## II. DISEASES OF FORAGE AND FIBRE CROPS

### ALFALFA

COMMON LEAF SPOT (Pseudopeziza Medicaginis) was general but caused slight damage on Vancouver island and at Agassiz, B.C. It was also quite general in all the alfalfa fields at the Summerland Station, particularly on the lower leaves. It slightly to moderately infected 4 out of 12 fields examined in Alta. A slight infection occurred on Grimm, Lodak and Medicago falcata at Morden, Man. This leaf spot caused quite a severe dropping of the lower leaves at Macdonald College and Senneville, Que. It was general but injury was slight at Cap Rouge and Ste. Anne de la Pocatiere. Infection was heavy near Newcastle and Bathurst, N.B. and moderate at the Fredericton Station. It was very common this season in P.E.I.

YELLOW LEAF BLOTCH (Pseudopeziza Jonesii) was severe in a 4-acre field at Hatzic, B.C. It was observed at Saskatoon, Sask.

DOWNY MILDEW (Peronospora aestivalis) caused moderate damage to Lytton and slight on Ontario Variegated and Lodak at Agassiz, B.C. (W. Jones). It was general, but damage was slight at Saanichton. It was rather heavy, stunting the tips of the shoots and preventing flowering at Senneville, Que. The loss was serious as the crop was being grown for seed.

STAGONOSPORA LEAF SPOT (Leptosphaeria pratensis Sacc. & Briard (Stagonospora Meliloti (Lasch) Petrak). F.R. Jones and J.L. Weimer (Jour. Agr. Res. 57:791-812. 1938) have shown recently that Stagonospora Meliloti is the cause of an important root rot of alfalfa and of a leaf spot and stem blight of sweet clover. It causes a seemingly unimportant leaf spot on several species of Medicago, Melilotus, and Trifolium. The leaf spot symptoms are similar on all the hosts and is described in detail on alfalfa. The root rot on alfalfa and the stem blight of sweet clover are also fully reported. Stem blight has been induced in alfalfa, but it has not been observed in the field.

Since this article appeared, Dr. Jones has kindly examined the specimens of fungi in our Herbarium on Medicago, Melilotus, and Trifolium, which might belong in this complex. The results of his examination will be reported under the respective hosts and fungi found. Stagonospora Meliloti was not found on any Medicago material. (I.L. Conners)

BLACK STEM (Ascochyta imperfecta Peck). According to Dr. A.W. Henry, black stem of alfalfa has been common at Edmonton, Alta. for several years. He isolated a fungus which fitted the description of Phoma Medicaginis Malbr. & Roum. (cfr. E.M. Johnson and W.D. Valleau, Ky. Agr. Exp. Sta. Bull. 339. 1933) fairly well. However, spetate spores were sometimes observed. Dr. M.W. Cormack reports that a slight to moderate infection was observed in 6 fields out of 12 examined in Alta. in 1938. He states this is the most common type of Ascochyta stem injury on alfalfa in Alta. The stems are blackened and bear few pycnidia. F.W. Toovey, J.M. Waterston and F.T. Brooks, who have studied the disease in Great Britain (Ann. Appl. Biol. 23:705-716. 1936) have concluded that Phoma Medicaginis is synonymous with Ascochyta imperfecta. They studied an isolation from alfalfa from Kelowna, B.C., identified by Sprague as A. imperfecta. Specimens on alfalfa in our Herbarium from Kentville, N.S., and Indian Head, Sask., were identified as A. imperfecta by Dr. F.R. Jones. These widely scattered collections indicate that the disease is probably more common than realized in Canada. (I.L. Conners)

ROOT ROT (Fusarium avenaceum, Plenodomus Meliloti, etc.) caused a trace to slight damage in 4 fields, moderate damage in 12, severe damage in 7 out of 30 examined in Alta. In the severely injured 20-25% of the plants were killed. This year Fusarium avenaceum and Plenodomus Meliloti were most frequently associated with early spring injury of alfalfa and sweet clover, but Cylindrocarpon Ehrenbergi and Sclerotinia sp. were also isolated from diseased roots. (M.W. Cormack)

