II. DISEASES OF FORAGE AND FIBRE CROPS

ALFALFA

BLACK STEM (Ascochyta imperfecta). Leaf and stem infection was trace to slight in 11/106 fields examined in central Alta. It was more prevalent in southern Alta., infection being estimated as 11-tr. 16-sl. 3-mod./60 fields. Infection ranged tr-sl. in the variety plots at Lethbridge (M.W. Cormack). Infection varied greatly from area to area in Sask., being very severe in wooded areas east of Tisdale and light in areas west of White Fox, where clearing is extensive (H.W. Mead). A severe infection of black stem rendered worthless for seed a crop of alfalfa at Swan Lake, Man. The severity of the attack was probably due to the fact that in 1947 the alfalfa straw was allowed to remain spread over the field after the crop was threshed (W.A.F. Hagborg).

A heavy infection was present in the row plots of Grimm, where the growth was heavy and lush at the Agricultural School, Kemptville, Ont., but it was less prevalent in the pasture and hay mixture plots. Infection was also moderate to severe on Grimm alfalfa at the C.E.F., Ottawa, and caused considerable yellowing and defoliation; pycnidia containing mature spores were present on 30 July (R.J. Baylis). Black stem was heavy in a field of alfalfa at Hespeler; almost the whole field was dead early in July; winter injury may also have been a factor (J.D. MacLachlan). Although traces of black stem were present on most varieties at the Station, Ste. Anne de la Pocatière, Que., the Indian varieties were more heavily infected, some plants being virtually destroyed (A. Payette).

WINTER CROWN ROT (low-temperature basidiomycete). Damage from winter crown rot in Alta. was estimated as follows:

District	Fields Examined	Fields Damaged				
		Tr.	Sl.	Mod.	Sev.	Total
		%	%	%	%	%
Northern Alta.	49	4	41	47	6	98
West-Central Alta.	38	11	37	47	-	95
Clover Bar	68	10	60	30	-	100
Southern Alta.	60	17	68	10	-	95
All Districts	215	11	54	31	1	97

Winter crown rot was very prevalent and caused about the usual amount of damage in the different districts. As in previous years, the damage was most severe in the northern and central areas. In southern Alta. partial rotting of the crowns resulted in weakening of the plants in most fields examined (M.W. Cormack).

Winter crown rot on single plants or in small to large patches was present in all districts of northern Sask. that grow alfalfa. On account of the scattered nature of the infection the damage was not severe. In areas not previously examined for winter crown rot, damage was severe at Scott at the end of plots next to the north side of a hedge; at Big River large patches extending several feet from the grass borders were entirely killed (H.W. Mead).

BACTERIAL BLIGHT (Corynebacterium insidiosum). A severe infection was found in one field near Grand Forks, B.C.; the alfalfa was dying out (G.E. Woolliams). The damage from bacterial wilt in alfalfa fields examined in Alta. was estimated as follows:

District	Fields Examined	Fields Damaged Tr.	Sl.	Mod.	Sev.	Total
		%	%	%	%	%
Northern Alta.	49	-	2	2	-	4
West-Central Alta.	38	8	5	3	-	16
Clover Bar	68	13	22	8	-	43
Southern Alta.	60	13	39	33	12	97
All Districts	215	9	19	13	3	44

Bacterial wilt was found in additional fields in west-central Alta., but it did not show any increase in the Clover Bar district, east of Edmonton. In southern Alta. moisture conditions were particularly favourable for the development of the disease during the early part of the season and there was a noticeable increase in infection in stands only 2 and 3 years old. In a variety plot planted at Lethbridge in 1945, the damage ranged from extremely severe in Grimm to a trace in Ranger and other wilt resistant varieties (M.W. Cormack). Only the irrigated area at North Battleford, Sask., (P.D.S. 27:23) was resurveyed in 1948; although the field is infested throughout, less damage was evident this year because conditions were favourable for the growth of alfalfa. An extensive survey covering 30 fields in north-east Sask. in areas not previously visited failed to reveal the presence of wilt (H.W. Mead).

Bacterial wilt was observed in several fields in Essex and Kent Counties, Ont., and it is probably the cause of a "running out" of stands of which farmers have complained, the stands becoming unprofitable about three years from seeding (J.T. Slykhuis).

ROOT ROT (Cylindrocarpon Ehrenbergi) caused slight damage to a field near Lethbridge, Alta. (M.W. Cormack). C. Ehrenbergi was isolated from 70% of the plants damaged by winter crown rot in the north-east areas of Sask. Although the crown rot organism was apparently the primary cause, further decay of the root was due to C. Ehrenbergi (H.W. Mead).

DOWNY MILDEW (Peronospora aestivalis) was prevalent on D.U. Puits (French variety); La Pampa, Buenos Aires, Rio Nigra (Argentine strains); and Ranger in the trial rows at Saanichton, B.C., whereas the disease was not observed on Grimm, Rhizoma and Bahia Blanca (Argentine strain) (W. Jones). Downy mildew was found quite frequently in most sections of the B.C. Interior (G.E. Woolliams). Infection was slight in 2 fields in central Alta. and ranged tr.-mod. in the alfalfa nurseries at Lethbridge (M.W. Cormack).

YELLOW LEAF BLOTCH (Pseudopeziza Jonesii). Severely infected fields were found in the Torch River area, and near White Fox, Sask. Defoliation was severe by 20 July - and the sporonema stage was abundant. On 20 Aug., immature perithecia and ascospores were present on the dark, curled leaves still attached to the plant (H.W. Mead). A moderate infection was observed in a field of Canauto in Carleton Co., Ont. (V.R. Wallen).

COMMON LEAF SPOT (Pseudopeziza Medicaginis) was reported as follows: infection severe on Grimm, moderate on La Pampa and other Argentine strains and Rhizoma, slight on D.U. Puits, a French variety, at Saanichton, B.C. (W. Jones); prevalent on Rhizoma, U.B.C. plots, Point Grey (H.N.W. Toms); infection 33-sl. 22-mod. 3-sev./60 fields examined in southern Alta., where it was unusually prevalent late in the season; unreported from central or northern Alta. (M.W. Cormack); infection general by July in Sask., but damage slight as checked by dry weather (H.W. Mead); quite general in Essex and Kent Counties, Ont., especially in late summer and caused considerable defoliation in some fields (J.T. Slykhuis); infection moderate at the Station, Ste. Anne de la Pocatière, Que., but great variation in the amount of infection from plant to plant (A. Payette); mod.-sev. infection with sl.-mod. defoliation in rod rows at Fredericton, N.B. (J.L. Howatt); general infection noted in a field in Queens Co., P.E.I. (R.R. Hurst).

