II. DISEASES OF FORAGE AND FIBRE CROPS

ALFALFA

COMMON LEAF SPOT (Pseudopeziza Medicaginis) was general both on Vancouver island and in the Okanagan valley, B.C. Light infections were noted in 6 out of 12 fields surveyed in Alta.; at Meadow Lake and Tisdale, Sask.; and at Brandon, Man. Traces to moderate infections were reported widely in Que.; and in York county, N.B. It may cause some defoliation.

YELLOW LEAF BLOTCH (Pseudopeziza Jonesii). A trace was found at Brandon, Man.

DOWNY MILDEW (Peronospora aestivalis) was present in varying amounts on Vancouver island and in the Fraser River valley, B.C. Of all the varieties at Agassiz it most seriously affected Lytton. It was also severe on this variety in the Laboratory plots at Edmonton, Alta., and to a lesser extent in the experimental plots at Lacombe.

ROOT ROT. Isolations from a few diseased plants from the interior of B.C. were identified by Dr. G.B. Sanford as Pleonodomus Meliloti. A Wilt attributed to Sclerotinia sp. also caused slight damage to alfalfa at Saanichton and Duncan, Vancouver island; it was worst where the crop was heavy and lodging. A survey was made on May 17 of the varieties grown at the Experimental Station, Lethbridge, Alta. for Root Rot caused by Cylindrocarpon, Fusarium, Sclerotinia, etc. Damage was most severe in non-hardy varieties as the following list shows: trace in Registered Grimm, Ontario Variegated, and Hardistan; slight in Kansas Common, Ladak and Utah Common; moderate in Lytton; and severe in California Common and Arizona. Root rot also caused moderate damage at Lacombe.

STEM CANKER and LEAF SPOT (Stagonospora Meliloti). As stem canker it caused slight damage in a field in zone 2, Alta. and as a leaf spot at Indian Head, Sask.

MOSAIC (virus). A trace was found in 1 field in zone 2, Alta.

WITCHES' BROOM (Cause undetermined) affected from 1 to 20% of the plants in the irrigated section, Cariboo county, B.C., being worst in older fields. The affected plants are dwarfed and bushy.

COMMON CLOVER

COMMON LEAF SPOT (Pseudopeziza Trifolii). Slight to moderate infections were reported on red clover from Que., N.S. and P.E.I. It was also general on clover in N.B.

POWDERY MILDEW (Erysiphe Polygoni) was reported on clover in N.B., on red clover in P.E.I., and on red and alsike in Que.

RUST (Uromyces Trifolii) was reported on red clover from B.C., Que., and P.E.I.; on alsike from B.C., Que., and N.S.; and on white clover from Man., Que., and P.E.I. The aecia were collected on alsike clover at Ste. Anne de la Pocatière, Que., on May 31, and on white clover in Bellechasse county on August 4. Infections were sometimes moderate to heavy.

SOOTY BLOTCH (Cymadothea Trifolii (Killian.) Wolf) was found on red clover in B.C., and P.E.I. and on alsike clover in Que. Although the disease is general, it causes little damage. F.A. Wolf, as a result of his studies (Mycologia 27:71. 1935) has erected a new genus Cymadothea for this fungus, and has reduced the name Dothidella Trifolii used in the last few reports to synonymy.

ANTHRACNOSE (Kabatiella caulivora) lightly infected red clover in a field in zone 10, Alta.

STAGONOSPORA LEAF SPOT (S. Meliloti) was reported on alsike clover at Ste. Anne de la Pocatière, Que.

ROOT ROT (Sclerotinia sp.) caused light damage in one field in zone 2, Alta.

MOSAIC (virus) was general on red clover in the orchards in Salmon Arm district, B.C. In plots of red clover at Macdonald College, Que., and at Fredericton, N.B. as high as 75 and 95% of plants respectively were affected with Mosaic. In clover fields, however, the percentage of affected plants was around 10-20%.

CERCOSPORA LEAF SPOT (C. zebrina) lightly infected alsike at Indian Head, Sask.

DOWNY MILDEW (Peronospora Trifoliorum) caused slight damage to clover in Prince and Queens counties, P.E.I.

SWEET CLOVER

MOSAIC (virus) slightly affected one field out of 3 surveyed

in zone 2, Alta. A few severely affected plants were observed at the Experimental Farm, Brandon, Man.

LEAF SPOT and STEM CANKER (Stagonospora Meliloti). Light infections of the leaf spot were observed in a field in zone 13, Alta.; at Indian Head, Sask.; Cypress River, St. Claude, St. Francois Xavier, and the Experimental Farm, Brandon, Man. At the latter place a few plants were severely dwarfed from stem canker.

