, when the plants were about 6 to 12 inches high. The affected plants remained stunted and did not grow higher than 15 inches except an odd plant. In August, as the result of secondary infection, downy mildew has spread until very few of the remaining plants were free of the disease; large discoloured areas were formed on the leaves, but the plants were otherwise normal. In the 3 fields on the Experimental Station, 61% of the plants remained stunted and were a total loss. Nevertheless, the yield of this year's crop was only slightly less than that of last. In 2 other fields at Ste. Anne, 6% of the plants remained stunted. (C. Perrault)

RUST - Puccinia Helianthi Schw.

Sask.- Traces of the aecial stage were present on July 17, at the Experimental Farm plots, Indian Head, and a slight infection showing uredinia and telia was found on August 16 on all the lower leaves.

Ont.- Rust in the telial stage heavily infected the leaves and to a lesser extent the stems at the Experimental Farm, Ottawa, in September. Many of the leaves were dead from rust.

Que.- Rust was general wherever sunflowers were grown in eastern Quebec. At Cap Rouge, where the disease was more prevalent, it caused yellowing of the affected leaves. A slight infection was reported from Abbotsford.

POWDERY MILDEW - Erysiphe Cichoracearum DC.

Man.- A heavy infection of powdery mildew was reported from Winnipeg.

VETCH

STEM CANKER - Ascochyta sp.

Que.- Stem canker infected 50% of the cultivated vetch plants in a field in Kamouraska county. The stems, leaves and pods were

infected. Diseased plants remained small and dried up early. (C. Perrault)

BROOM MILLET

SMUT - Sorosporium Panici-milacei (McAlp.) Takah.

Sask.- A correspondent from Alameda reported smut in his hog millet for the previous three years.

N.B.- Smut was found in one plot at the Experimental Station, Fredericton.

CULTIVATED GRASSES

AWNLESS BROME GRASS (Bromus inermis)

Ergot (Claviceps purpurea (Fr.) Tul.) heavily infected volunteer brome grass at Winnipeg and Durban, Man., 75-90% and 100% of the plants respectively, being affected. Infection is general in the province.

A single infected plant was found at Fredericton, N.B.

Leaf blotch (Helminthosporium Bromi (Died.) Drechsl.) was very abundant throughout Manitoba in 1934 on volunteer plants. A trace was present in the experimental plots at Morden, Man.

Leaf spot caused by Septoria bromigena Sacc. and to a lesser extent by S. Bromi Sacc. was general throughout Manitoba on volunteer brome grass along roadsides. A trace of S. bromigena occurred in the plots at Morden, Man.

Scald (Rhynchosporium Secalis (Oud.) Davis) was common in Alberta. It heavily infected one field at Edmonton.

CRESTED WHEAT GRASS (Agropyron cristatum)

Ergot (Claviceps purpurea (Fr.) Tul.) was found in a few fields in the Fraser valley, B.C.

A slight infection was recorded at Winnipeg, Man.

Foot rot nearly destroyed a plot of crested wheat grass in the Forage Crop plots, Ottawa. Isolations from the diseased plants yielded almost entirely Helminthosporium sativum P.K. & B. (M. Timonin)

ITALIAN RYE GRASS (Lolium italicum)

Leaf spot (Ovularia sp.) was fairly well distributed on Vancouver island and in the Fraser valley, B.C. Infection ranged from 10 to 80% of the leaf surface; the loss was slight.

KENTUCKY BLUE GRASS (Poa pratensis)

Arthur (Man. Rusts U.S. and Canada p. 150. 1934) has shown that the rust commonly occurring on this grass should be referred to Puccinia Poae-sudeticae (West.) Jørst. It is not improbable that Puccinia Poarum Niels. may be found in Canada as the aecia

have been collected by Fraser on Tussilago Farfara in Nova Scotia. A slight infection of rust on this grass was reported from Queens county, P.E.I.

Leaf blotch (Helminthosporium vagans Drechsl.) was prevalent in lawns at Edmonton, Alta.

Smut (Ustilago striaeformis (West.) Niessl) was collected on volunteer plants, Ottawa, Ont. (3545)

ORCHARD GRASS (Dactylis glomerata)

Powdery mildew (Erysiphe graminis DC.) caused a trace of damage to orchard grass at Saanichton, B.C.

PERENNIAL RYE GRASS (Lolium perenne)

Leaf spot (Ovularia sp.) was rather heavy and fairly general in the Fraser valley. The lower leaves are mostly affected and wither from the attack.

A trace of ergot (Claviceps purpurea (Fr.) Tul.) was found in a few fields in the Fraser valley, B.C.

TALL OAT GRASS (Arrhenatherum elatius)

A few pustules of stem rust (Puccinia graminis Pers.) was found on tall oat grass in a plot at Charlottetown, P.E.I. (2292)

Leaf spot (Scolecotrichum graminis Fckl.) heavily infected this grass at Agassiz, B.C.

Smut (Ustilago perennans Rostr.) affected 2% of the heads at Agassiz, B.C.

TIMOTHY (Phleum pratense)

Stem rust (Puccinia graminis Pers. var. Phlei-pratensis (Erikss. & Henn.) Stakm. & Piem.) caused heavy damage in all 3 fields examined in Alberta.

Stem rust severely infected volunteer plants at Elm Creek, Lac du Bonnet, and Roblin, Man.

Stem rust was first observed in the Forage Crop plots, Ottawa on June 29. It became prevalent and destructive; some strains were heavily infected, while others were apparently free from rust.

Stem rust was general in timothy fields, but infection was light and caused no apparent damage in eastern Quebec. Timothy was heavily rusted in a field in Laval county.

Stem rust caused light to severe damage to timothy, both cultivated and wild, in Queens county, P.E.I.

Heterosporium leaf spot (H. Phlei Gregory) was abundant on patches of volunteer plants at Carman, Man.

Last year's leaves of timothy were abundantly spotted when the Forage Crop plots, Ottawa, Ont., were examined on May 2. When these leaves were placed in a moist chamber the conidiophores and conidia of the fungus were formed in abundance. A similar production of conidia took place in the field during a rainy period about May 22. (3594) However, the new growth developed more quickly than the disease spread. It appeared to do little damage.

Scolecotrichum leaf spot (S. graminis Fuck.) moderately infected one patch of volunteer plants along the roadside at Oakville, Man.

Traces of ergot (Claviceps purpurea (Fr.) Tul.) were found on wild plants in Queens county, P.E.I.

Smut (Ustilago striaeformis (West.) Niessl) was collected on volunteer plants at Ottawa, Ont. (3587)

WESTERN RYE GRASS (Agropyron tenerum)

Smut (Ustilago bromivora (Tul.) Fisch. v. Wald.) was common in Alberta. In one 10-acre field in zone 10, 45% of the plants by count were infected.

Plants, which were growing along the roadside, were heavily infected at Winnipeg, Man.

Ergot (Claviceps purpurea (Fr.) Tul.) slightly infected wild plants at Winnipeg, Man.

A trace of leaf spot (Scolecotrichum graminis Fuck.) was found in a field at Lacombe, Alta.

LAWNS

Snow mould (cause ?) was common and caused 30-35% damage in two lawns in zone 10, Alberta.

Brown patch (Rhizoctonia Solani Kühn) caused the death of the grass in several areas in a lawn of about 800 sq. ft. at Niagara Falls, Ont., in August.

Slime mould (Physarum cinereum (Batsch) Pers.) covered about one quarter of a small lawn in St. Catharines, Ont., on July 30, (3679). It also spread over the leaves of clover, gaillardia, portulaca, pink, dandelion and chickweed in an adjacent garden.