STEMPHYLIUM LEAF SPOT (S. botryosum) was general in a field at Ladysmith, B.C., causing yellowing of leaves; no other leaf spot was present (W. Jones). Traces were observed on nearly every variety at Ste. Anne de la Pocatière, Que. (A. Payette).

WITCHES' BROOM (virus) was quite prevalent around Lytton and Lillooet, and the odd plant was affected in a field at Shuswap, B.C., (G.E. Woolliams). A few plants were found affected in 2 stands in central Alta. (J.E.J. Thomson, J.B. Lebeau). Trace found in an old field east of Tisdale, Sask. (H.W. Mead).

YELLOWS (undetermined virus). A trace was found in a field at the Station, Fredericton, N.B. The affected plants were stunted and the numbers of leaves and stems were reduced. The leaves showed a yellowing of the margins and interveinal areas and were reduced in size. The stems exhibited a yellow or red coloration. In some instances only one or two stems were affected. The diseased stems usually wilted and died prematurely. The virus was transmitted by grafting to healthy alfalfa plants (D.J. MacLeod).

YELLOWS (boron deficiency) caused slight to severe damage at Shuswap, Chase, Sorrento and Salmon Arm, B.C. (G.E. Woolliams).

YELLOWS (cause undetermined) caused damage as follows: 5-tr. 8-sl. in 38 fields examined in west-central Alta. (J.E.J. Thomson, J.B. Lebeau).

SWEET CLOVER

STEM CANKER (Ascochyta caulicola). Infection was 2-tr. 8-sl. 2-mod./13 fields examined in southern Alta. (M.W. Cormack).

BLACK STEM (Ascochyta Meliloti). Infection was 1-sl. 1-sev./13 fields in southern Alta. It was also severe in roadside stands near Scandia (M.W. Cormack). Black stem infection was light to moderate on first year stands of both white and yellow clover in Essex Co., Ont., but it was less prevalent than last year (J.T. Slykhuis).

WINTER CROWN ROT (low-temperature basidiomycete). Damage was 5-sl. 4-mod. 1-sev./17 fields of red clover examined in west-central Alta. Several of the affected stands were sown in fields in which alfalfa had previously been damaged (M.W. Cormack). The disease caused slight damage in one field of clover near Melfort, Sask. (H.W. Mead).

STAGONOSPORA LEAF SPOT (Leptosphaeria pratensis (S. Meliloti). Infection was slight in 2 of 13 fields examined in southern Alta. (M.W. Cormack). A moderate infection was observed in one field of yellow sweet clover in Essex Co., Ont. (J.T. Slykhuis).

PHYTOPHTHORA ROOT ROT (P. Cactorum) caused extensive damage in April and May to fields of white and yellow sweet clover in Essex and Kent Counties, Ont. Damage varied from a few scattered plants to patches with nearly every plant killed or severely injured. In some fields 75-90% of the plants were killed. The disease occurred chiefly on the heavier soils (J.T. Slykhuis).

PSEUDOPEZIZA LEAF SPOT (P. Medicaginis). Infection was slight in a field near Scandia, Alta. (M.W. Cormack). This leaf spot was quite common in 1948 on both white and yellow sweet clover in Essex and Kent Counties, Ont., and in some fields caused considerable defoliation of the lower leaves (J.T. Slykhuis). Although the Pseudopeziza on Melilotus has been referred to P. Meliloti Sydow (P.D.S. 21:19, 22:21, and 23:20) examination of material submitted by Dr. Slykhuis revealed that it was not distinct morphologically from P. Medicaginis. For this reason we prefer to use the latter name for the sweet clover pathogen even if it is confirmed that it is distinct biologically from the Pseudopeziza on Medicago (cf. P.D.S. 14:21-22) (D.B.O. Savile).

SCLEROTINIA ROOT ROT (S. Trifoliorum). A few white sweet clover plants were infected and killed in areas where red and alsike clover were attacked in Kent Co., Ont. (J.T. Slykhuis).

YELLOW MOTTLE (probably virus). In most fields in Essex Co., were present plants of white and yellow sweet clover that were affected with yellow mottle; their growth was often stunted (J.T. Slykhuis).

COMMON CLOVER

SOOTY BLOTCH (Cymadothea Trifolii). A moderate to heavy infection developed in the late fall on a plot of alsike clover sown last spring in Essex Co., Ont. (J.T. Slykhuis, D.B.O. Savile). Infection was heavy on new seedings of alsike and white clover, slight on Ladino white clover and a trace on red clover in the plots, C.E.F., Ottawa (R.J. Baylis). A moderate infection was recorded in a block of Leon red clover at O.A.C., Guelph (J.D. MacLachlan).

POWDERY MILDEW (Erysiphe Polygoni). Infection was sl. in 2 fields of red clover in central Alta. and sl.-mod. in the plots at Lethbridge (T.R.D.). Light infections of powdery mildew were noted in June; later in the summer and early fall the disease was general in Essex and Kent Counties, Ont., and some fields were quite heavily infected. The very dry summer was condusive to its development (J.T. Slykhuis). A light to moderate infection was noted about Guelph (J.D. MacLachlan). Powdery mildew was general after the first cutting and the infection was severe on red clover in the Ottawa Valley, but there was also some infection on alsike and white clover. The disease was much more prevalent than in 1947 (R.J. Baylis).

ANTHRACNOSE (Kabatiella caulivora). Infection was 4-tr. 3-sl. 1-mod./17 fields of Altaswede red clover examined in west-central Alta. (J.E.J. Thomson, J.B. Lebeau). The disease was quite general in several fields of red clover in Essex Co., Ont., in May (J.T. Slykhuis). A slight infection was found on red clover in June in the plots, C.E.F., Ottawa. Further spread was apparently checked by dry weather (R.J. Baylis).