DOWNY MILDEW (Peronospora Meliloti Syd.) occurred on several varieties in the Laboratory plots, Edmonton, Alta. Although it appeared to have spread from a near-by plot of Lytton alfalfa, the pathogen is considered, for the present, to be distinct from P. aestivalis.

CORN

RUST (Puccinia Sorghi) lightly infected the lower leaves of corn at Indian Head, Sask. It moderately infected field corn at Charlottetown, P.E.I.

SMUT (Ustilago Sorghi). A single plant was found smutted in zone 8, Alta. in 1935. It was observed once previously when it was collected by Dr. W.C. Broadfoot at the C.P.R. Farm, Brooks, Alta. in 1929. (G.B. Sanford)

Smut was moderate to severe on 20% of the plants at the Experimental Station, Morden, Man., and was general at the Experimental Farm, Brandon. Smut affected a trace to 2% of the plants at widely scattered points in Que.; a trace in the plots at Fredericton, N.B.

FLAX

RUST (Melampsora Lini) Traces were found at Benito and the Experimental Farm, Brandon, Man., and a moderate infection at Winnipeg.

WILT (Fusarium Lini) slightly affected 4 fields out of 6 examined in Alta. Flax affected with wilt was sent in from Nokomis, zone 9, Sask. to the Saskatoon Laboratory.

BROWNING (Polyspora Lini) caused slight damage at the Experimental Station, Beaverlodge, Alta. (W.C. Broadfoot)

LEAF SPOT (Cause unknown). A trace was found in Cypress at Beaverlodge, Alta.

HEAT CANKER (Non-parasitic). What may have been this disease caused a trace of damage in a field in zone 8, Alta.

FOX-TAIL MILLET

DOWNY MILDEW (Sclerospora graminicola). A trace was present on Siberian millet at Indian Head, Sask.

MANGEL

RUST (Uromyces Betae (Pers.) Lev.) heavily infected the leaves of mangels late in the season in the Saanichton district, B.C., about 2 miles away from where it was originally found on sugar beet. Although the foliage was severely affected it did not appeat to reduce the yield. (W. Jones)

CERCOSPORA LEAF SPOT (C. beticola)slightly to heavily infected the leaves on Vancouver island and in the Fraser River valley, B.C., being somewhat heavier on the mainland. The average damage was 6% (W. Jones). It was also present in the Forage Crop plots, Ottawa, Ont., and at Lennoxville, Que. It was only severe on the older leaves.

STRANGLE (Cause unknown) was found affecting 50% of the plants in a field at Lampley Prairie, B.C. in June, when the seedlings were about 6" high. The root was shrunken at the junction of the leaves to the crown, sometimes to a thin thread. Diseased seedlings transplanted into pots containing sterilized soil made little growth. The cause was physiological or virus. (W. Jones)

In a ¼ acre of mangels examined on October 9, in Northumberland county, N.B., 1-2% of the plants were stunted, apparently by Armillaria mellea, which was fruiting abundantly adjacent to stunted plants. (J.L. Howatt & S. Clarkson)

DAMPING OFF (Rhizoctonia sp., Fusarium sp., Phoma sp.) was severe in seed plants in the northern counties in N.B. and along the St. John River valley. However, due to later environmental conditions (dry weather, etc.) and retarded germination, a fair yield of mangels was harvested. The above mentioned organisms were associated with the damping-off. (J.L. Howatt & E.M. Taylor).

HEART ROT (Non-parasitic) was found in mangels in the plots at Kentville, N.S., but none was present in the limed borate plots and in one of the unlimed borate. In the seedling stage a

damping-off and a canker were present in all but the lime borate and the unlimed manganese sulphate plots.

SUGAR BEET

CERCOSPORA LEAF SPOT (C. beticola) was general in the Fraser valley and more prevalent there than on Vancouver island, B.C. Leaf infection ranged from 80-100%; damage 10%. (W. Jones) It caused a trace of damage in zone 2, Alta.

In a varietal plot in Essex county, Ont., Cercospora leaf spot was severe, many leaves dying and drying up. Infection was also common on the petioles. Some varieties seemed to be more resistant than others. It was also prevalent and widespread in sugar beet fields in Essex county. In the Forage Crop plots at Ottawa this leaf spot was heavy on most varieties. The Cercospora resistant strain, developed by the Great Western Co., produced very vigorous plants, and although some plants were heavily spotted, it appeared to be less severely affected than most varieties. However, the disease developed so unevenly in the four replicates due to inequalities in the ground that it was impossible to discover any clear cut differences. No Cercospora leaf spot was found at Kapuskasing, Ont.