YELLOWS (boron deficiency) was quite general at the Summerland Station, B.C., in areas where an application of boric acid has not been made to the soil. (G.E. Woolliams)

WITCHES' BROOM (cause undetermined) affected a few plants of the Lodak variety at the Agassiz Station, B.C. It is widely distributed in the interior of the province, principally in irrigated areas. (W. Jones)

## COMMON CLOVER

COMMON LEAF SPOT (Pseudopeziza Trifolii) was general and severe on the lower leaves where clover was heavy at the Ste. Anne de la Pocatiere Station, Que. It was also reported as slight to severe on red clover in P.E.I.

POWDERY MILDEW (Erysiphe Polygoni) was recorded as follows: on an occasional red clover plant in the Summerland district,B.C.; trace to slight infection on red clover at Brooks and Olds, Alta.; slight infection at Macdonald College, Iberville, Ste. Anne de la Pocatiere and Cap Rouge, Que.; moderately heavy in York county, N.B. and at Charlottetown, P.E.I.

STAGONOSPORA LEAF SPOT (Leptosphaeria pratensis Sacc. & Briard (Stagonospora Meliloti (Lasch) Petrak) was found on Trifolium hybridum at Shirley Bay, Ont. in 1930. The identification was confirmed by Dr. F.R. Jones. (I.L. Conners)

Stagonospora leaf spot on red clover, Trifolium pratense, is due to a closely related species, Stagonospora recedens (C. Massal.) Jones & Weimer (syn. Gloeosporium Trifolii Peck) (Jour. Agr. Res. 57:791-812. 1938). It is represented in the herbarium by a specimen collected at London, Ont., by Dearness. (I.L. Conners)

GLOEOSPORIUM LEAF SPOT (Gloeosporium spadiceum Dearn. & Bisby) was described on T. pratense from material collected at Birds Hill, Man. A collection from the type locality is in the Herbarium. (I.L. Conners)

RUST (Uromyces Trifolii) was general on red clover, Saanichton, B.C.; infection was slight at Macdonald College, Que. and a trace at Cap Rouge and Ste. Anne de la Pocatiere; it was fairly heavy at the Fredericton Station, N.B. and slight to severe in all 3 counties of P.E.I.

WILT (Sclerotinia sclerotiorum) was severe in a half-acre field on Thetis Island, Chemainus, B.C. The sclerotia were cultured by Dr. Groves and the fungus was identified as S. sclerotiorum. According to the grower the field on which tomatoes were raised for several years, was plowed and sown to Mammoth Red clover with oats as a cover crop in 1937. A heavy crop of oats was cut green for hay and after the fall rains an excellent stand of clover developed. Then in December it began to fall out in spots, which enlarged until more than half of the tops had rotted away. However, a plant dug up about Feb. 1, possessed a sound root. New leaves began to appear on Mar. 14, and on May 4, the clover plants seemed to be coming up very well, but the old tops were still dying off. (I.L. Conners)

ROOT ROT (Sclerotinia Trifoliorum) appeared to be the most destructive disease affecting red clover at Macdonald College and Senneville, Que. From 3-5% of the plants were affected, practically all of which were killed. (I.H. Crowell)

SCOTY BLOTCH (Cymadothea Trifolii) was severe in York county, N.B. wherever the growth was heavy and aeration poor (S.F. Clarkson). Infection varied from a trace to heavy in P.E.I.

ANTHRACNOSE (Kabatiella caulivora). A few plants of Siberian Red clover were severely infected in the plots at Olds, Alta.