COMMON LEAF SPOT (Pseudopeziza Trifolii). A trace was observed on Ladino white clover at the Station, Ste. Anne de la Pocatière, Que. (A. Payette).

SCLEROTINIA ROOT ROT (S. Trifoliorum) caused severe damage in patches in a field of red and alsike clover in Kent Co., Ont. (J.T. Slykhuis). This root rot destroyed 20% of the plants of red clover, alsike clover and alfalfa in one area of the plots, C.E.F., Ottawa, in May and the average damage was about 5%. Elsewhere in the district the disease caused little damage (R.J. Baylis).

STEMPHYLIUM LEAF SPOT (S. sarciniaeforme). A moderate infection was observed in a field of red clover in Essex Co., Ont. (J.T. Slykhuis). In a specimen sent for confirmation, roughly half the lesions were those of this leaf spot and the other half were those caused by Cercospora zebrina (D.B.O.S.).

RUST (Uromyces spp.). An exceptionally heavy infection of U. Trifolii caused severe loss in hay value of a field of alsike clover in Essex Co., Ont. A moderate infection (U. fallens) was fairly general on red clover in late summer and early autumn (J.T. Slykhuis). Rust infection was heavy on red and alsike clover and caused considerable defoliation in the plots, C.E.F., Ottawa (R.J. Baylis). Rust infection was moderate to heavy on a block of Alon alsike clover at O.A.C., Guelph; stem lesions were abundant (J.D. MacLachlan). Traces of rust were present in a field of red clover near Charlottetown, P.E.I. (R.R. Hurst).

MOSAIC (virus). Symptoms of mosaic were observed on occasional plants of red clover in many fields in Essex Co., Ont., but in one field a considerable portion of the plants were affected (J.T. Slykhuis). A trace of mosaic (Trifolium virus 1) was found in 5 fields of red clover in York Co. and one in Queens Co., N.B. (D.J. MacLeod).

WITCHES' BROOM (virus). A clover plant showing symptoms resembling witches' broom of alfalfa was found in the Cariboo, B.C., by Dr. J.B. Munro. On alfalfa the disease is fairly common in the interior (W.R. Foster). This disease has previously been reported on clover in B.C. (P.D.S. 12:27) and Alta. (P.D.S. 27:27).

YELLOWS (undetermined virus) affected a trace to 1% of the red clover plants in fields in Carleton, York, Sunbury, Queens and Westmorland Counties, N.B., and caused considerable damage. The affected plants were stunted and the number of stems and leaves greatly reduced. The stems had a faint reddish coloration and an enlargement of the nodes. The leaves showed a marked yellowing of the marginal and interveinal areas. In some plants only one or two stems were affected. The diseased plants usually presented a staring, upright appearance. The crowns and roots usually became necrotic and as a result the plants wilted and died prematurely. The virus was transmitted by grafting to healthy red clover plants. Attempts to transmit the virus by means of the leaf hopper, Macrosteles divisus, were unsuccessful (D.J. MacLeod).

BUCKWHEAT

YELLOWS (Callistephus virus 1) was general and severe on tartarian buckwheat in Carleton, York, Sumbury, Queens and Westmorland Counties, N.B. (D.J. MacLeod).

CORN

SMUT (Ustilago Maydis). In a planting at the University farm, Winnipeg, Man., 50% of the plants bore smut galls (B. Peturson). Smut infection was moderate about Guelph, Ont. (J.D. MacLachlan).

FLAX

Prof. T.C. Vanterpool, University of Saskatchewan, Saskatoon, Sask., has summarized his observations in "Flax Diseases in Saskatchewan in 1948."

Among the flax diseases the severe epidemic of rust in south-eastern Sask. was of great local importance. Another destructive disease was stem rot or canker caused by several fungi singly or in combination. In many instances the cankers centred on black rust lesions. A severe epidemic of stem break and browning occurred in an area east of the Quill Lakes, where in some fields over 50% of the stems broke over--the heaviest damage ever recorded. In western Sask. flax diseases were negligible and low yields were due to drought and other causes. Seed from the 1948 crop is unusually free from internal infection except that from east of the Quill Lakes. In most areas flax ripened under dry, cool conditions.

RUST (Melampsora Lini). Not since 1942 has flax been rusted over wide areas of Sask. In that year, the rust-susceptible Bison was replaced by the more resistant Royal. In the intervening years, rust was absent or generally light on Royal, but in five of the six years, as the P.D.S. reports point out, a moderate infection developed in the occasional field or in low places where the stand was thick. Rains in July and low rates of evaporation during the summer provided conditions favourable for severe rust infection of Royal in the southeastern part of Sask., a triangular area with Rocanville (north) Carnduff (south) and Weyburn (west) at the apices. Infection dropped rapidly west of the 'rust area', the rainfall being lower during July, but northward along the Manitoba boundary rust damage varied from moderate to slight. Because of late sowing and dry surface soil cereals and flax emerged irregularly and stands were uneven.

Both early and late stands suffered severely from rust. The early stands were usually thick and rust pustules were very heavy on the main stem. During the latter half of August the rust lesions became infected by species of Fusarium, Alternaria, Septoria and Polyspora to produce a stem rot or canker. Affected plants tended to lodge and the stems turned a dirty grey to brown or black. In late, thin stands the rust developed chiefly on the fine branches and pedicels; stem canker was infrequent.

It was estimated in the extreme south east that flax yields were reduced by 50 to 75%, primarily by rust and secondarily by stem rot. From data largely supplied by Mr. H.M. Holm, Agricultural Representative for the South-Eastern Crop District (No. 1) it is estimated that Royal averaged 5 bu. per acre and Victory 12 bu. per acre under heavy rust conditions; in a non-rust year these varieties yield practically the same. As 35% of the flax acreage for Sask., or 200,000 acres, was in District No. 1, loss from flax rust in 1948 is conservatively estimated at over $5,000,000. On account of the susceptibility of Royal the Sask. Cereal Variety Committee has recommended that Dakota be grown in this District in the place of Royal. (Dakota is resistant to the races of flax rust so far isolated in Canada, but several fields of Dakota in western North Dakota were reported to have rusted in 1948 because of new races of rust. Such strains are not likely to prove troublesome in Canada in the next year or two. I.L.C.).