In the plots at L'Assomption, Que., U.S. No. 1 showed only a trace, while some were severely affected. Here, again, the disease was worst in a slight depression running through the plot.

The leaf spot heavily infected a plot at Fredericton, N.B.

BLACK LEG (Phoma Betae) caused in general, only slight damage mostly on the leaves in the Saanichton district and at Agassiz, B.C. In one field where the beets were being grown for seed, it caused nearly 10% damage. As a leaf spot it was severe on the lower leaves of some plants in a seed plot at Morden, Man. In a field plot a trace was present on all varieties. It was also moderately prevalent in the plots at Kapuskasing, Ont.

RUST (Uromyces Betae (Pers.) Lev.) was first observed in the Saanichton district, B.C. on July 24 on sugar beets being grown for seed. The foliage was heavily infected and probably suffered to some extent. It was found on the 14 varieties grown at Saanichton: infection ranged from 60-90% on the foliage. It later spread to mangels and garden beets in the district in a radius of approximately 2 miles. A few rusted plants were also found at Agassiz. (W. Jones) This is the

first report of beet rust in Canada, although it is known in California and Oregon. Incidentally samples of seed imported from Europe were found to carry a heavy spore load of both urediniospores and teliospores.

HEART ROT (Non-parasitic). A trace was found in York county, N.B.

A few plants suspected of being affected with CURLY TOP (virus) were found in a variety plot in Essex county, Ont. (G. C. Chamberlain)

SOY BEAN

MOSAIC (virus) moderately affected soy beans at Morden, Man.; a trace was also present at Winnipeg. A single plant was found at Ottawa, Ont., but about 2% of the Mandarin plants in the plots showed "a bronzing of the young leaves produced by a brown discoloration of short segments of the veins and large splotches on the older leaves produced by a lace-like yellowing or browning of the veins". (J.B. Kendrick and M.W. Gardner, Jour. Agr. Res. 27:91-98. 1924) These symptoms are said to be associated with mosaic. Sometimes only one shoot of the plant was visibly affected.

BACTERIAL BLIGHT (*Phytomonas glycinea*) was reported on Manitoba Brown from Indian Head, Sask. Manitoba Brown was moderately affected in the Cereal plots, Ottawa, Ont., while Mandarin was relatively free except when growing close to a susceptible variety. Infection was reported as follows at Macdonald College, Que.: severe, Vilno Poland; moderate, Quebec 92, Manitoba Brown; slight, Brooks Poland, Quebec 537, Mandarin, Wisconsin Black; very slight, O.A.C. 211, Hudson Manchu. At L'Assomption, Manitoba Brown was moderately affected and no blight was found on A.K. Harrow and "I" varieties.

DOWNY MILDEW (*Peronospora manshurica* (Naoum.) Syd. ex. Gäum. = *P. Sojae* Lehm. & Wolf) was quite general on seedlings at the Experimental Station, Harrow, Ont. (2974) (G.C. Chamberlain). It has been reported as far north as Indiana, but not previously in Canada.

CURLY TOP (virus) severely affected 15-20% of the soy bean plants at Summerland, B.C. The disease was determined by Dr. B. L. Richards (H.R. McLarty). This is the first report on this host for Canada.

SUDAN GRASS

BACTERIAL LEAF SPOT (Bacillus Sorghi) infected Sudan grass moderately at Indian Head and Swift Current, Sask.; slightly at Brandon, Man.; and was present on Sudan grass and Early Amber fodder cane at Kentville, N.S.

SUNFLOWER

WILT (Sclerotinia sclerotiorum) caused 20% damage in one field in zone 1, Alta.; a trace at Morden, Man., and 5% damage to Mammoth Russian at Brandon. It affected 10% of plants in a field at Ste. Anne de la Pocatière, Que. In 1934 and 1935 as high as 85% of the plants were affected, causing the stems to fall over and making it impossible to use a binder. (E.Campagna)

DOWNY MILDEW (Plasmopara Halstedii) was prevalent at Ste. Anne de la Pocatière, Que.; plants attacked in the seedling stage remain dwarfed.

RUST (Puccinia Helianthi) was reported as follows: moderate to severe on the lower leaves at Indian Head, Sask.; moderate infection at Morden, Man. and a trace at Brandon; moderate infections at Ste. Anne de la Pocatière, Que.