STEMPHYLIUM LEAF SPOT (Stemphylium sarcinaeforme (Cav.) Wiltsh.; syn. Macrosporium sarcinaeforme Cav.) was observed on red clover at Macdonald College. It is not a common disease in the fields and it apparently causes little damage, although individual leaves are killed (W.E. Sackston and I.H. Crowell). The disease has not been previously reported in Canada although a search has been made for it on several occasions by the writer. S.P. Wiltshire (Trans. Brit. Myc. Soc. 21: 211-239. 1938) has shown that this and other species of Macrosporium are more correctly referred to the genus Stemphylium. (I.L. Conners)

MOSAIC (virus). Clover mosaic was severe on about 3% of the red clover plants at Macdonald College, Que. Another unidentified virus disease of clovers distinct from the above was perhaps even more destructive. (I.H. Crowell)

## SWEET CLOVER

STAGONOSPORA LEAF SPOT and STEM BLIGHT (Leptosphaeria pratensis Sacc. & Briard (Stagonospora Meliloti (Lasch) Petrak). The leaf spot has been noticed frequently on sweet clover, and specimens are in the Herbarium from B.C., Alta., Sask., Man., and Ont. These determinations appeared correct to Dr. Jones. The pathogen has not been observed causing stem blight (I.L. Conners).

A slight to moderate infection of the leaf spot was observed in 6 fields out of 8 examined in Alta. in 1938 (M.W. Cormack).

STEM CANKER (Ascochyta caulicola Laub.) F.R. Jones (Phytopath. 28:661-662. 1938) reports the finding of two species of Ascochyta on sweet cover. One species has for its perfect stage, Mycosphaerella lethalis Stone, and causes stem blackening. Its presence in Canada has not been established. The other is Ascochyta caulicola Laub. It has been observed in Alberta for many years by Dr. Henry and it was seen by Dr. Bisby and me in Manitoba. At present it is unrepresented in our Herbarium. (I.L. Conners)

ROOT ROT (Fusarium avenaceum, Plenodomus Meliloti, etc.). Several varieties were moderately to severely infected in the plots at Edmonton and Lethbridge, Alta.

DOWNY MILDEW (Peronospora Meliloti) was general in a plot at the Saanichton Station, B.C., but the damage was slight (W. Jones). It was reported in 1935 in Alta. (P.D.S. 15:17.)

## LENTIL

LEAF SPOT (Septoria sp.). A trace of infection was found on a few plants at Morden, Man.; more material is required before the species can be determined.

## YELLOW TREFOIL

MOSAIC (virus). A few affected plants were observed in a small plot at the Summerland Station, B.C.

## BROOM-CORN MILLET

SMUT (Sorosporium Panici-miliacei). Several affected heads were found in the plots at Lethbridge, Alta. and a single smutted plant at Charlottetown, P.E.I.

## BUCKWHEAT

YELLOWS (virus). In 18 varieties, representing 7 rough and 11 smooth sorts, yellows averaged 3.3% for the rough sorts and 0.6% for the smooth, in the plots at Fredericton, N.B. The average yield of the smooth sorts was about double that of the rough varieties. The disease appears to be common throughout the province. (J.L. Howatt & John McKenzie)

## CORN

SMUT (Ustilago Zeae) affected 8% of the plants in a field at Medicine Hat, Alta. A trace was also present in Blue Snow pop corn at Brooks. Smut affected 2.5% of the plants in 4 fields out of 12 inspected in southern Sask.

Smut was general but not severe, in most fields visited in Western Ontario. In 2 fields near Ailsa Craig and two near Chatham, infection was heavy (G.A. Scott). Traces of smut occurred in one field in P.E.I. and in one field in Cumberland county, N.S.

RUST (Puccinia Sorghi) was common in the south and east of Sask.; damage was slight. A trace was recorded at Cap Rouge, Que., and a slight infection in Queens county, P.E.I.

## FLAX

RUST (Melampsora Lini) slightly infected flax at Duchess, Sask., and a 4 points in Man. It was moderate at Poplar Point. At Morden it was severe on N.D.R. 114, but slight on Siberian.