STEM BREAK and BROWNING (Polyspora Lini). Lesioning of the cotyledons was heavy in all fields examined between Elfros and Wadena, east of the Quill Lakes, but it was not found elsewhere in northern Sask. on the seedling survey. In mid-August a severe infection was reported from Elfros. When the field was visited on 6 Sept. over 50% of the plants were broken over, and stem and boll lesioning was conspicuous. The disease was generally severe in the area where lesioning of the cotyledons had been present on the seedlings, but rapidly became less destructive to the west and north. In southeastern Sask. a moderate infection was found at Kipling but only scattered traces were recorded elsewhere; again it was absent on the open prairie. That the late seed infestation in the Elfros-Mozart district in 1947 was a potential menace to the 1948 crop was forecast (P.D.S. 27:28). Farmers in the infested area have been advised to obtain fresh flax seed from further west where the disease was absent. The disease is favoured by the cooler and more uniformly moist conditions in eastern and northeastern Sask. Polyspora Lini was abundant on dead stems of Linum Lewisii along the Wadena-Elfros highway and may have contributed to the infection of cultivated flax.

PASMO (Septoria linicola). In 1946 and 1947 slight to moderate infections were found late in the season in Crop District No. 1 with an occasional trace reported further north. Contrary to expectations, no pasmo spores were found in specimens of rusted flax until the last week of August. Fifty samples collected during a field survey made 6-10 Sept. through the principal flax growing areas revealed, on microscopic examination, that pasmo was less severe and S. linicola was sporulating less freely than in the previous 2 years. Only slight to moderate infections were found on Viking, a variety susceptible to pasmo. However, pasmo is spreading northwards through the eastern park belt, spores being found on samples collected at Humboldt.

BROWN STEM CANKER (Alternaria linicola). At long last heavy infections of A. linicola have been found on flax in the field. At the end of August affected samples were collected by Dr. H.W. Mead at Love and Pas Trail in north-eastern Sask. These specimens showed light to dark brown cankers surrounding the stems and particularly abundant on the upper half of the plants. The cankers were ½-2" long and frequently coalesced. Above the cankers the top third of some plants were dry and had turned pale brown. The large spores typical of A. linicola were found occasionally in canker scrapings. When portions of affected stems were surface disinfected and plated over 65% yielded Alternaria, more than half of which were A. linicola: the other 35% were mainly cultures of Fusarium spp.

From observations made during the September survey and subsequent examination of the samples collected it was evident that cankers might develop independently or centre about rust lesions. Isolations from cankers of the latter type yielded, depending on the district, Fusarium spp., Alternaria linicola, Septoria linicola and Polyspora Lini. Moreover, the brown stem canker caused by A. linicola, sometimes with S. linicola or P. Lini associated, was also frequently found. In fact A. linicola predominated in isolates of brown stem canker, which was common throughout the eastern park belt from Love to Carnduff. In this area it was also much more frequently associated with rust telia than were Fusarium spp.

SEEDLING BLIGHT (Rhizoctonia Solani, etc.) was not conspicuous in fields in north-central Sask.; it was, however, generally distributed through the flax plots at the University and continued to cause death of seedlings until well into mid-summer. Moreover R. Solani comprised 25% of the isolates from 100 plants from each of 3 fields showing severe late root rot. Reduction in yield averaged 35%. Late root rot was most severe in two flax fields on barley stubble. R. Solani should no longer be regarded as only a damping-off parasite of flax; under favourable conditions it may continue to attack the plants until maturity.

DIE-BACK or TOP BROWNING (heat and drought). On the open prairie flax ripened uniformily and the whole stem gradually turned brown with very little of the die-back symptoms. Although soil moisture was low, summer temperatures were generally uniform. It appears that the sudden onset of high temperatures when the flax is ripening, as has occurred in previous years, may be one of the chief causes of die-back symptoms.

MISCELLANEOUS. A distinctive white spotting and stunting of young flax plants was observed in an area where a straw-pile had been burned. As the season advanced the plants recovered, the late growth being normal. Flax was sown in pots of the soil in the greenhouse; the seedlings developed normally.

Flax plants with crooked, severely distorted roots were found in soil bordering cracks at Saskatoon. Plants showing similar symptoms were received from Swift Current, Leader and Fenton.

2,4-D Dust Injury (P.D.S. 25:31) on flax roots was clearly recognized in a sample from near Regina. Conspicuous bends, buckles and S-shaped twists on the stems about 1/3 to ½ of their length from the ground was another type of injury generally distributed in 2 fields; the plants were otherwise well developed.

?Phosphorus Deficiency. Flax plants in areas through a field at Floral, near Saskatoon, exhibited a striking blue-green sheen when blown by the wind. The soil was of light texture and uneven in colour and showed evidence of former drifting. Phosphorus deficiency is suggested in these areas where subsoil is exposed.

Heat Canker was insignificant in flax which emerged late and escaped a hot spell the first week of June.

Selenophoma Branch Spot (S. linicola). Not a single specimen was collected this year.

Water Blister (unbalanced water relations) was present on flax stems in the Irrigation Nursery, Saskatoon.

Special reports covering two surveys in Man. and one preharvest survey embracing parts of all three prairie provinces were prepared by W.E. Sackston. They have been combined into a single report.

The largest flax acreage on Manitoba's history yielded a record crop in 1948. Early spring rains delayed seeding and dry weather early in June slowed up emergence. However, precipitation was well above normal and dry frost-free weather extended from mid-August into October, enabling most of the late flax to mature a good crop.

Three flax disease surveys were made in Man. in 1948. These were the seedling survey, 21-25 June, the mid-season survey, 12-29 July including southeastern Sask., and the fall survey 30 Aug.-11 Sept. covering the three prairie provinces.