CULTIVATED GRASSES

AWNLESS BROME GRASS (Bromus inermis)

Leaf spot (mostly Septoria bromigena) caused a light infection in a field in zone 10, Alta.; it was widespread in cultivated fields and on roadsides in southern Sask.; and was general along roadsides through Man., infection being slight to severe.

Blotch (Helminthosporium Bromi) slightly infected this grass along roadsides at Fannystile and St. Claude, Man.

Ergot (Claviceps purpurea) caused a trace to slight infection of 95% of the volunteer plants about Winnipeg.

Bacterial blight (?) caused a light infection in a field in zone 13, Alta.

CRESTED WHEAT GRASS (Agropyron cristatum)

Ergot (Claviceps purpurea) was reported as follows: a trace, Fraser valley, B.C.; light infection, Beaverlodge, Alta.; light infection, Ottawa, Ont.

Stem rust (Puccinia graminis) caused slight damage at Indian Head, Sask.

ITALIAN RYE GRASS (Lolium italicum)

Eye spot (Ovularia Lolii) was fairly general in the Fraser

valley and on Vancouver island, B.C.; damage was slight.

KENTUCKY BLUE GRASS (Poa pratensis)

Rust (Puccinia Poae-sudeticae) was fairly general in yards about Edmonton, Alta.

Powdery mildew (Erysiphe graminis) was heavy on every plant of strain Aberyswyth Bp 89 while strain Bp 90 was free on May 31, in the Forage Crop plots, Ottawa, Ont. It was also present on the Guelph strain and a Swedish strain, but absent from the Ottawa one. (L.E. Kirk and I.L. Conners)

ORCHARD GRASS (Dactylis glomerata)

Rust (?Uromyces Dactylidis Otth) was heavy on the second growth in plots at Kentville, N.S.

Powdery mildew (Erysiphe graminis) slightly affected this grass on Vancouver island and in the Fraser valley, B.C.

Brown stripe (Scolecotrichum graminis) was of general occurrence on Vancouver island and in the Fraser valley, B.C.

Purple leaf spot (Mastigosporium album Riess. var. muticum Sacc.) moderately infected orchard grass in the Fraser valley, B.C. (W. Jones). This is a new disease to Canada.

PERENNIAL RYE GRASS (Lolium perenne)

Eye spot (Ovularia Lolii) was fairly general in the Fraser valley, and on Vancouver island, B.C.

RED TOP (Agrostis alba)

Stem rust (Puccinia graminis)was moderate to severe in pastures at Kentville, N.S. (J.F. Hockey)

TIMOTHY (Phleum pratense)

Stem rust (Puccinia graminis) was reported as follows: slight infection in zone 2, Alta.; at Hadashville, and Winnipeg, Man.; infection none to 75% according to the strain in Sept. 1934 at Macdonald College, Que., stem infection being 0-35%; very common on the second growth, Kings county, N.S.; slight infection on volunteer plants, P.E.I.

Smut (Ustilago striaeformis). Abundant infection at Beauséjour, slight at Tyndal and a trace at Winnipeg, Man.

Ergot (Claviceps purpurea) affected 10% of the plants in patches at Winnipeg, Man.

Brown stripe (Scolecotrichum graminis) slightly infected timothy in one field in zone 10, Alta. and was common at Meadow Lake, Sask.

WESTERN RYE GRASS (Agropyron tenerum)

Stem rust (Puccinia graminis) collected at Red Jacket, Sask.; it caused slight damage at Indian Head. Traces were found at Brandon and Winnipeg, Man.

Smut (Ustilago bromivora) was reported as follows: a trace found once in zone 10, Alta.; moderate damage at Swift Current, Sask.; two clumps affected at Winnipeg, 10% of the plants smutted at Brandon, Man.; traces present in plots, Ste. Anne de la Pocatière, Que.

Ergot (Claviceps purpurea). Traces found at Red Jacket, Sask.; and Winnipeg, Man.

Head blight (Fusarium culmorum). Trace in some plots, Brandon, Man.

Powdery mildew (Erysiphe graminis) was fairly general in areas of rank growth, zone 10, Alta., but the damage was nil.

TURF

Brown patch (Rhizoctonia Solani) appeared suddenly in the Forage Crop test greens, Ottawa, Ont., about July 20. The Colonial bents showed large patches with dark borders and light brown centres. These bents were the worst affected, but some spots were visible in Washington bent. Isolations from diseased plants gave typical cultures of R. Solani and the disease disappeared rapidly upon treatment. (R. Hamilton and I.L. Conners) The disease was also reported affecting golf greens near Lennoxville, Que. by Mr. F.S. Browne. Bichloride of mercury was applied with excellent results.