WILT (Fusarium Lini). A trace to slight infection was found in two fields in southern Alta. Only a trace of wilt occurred at Saskatoon, Sask.; in fact flax was freer from diseases than usual. (T.C. Vanterpool)

WILT and ROOT ROT (Rhizoctonia Solani). Fusarium wilt-resistant and other varieties wilted in June at Brandon, Man. Isolations from the basal parts of the young plants showed them to be heavily infested by Rhizoctonia Solani almost exclusively. A few isolations only of Fusarium Scirpi var. acuminatum were obtained. The material was sent in by Mr. W.H. Johnston. (W.L. Gordon)

BROWNING (Polyspora Lini). Several plots in the Fibre Division, Central Experimental Farm, Ottawa, Ont., suffered browning injury in the cotyledon and early seedling stages. The organism was isolated from diseased material of the variety Stormont Cirrus and from the same seed lot, with which the plot was sown. (D.M. Simpson)

HEAT CANKER (Non-parasitic). One field was slightly affected at Duchess, Alta.

## MANGEL

CERCOSPORA LEAF SPOT (C. beticola) was heavy in two fields at Chatham, Ont. It was general, but mostly light, at Cap Rouge, Que. To judge from specimens received from Halifax, N.S. this leaf spot caused a loss of half the foliage, with probably some reduction in yield.

BLACK LEG (Phoma Betae). An appreciable outbreak as a leaf spot occurred at Kentville, N.S.

CROWN GALL (Phytomonas tumefaciens). Traces occurred in a few fields in Queens county, P.E.I.

CROWN and DRY ROT (?boron deficiency). Traces only were present this season in Queens county, P.E.I.

STRANGLE (undetermined) affected severely 75% of the plants in a field in Queens county, P.E.I.; 15% of the affected plants recovered, following a light application of nitrate of soda. (R.R. Hurst)

## SUGAR BEET

RHIZOCTONIA (Rhizoctonia Solani). Inspection of harvest beets at sugar beet factories at Picture Butte and Raymond, Alta. indicated that injury caused by R. Solani was practically absent. (G.B. Sanford)

## SORGHUM

BACTERIAL LEAF SPOT (Phytomonas Holci). This leaf spot was slight to moderately severe on sorghum, proso millet, Japanese millet, broom corn and Sudan grass at Morden, Man. It was slight on sorghum at St. Agathe and general but slight at Brandon (W.L. Gordon). It caused slight damage on sorghum at Fredericton, N.B.

## SOY BEAN

BACTERIAL BLIGHT (Phytomonas glycinea). All varieties were slightly to moderately affected in the plots at Lethbridge, Alta. It was severe at the University Farm, Fort Garry, Man. Infection was severe on Wisconsin Black, Kobott, Manitoba Brown, and Agate Edible at Morden, while Number 47 and Mandarin were almost free from infection. It was severe on Manitoba Brown growing in a low spot in the field, while a trace occurred on Kobott at Lennoxville, Que.

MOSAIC (virus). The variety Manitoba Brown was moderately affected at Olds, Alta.

## SUNFLOWER

WILT (Sclerotinia sclerotiorum). Odd plants were infected at Morden, Man., while the crop was moderately affected at Brandon. An odd diseased plant was found here and there in a field at Ste. Anne de la Pocatiere, Que.

A head rot due to S. sclerotiorum was common and caused slight to moderate damage in September in the variety plot at the University, Saskatoon, Sask., after some late rains. The rot often extended several inches down the peduncle. Strangely enough no wilting of plants due to basal rot was observed. (T.C. Vanterpool)

RUST (Puccinia Helianthi) caused a trace to severe damage according to the variety in the University plot, Saskatoon, Sask. A moderate infection occurred at Indian Head. Infection was severe at Winnipeg, Foxwarren and Morden, Man., and the plots were ruined by rust at Brandon. Observations were made in late August.