SEEDLING BLIGHT (Rhizoctonia Solani, Fusarium spp., etc.). Conditions appeared ideal for severe seedling blight in Man. in 1948, but the expected outbreak did not develop. Severe losses were confined to isolated cases. Two 50 acre fields, of Royal and Dakota respectively, had to be plowed down because 80-100% of the plants were killed by R. Solani. Several reports of severe damage were received, but where poor or irregular stands were found they were due in most cases to poor emergence. Thin stands seen on the early survey were often greatly improved by mid-July although the plants were in all stages from seedling to bloom. R. Solani, Fusarium spp. and Alternaria spp. (mostly A. tenuis), were the principal fungi isolated from dead or diseased seedlings. Nematodes were present in many of the cultures.

LEAF SPOTS. A trace of leaf spot was found in 20 fields out of the 200 examined in the first two surveys; in 8 fields infection ranged 5-75%. Mostly non-sporulating strains of Alternaria were isolated. Several colonies of Fusarium, one of Helminthosporium sativum and one of Polyspora Lini were recovered from field samples. Colletotrichum Lini was isolated from plants grown from Ottawa seed in the variety plots, Winnipeg. Infection was extremely severe on Pusa and several other Indian varieties, causing stem canker, boll blight and seed discoloration as well as leaf spot. C. Lini was abundant in all tissues of Pusa flax received from the C.E.F., Ottawa, Ont., and from the Station, Morden, Man., when platings were made.

WILT and ROOT ROT (Fusarium oxysporum f. Lini, Rhizoctonia Solani). Traces of wilt and root rot were found in 21 fields examined in Man. in July, and 2% infection in two. R. Solani was isolated from over half the specimens plated; F. oxysporum f. Lini was isolated in pure culture from only one collection; Fusarium spp., including F. oxysporum, were present in about half the samples. Other organisms isolated were: Helminthosporium sativum one collection, Alternaria spp. from most specimens, and miscellaneous fungi, with nematodes in several plates. All collections were from southern Man.

Pure cultures of F. oxysporum f. Lini were isolated from wilted flax plants received from growers and others in Man. along with other Fusarium spp. in several lots. R. Solani was isolated in pure culture from dead plants in a patch where root rot was severe at the University.

Very little wilt or root rot was evident during the preharvest survey. Infection was tr. in 9 fields and 5% in one out of 90 examined in Man.; tr. in 2 and 2-5% in 2 out of 45 examined in Sask.; tr. in 7 and 10% in one out of 30 in Alta. R. Solani and Fusarium spp. were isolated from samples collected in all provinces. These two fungi and Alternaria sp. were isolated from one trace sample in Sask. and F. oxysporum f. Lini from another. F. oxysporum f. Lini was isolated from wilted plants collected at the Station, Lethbridge, Alta.

RUST (*Melampsora Lini*)[1] and STEM ROT (*Fusarium* spp. and *Alternaria* spp.). For the first time since 1942 rust was the most important disease of mature flax. The outstanding feature of the rust epidemic of 1948 was the severe damage it caused to Royal. It has been demonstrated by B. Peturson, of the Winnipeg Laboratory and by others that Royal flax in the seedling stage is susceptible to most forms of flax rust common on the prairies. In the mature stage Royal develops appreciable resistance and suffers little from rust attack. Because of delayed spring seeding and emergence in the rust area of Man. and south-eastern Sask. and the moist warm weather in July and early August the flax remained succulent and susceptible when weather favoured rapid development of rust. Rust infection alone was heavy enough to cause serious damage, but the situation was aggravated by secondary invaders such as *Fusarium* and *Alternaria*, which entered the rust telia and spread out from them causing a brown discoloration or stem rot that extended for varying distances along the stems, girdling many of them and killing the tissues above the lesions.

Rust was found on volunteer plants of Royal in bloom near Clear-water on June 22. In July traces were found in 9 fields and light to moderate infections on 2-25% of the plants in 8 fields and on 50-100% of the plants in 12 fields. Nearly all the rusted fields were in southwest Man. and southeastern Sask. It was already more widespread and severe than in 1947.

The estimates of rust severity reported in the preharvest survey are based on telial infections on the stems. It is possible therefore that fields where only light telial infections were seen had suffered heavy uredinial infections on the leaves. Fifteen of 90 fields examined in Man. had no rust, but 13 of these were rust-resistant varieties such as Dakota, Rocket, etc. The two rust-free fields of Royal were in the northwest, near Gilbert Plains. Five of 45 fields examined in Sask. were free of rust; of these, three were rust-resistant varieties and two were in the dry southwest corner of the province. The only rust-free field of 30 examined in Alta. was dead ripe and had apparently escaped the disease.

Rust without stem rot was found in 23 fields in Man. The infections were trace to light in all but two fields, in which 50% of the stem area was rusted. Rust and stem rot affected traces to 10% of the stem area in 22 fields, 15-50% in 14 fields, and 55-100% in 16 fields. All the fields with more than 35% rust and stem rot infections were in the southwest part of the province. Losses were as high as 75% in some fields, and averaged 25-35% for the area. Where stem-rot infections were relatively light, most of the discoloration seemed to be on the basal part of the stems, with clean rust telia occurring on the upper stem tissues in some cases. Numerous reports were received from flax growers, and others to the effect that rust was heavy on Royal early in August in southwest Man., and that rust and stem rot reduced yields very severely.

Traces of rust without stem rot were seen in 12 fields in Sask., light telial infection with severe uredinial infection on green leaves was seen in 5 fields, and in one extremely late field rust was killing

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[1] F.J. Greaney in "Seedtime & Harvest" No. 209, Oct. 14, 1948, estimated that in 1948 the average loss in yield from flax rust in Man. was 10%. "On a crop the value of which in August was estimated at $40,000,000 this represents a cash loss to Manitoba of $4,000,000."

most of the plants. Rust and stem rot lesions covered traces to 15% of the stem area of plants in 20 fields from the Quill Lakes east and south. Traces of stem rot were seen on rusted plants in the irrigation nursery at the University, Saskatoon. In a mixed stand of Royal and Rocket near Alameda, 100% of the Royal was diseased and prematurely dead, while the Rocket was rust-free and just turning color. The survey did not cover the southeast corner of the province, from Alameda east, but numerous reports indicated that rust and stem rot infection in that area was extremely heavy and causing serious damage.

Rust infection ranged from trace to 15% of the stem area in 28 fields in Alta. Heavy telial infections, covering 50% or more of the stems, were seen in two fields. In one of these there was rusted combined flax straw from the preceding crop scattered through the field. Rust was killing plants in scattered patches. There were traces of stem rot associated with the rust; no stem rot was seen on rusted flax elsewhere in Alta. The other heavy infection occurred on Redwing in plots at the Lacombe Station.

Little rust was seen on Linum Lewisii in Man. in 1948, but heavy infection was seen on this species near Prud'homme, Sask.

PASMO (Septoria linicola) was not as conspicuous in 1948 as in 1947. Heavy infections were found in fields near Haywood, Man., on 15 Aug. By the time of the late survey, however, rust and stem rot were so severe on most of the rust-susceptible flax in southwest Man. and southeast Sask. that pasmo infections were difficult to determine.

Definite pasmo lesions were recognized on much of the severely rusted Royal but the pasmo was listed as "trace" wherever rust and stem rot accounted for much of the injury. Traces to 10% of the stem area were affected by pasmo in 48 fields in Manitoba, 15-50% in 14, and 60-90% in 13. Heavy pasmo infections were observed on rust-resistant varieties in the worst rust area, and also on Royal and Redwing in northwest Man., from Neepawa through Dauphin to Roblin. Reports of pasmo infection were received from Agricultural Representatives at Swan River in the north, and from Vita to Piney in the southeast, where no surveys were made.

Traces to 10% of pasmo were seen in 18 fields in Sask., and 25-50% in three. With the exception of University plots at Saskatoon and fields near Weyburn, Humboldt, and Misninger, all the pasmo infections were found in the "rust area". No pasmo was found in Alta.

STEMBREAK and BROWNING (Polyspora Lini). Two fields near Elfros, Sask., with stembreak affecting up to 35% of the plants were visited through the courtesy of Prof. T.C. Vanterpool. The break was not confined to the cotyledonary node but occurred at various levels up to two-thirds of the height of the stems. Traces to 2% of stembreak were found in four fields between Elfros and Yorkton, but P. Lini was not isolated from lesions on the stems. From 10-15% of the stems were broken over at various heights in a field near Hirsch; isolations yielded only miscellaneous fungi.

Traces to 10% stem browning were seen in 7 fields from the Quill Lakes to the Man. border, 25-50% in 4 fields, and 75% in 2. P. Lini was isolated only from the two fields near Elfros where stembreak was severe, and from one other field several miles east of Elfros. All the other brown stems plated yielded only Fusarium spp., Alternaria spp., and miscellaneous fungi similar to those isolated from stem rot associated with rust.

Traces of stem browning were seen in 8 fields in Alta., and from 1-10% in 3 fields. P. Lini was isolated from flax collected in fields near Edmonton and Vegreville, and from plots at Olds and Lacombe.

HEAT CANKER (physiologic) was not conspicuous in 1948 in Man. Traces were present in 20 fields; the heaviest damage seen affected only 5% of the plants, in 7 fields. One sample was received from a grower.

BOLL BLIGHT (cause unknown) was more severe in Man. in 1948 than in 1947. There was trace to 20% blighting in 28 fields, 25-35% in 36, and 40-65% in 13 fields. Severe blighting and stripping of the bolls was associated with heavy rust and stem rot infections in 11 of the 13 fields and with heavy pasmo infection in the other two. In Sask. there was 5-20% blighting in 12 fields, 25-35% in 24, and 45-50% in 2 fields, one of which showed severe drought injury. Boll blight was not severe in Alta. Traces to 20% occurred in 25 fields, and 25-35% in three fields. Rust was severe on the pedicels of plants in 2 of the 3 severely blighted fields.

MISCELLANEOUS. Chlorosis was conspicuous in many fields in the southern part of the Red River Valley, Man., in June. Scattered chlorotic fields were seen in July. In some cases chlorosis was severe over much of one field, but none could be found in an adjacent field of flax of the same age. Heat and Drought Injury caused some damage to seedlings in June. Severe injury of all plants was seen in July on large acreages of flax in very light sandy soil between Douglas and Shilo, Man. Traces of Stem Break were seen in July in 5 fields in Man. and one in Sask. Fusarium spp., Alternaria spp., miscellaneous fungi and nematodes were isolated from the tissues, but no Polyspora Lini. Breaking-over of the stems at the cotyledonary node was seen in one field of flax on peaty soil, and reported from another field, both in the interlake area of Man. The trouble was most noticeable in thin stands and at the edges of bare patches in the field. The breaks looked mechanical, and no known pathogens were isolated. Cutworms were reported in one of the fields, but according to an entomologist who examined the material, they were not responsible for the injury. Traces of 2,4-D Injury were observed in a few fields. No severe injury was seen except at headlands, although many of the fields examined had been treated. Top Discoloration involving the upper quarter to half of the flax plants was seen in 3 fields in Man., 7 in Sask., and 12 in Alta. Severe drought injury was seen in one field in Man. and two in Sask.

Other Observations

WILT (Fusarium oxysporum f. Lini) was severe in a variety test plot at Ste. Anne de la Pocatiere. The percentage of plants affected were: fibre varieties - Norfolk Queen 8.7**, Cascade 17.4**, Gossamer 54.6**, Cirrus 67.5*, Dominion 68.5*, J.W.S. 75.7, and Liral Prince 91.7; oil varieties - Dakota 6.2**, Red Wing 11.3*, Rocket 13.6* and Royal 26.7. In comparison with the most susceptible variety in each series the figures followed by ** were highly significant and by * significant. Wilt was observed in a few fields in the area, but infection was light. Samples were received from Soulanges Co., where 20% of the plants were reported affected (R.O. Lachance).

RUST (Melampsora Lini). Infection was 8-tr. 18-sl. 1-mod. 1-sev./32 fields examined in Alta., tr.-sl. in the variety plots at Olds and tr.-mod. at Lacombe. (T.R.D.). A 15% infection was observed on Red Wing at Innisfail; the growth was rank (G.B. Sanford). Rust was moderate to severe in a field of Liral Monarch at Ste. Anne de la Pocatière, Que.; a nearby field of Cirrus was free from rust (R.O. Lachance).

BROWNING (Polyspora Lini) was severe in patches in fields at New Norway, Alta. (G.B. Sanford, W.E. Sackston). Affected flax was received from Blackie where a moderate infection occurred (A.W. Henry).