## CULTIVATED GRASSES

AWNLESS BROME GRASS (Bromus inermis)

Leaf Blotch (Septoria bromigena) caused moderate damage in 3 fields examined in Sask.

Ergot (Claviceps purpurea) was much less common on awnless brome grass, as well as on Agropyron, Elymus, wheat, barley, and rye at Winnipeg, Man., than in recent years. (A.M. Brown)

CRESTED WHEAT GRASS (Agropyron cristatum)

Heterosporium sp. was growing profusely on leaves and stems of sickly plants from a diseased patch in zone 3, Sask. Whether the fungus was parasitic or saprophytic is unknown.

ITALIAN RYE GRASS (Lolium italicum)

Stem rust (Puccinia graminis). A trace occurred in the plots at Morden, Man.

KENTUCKY BLUE GRASS (Poa compressa)

Rust (Puccinia Poae-sudeticae) was fairly general at Saanichton, B.C. in March.

ORCHARD GRASS (Dactylis glomerata)

Leaf Spot (Mastigosporium album) was general on all strains of orchard grass at Agassiz, B.C. on May 18. The spots occurred on

leaves, stems, and sheaths, with withering of the leaf tips in the more advanced stages.

Brown Stripe (Scoletotrichum graminis) was slight on all strains at Agassiz, B.C.

TIMOTHY (Phleum pratense)

Stem Rust (Puccinia graminis) was general on Waldron Early, Boon and Commercial 361 at Agassiz, B.C. Infection was severe in 3 fields at Picher Creek and on some strains in the plots at Edmonton, Alta. Stem rust was variable at Macdonald College, Que. It was also recorded at Cap Rouge. While stem rust is general in P.E.I., some strains of timothy under test at Charlottetown are highly resistant to rust. (R.R. Hurst)

Leaf Spot (Heterosporium Phlei). A trace was recorded at Agassiz, B.C., and a slight infection at Edmonton, Alta. It was quite prevalent in timothy stands in York county, N.B.

Powdery Mildew (Erysiphe graminis). A slight infection was found at Edmonton, Alta.

WESTERN RYE GRASS (Agropyron tenerum)

Smut (Ustilago bromivora) affected 40% of the heads in a field at Vermilion, Alta. A moderate infection was recorded at the Swift Current Station, Sask.

WILD RICE (Zizania aquatica)

Ergot (Claviceps purpurea) was collected at Lac du Bois, Man., on Oct. 2, 1938 by W. Williams. This is the first record on this host for Manitoba, although the sclerotia of the fungus are preserved in the Herbarium from Keene, Ont.; Shediac, N.B., and Amherst, N.S. Attention is drawn to an interesting account of ergot on wild rice published by Miss Faith Fyles, at one time a member of the Division, in Phytopathology 5:186-192. 1915. Dr. W.F. Hanna, who communicated the specimens wrote as follows on Oct. 7:

"Ergot on wild rice has become more or less of an agricultural problem in Manitoba this year and some concern is felt over the amount of ergot encountered. For years the Indians in northern Manitoba have collected wild rice for food, but the product has not had a great market value. However, this year it appears that the American crop of wild rice was a failure, due, I believe, to high flood waters which killed out the plants.

Consequently American buyers have come up to Manitoba seeking a supply of wild rice and are offering very good prices - up to about sixty cents a pound. This has created quite a boom in the wild rice district and both Indians and others are busily engaged in harvesting it. Aeroplanes are even being employed to freight the grain from northern lakes to the railroad."

LAWN GRASS

Snow Mould (Fusarium niveum) was quite severe in Washington bent grass at Summerland, B.C.

Stem Rust (Puccinia graminis Phlei-pratensis). A test plot of lawn grass (Poa sp.) was very severely infected by this rust at the University Farm, Fort Garry, Man. (A.M. Brown, M. Newton and T. Johnson)