BROOMCORN MILLET

SMUT (Sphacelotheca destruens (Schlecht.) Stevenson & Johnson, = Sph. Panici-miliacei (Pers.) Bubak). A light infection was present in a field at Tessier, Sask. (H.W.M.).

FOXTAIL MILLET

DOWNY MILDEW (Sclerospora graminicola) affected 15-20% of Early Foxtail Millet in the plots, Division of Forage Plants, C.E.F., Ottawa, Ont. Infected plants tillered excessively and bore sterile inflorescences. Yield was probably reduced 15-20% (W.R. Childers). It was also heavy on Setaria lutescens near Ottawa. The sporangial stage was plentiful (D.B.O. Savile).

MANGEL

LEAF SPOT (Cercospora beticola). A slight infection occurred about Guelph, Ont., on mangels and sugar beets (J.D. MacLachlan).

ROOT KNOT (Heterodera marioni). About 1% of the roots were found affected at harvest in the variety plots of the University, Point Grey, B.C. The spherical root knots yielded the nematode in abundance. (H.N.W. Toms, A.D. Baker).

BLACK LEG (Phoma Betae). The leaf spot phase was present on plants being grown for seed at Grand Forks, B.C. (G.E. Woolliams). The disease affected about 10% of plants in a field at Clyde River, P.E.I., causing a damping-off. (D. Robinson).

LEAF SPOT (Ramularia beticola) was generally distributed on the lower leaves of crops in the lower Fraser Valley, B.C.; damage slight (H.N.W. Toms).

CROWN ROT (boron deficiency). Two affected roots were brought to the laboratory, Charlottetown, P.E.I. (R.R. Hurst).

MUSTARD

WHITE RUST (Cystopus candidus). Infection was severe on occasional plants in several fields of cultivated mustard about Lethbridge, Alta., but most plants were not affected (M.W. Cormack).

SOYBEAN

The principal observations on diseases of soybean are contained in a report "Soybean Diseases in Southwestern Ontario in 1948" by A.A. Hildebrand.

As in previous years, surveys of soybeans in the southwestern counties of Ont. were carried out at intervals throughout the season. Most of the diseases that have previously been reported in the district were found again this year but none of them caused serious loss. However, BROWN STEM ROT (Cephalosporium gregatum Allington & Chamberlain) is causing some concern. In 1947, the disease was found only in a single planting of soybeans and on one variety only. In 1948, the disease was found to be of widespread occurrence on a number of varieties. In the laboratory plots at Harrow where, for the second year, soybeans followed soybeans, by mid-September up to 20% of the plants in some rows were more or less seriously affected. However, yield from these rows was just as high as from others with fewer infected plants and it is suggested that development of the disease did not take place until after the seeds in the pods were well filled out. Allington and Chamberlain (Phytopath. 38: 793-802, 1948) have shown that air temperatures are of critical importance in the development of brown stem rot. They report that air temperatures below 21°C. (70°F.) are essential for the rapid spread of the organism up the stem of the plant. At Harrow this season the maximum daily temperature during July and August exceeded 70°F., except for one period of about 48 hours. Consequently, though considerable inoculum may have been present, the disease had little chance to develop until the cooler weather of September. With the disease becoming widely distributed, it might well be destructive in a year with a cool August.

Other diseases noted in the course of the surveys include: MOSAIC (Soja virus 1); BUD BLIGHT (virus of tobacco ring-spot group); DOWNY MILDEW (Peronospora manshurica); BROWN SPOT (Septoria Glycines); BACTERIAL BLIGHT (Pseudomonas glycinea); POD and STEM BLIGHT (Diaporthe Phaseolorum var. Sojae); FUSARIUM BLIGHT (F. oxysporum f. tracheiphilum); a foot-rot from which Rhizoctonia was consistently isolated; and SUN SCALD (non-parasitic).

Other Observations

DOWNY MILDEW (Peronospora manshurica). Infection was severe on Capital; moderate on Richland, Goldsoy, and O.A.C. 211; and light on Mandarin, Kabott, Flambeau, Harman, Pagoda and Earlyana in the plots, O.A.C., Guelph, Ont. (J.D. MacLachlan). It was found at Ottawa for the first time, when a trace was observed on Capital (W.R. Childers, I.L. Conners).

BACTERIAL BLIGHT (Pseudomonas glycines). Infection was severe on Pagoda; moderate on Kabott and Goldsoy; and light on Earlyana, O.A.C. 211, Flambeau and Harman in the plots, O.A.C., Guelph, Ont. (J.D. MacLachlan). A light infection at Ottawa was confined to a few introduced varieties known to be susceptible. Spread was greatly restricted by subsequent dry weather in August (R.J. Baylis). Infection was light on Early Black Eye at Ste. Anne de la Pocatière, Que. (R.O. Lachance).

MOSAIC (virus). Slight infection observed on all varieties in the plots, O.A.C., Guelph, Ont. (J.D. MacLachlan).

SUGAR BEET

LEAF SPOT (Phoma Betae) was very prevalent on the stalks of the seed crop at Ladner, B.C. (R.E. Fitzpatrick).

LEAF SPOT (Ramularia beticola) caused appreciable defoliation in some fields of the seed crop at Ladner, B.C., just prior to harvest. As a result seed heads ripened unevenly (R.E. Fitzpatrick).

RUST (Uromyces Betae) caused a scattered infection in the variety plots, University, Point Grey, B.C. (H.N.W. Toms).

ROOT ROT. During the current season, more particularly towards mid-summer, sugar beets in a number of fields in southwestern Ont. exhibited symptoms that in the past have been ascribed to attack by Rhizoctonia Solani. When affected tissue from diseased beets was transferred to various solid nutrient media, including P.D.A., pure cultures of R. Solani were obtained with such consistency as to suggest that fungus as the causal organism of the disease. When, however, isolations were attempted by the water-culture method, Aphanomyces cochlicides developed just as consistently as had R. Solani when the solid media had been employed. The significance of this association of organisms is not yet understood but is about to be investigated. (A.A. Hildebrand).

SUNFLOWER

Observations on sunflower diseases in Man. are contained in a special report by W.E. Sackston.

A disease survey through the main sunflower area of Man. was made in mid-August with E.D. Putt, Cooperative Vegetable Oils, Ltd., Altona; W.A. Russell, Dominion Experimental Station, Morden; and H. Westdal, Dominion Entomological Laboratory, Brandon.

RUST (Puccinia Helianthi) was present in every field examined; it was the most prevalent sunflower disease in 1948, causing appreciable damage in some crossing blocks, but little in commercial fields. Rust infection was trace to light in 13 fields, moderate in 7, and heavy in 4. In crossing blocks the inbred female parent, S 37-388, was attacked much more heavily than the Sunrise parent, and in some fields of the hybrid variety Advance

plants of the inbred were severely damaged by rust whereas those of Advance showed only light infection. The variety Mennonite appeared to be more susceptible than either Sunrise or Advance. Late-season reports from Mr. Putt and Mr. Russell indicated that rust appeared to be causing yield reductions as high as 50% in some crossing blocks, but only 1-2% in commercial fields.

WILT (Sclerotinia sclerotiorum) was found in more than half the fields examined; in all but one field, however, there was only a trace to 1% of the disease. In one field near Carman, over 50% of the plants in 3 acres of a 30 acre field were killed by S. sclerotiorum. The sunflowers followed four successive good crops of field peas. Mr. Putt reported a field in the Altona area in which 60-70% of the stems in patches were killed by wilt, with an average infection of 25% for the field. Wilt was worst in fields, or portions of fields, where growth was heavy.

LEAF SPOT (Septoria Helianthi) was not seen at the time of the survey, but Dr. J.E. Machacek found traces of the disease in a foundation plot of Sunrise.

LEAF MOTTLE (cause unknown). An unidentified leaf mottle caused a trace to 1% infection in 5 fields. The mottle apparently starts on the lower leaves as an interveinal chlorosis, followed by necrosis. The affected tissue is sharply limited by the veins. As the disease spreads upward along the plant, the necrotic tissues tend to break out of the lower, earlier-diseased leaves, leaving them ragged and torn. Infected plants occurred singly, surrounded by healthy plants, and also in groups extending up to 20 feet along the row and across two or three rows. Affected plants seemed to be slightly shorter than healthy ones.

STUNT (cause unknown). An unidentified stunting, similar to that caused by systemic downy mildew infection, was present in trace amounts in 6 fields and up to 5% in patches in one. Affected plants were 6-18" high, with most about 12". The roots appear to be browner and more twisted than those of healthy plants; they pull out of the soil easily, and do not hold soil. No particular discoloration of the stem base was noted. Discoloration at the point of attachment of leaf petioles seemed to be more pronounced than at the base of dead leaves on non-stunted plants. Stem borers were present in all the stunted plants in the worst field; they were also present in healthy plants, but the infestation was much less. The number of leaves on stunted plants was approximately the same as on healthy ones, but the internodes were extremely short. The diameter of the mid-stem was greater than that of the basal or upper parts, making the stem appear spindle shaped. The heads on all affected plants were rigid and erect, while those on healthy plants were nodding. Chlorosis of the upper leaf surfaces was conspicuous, spreading laterally a short distance from the midrib and larger branch veins. The chlorosis was irregular in pattern, and did not appear on the lower leaf surface. Veins on the affected leaves were somewhat distorted, and the leaves tended to be rugose. No pathogen could be found associated with the diseased plants.

DOWNY MILDEW (Plasmopara Halstedii) was found on scattered plants in test plots near Rosenfeld. Affected plants were similar in appearance to those suffering from "stunt", save that downy mildew was present on the lower leaf surfaces, corresponding to the chlorosis visible on the upper surfaces. Not all the stunted plants in mildew patches were mildewed; it may be that much of the stunting seen was induced by systemic mildew infection but that the organism did not fruit for some reason.

POWDERY MILDEW (Erysiphe Cichoracearum). Trace infection was seen in sunflower plots at the University, Winnipeg, and "considerable infection" was reported on some of the later selections at Morden by Mr. Russell.

MISCELLANEOUS. Traces of a bacterial stem rot were found in two fields. Mr. Putt reported that the disease was severe in one field heavily infected by Sclerotinia wilt, and that like the wilt it was most common where the growth was heavy.

CULTIVATED GRASSES

AGROPYRON - Wheat Grass

Brittle Dwarf (Brachycolus tritici Gill) was severe on both fall and spring sown perennial wheat (Agropyron elongatum x T. aestivum var. Chinese) in the plots, University, Saskatoon, Sask. Many plants of both sowings were killed before heading. The aphid in all probability overwintered on the fall-sown plants. From some experimental work completed in 1948 it was concluded that (1) there is no indication that a virus is associated with the disease, but rather (2) the so-called brittle dwarf disease of wheat, barley, crested wheat grass and other grasses is caused by the western wheat aphid (T.C. Vanterpool).

Ergot (Claviceps purpurea). Heavy infection on perennial wheat (see above) in the University plots, Saskatoon, Sask. (T.C. Vanterpool). Infection was slight on A. repens near Willingdon, Alta., and trace to slight on A. Smithii in central Alta. (S.G. Fushtey). Trace on A. repens in Queens Co., P.E.I. (R.R. Hurst).

Take All (Ophiobolus graminis) moderately infected Agropyron-Triticum hybrids in the plots at Lacombe, Alta.; destroying many of the plants (T.R.D.).

Physoderma Blight (Physoderma graminis (Büsgen) A. Fischer ex von Minden) caused severe damage to wild A. repens bordering the plots, Division of Forage Plants, C.E.F., Ottawa, Ont. It was recognized from its similarity to the outbreak seen at Madison, Wis., and described by M.J. Thirumalachar and J.G. Dickson (Phytopathology 37:885-888. 1947) (W.R. Childers). The Ottawa material contained resting sporangia (23.5) 25-39 x (15.5) 19-32 microns, wall yellow brown to dark red brown, 1.5-2.2 microns. It agreed closely with Cladochytrium graminis Büsgen in Rabh.-Pazschke, F. Extra-Europ. 4117 on Dactylis glomerata. It is clearly distinct from Physoderma Agrostidis Lagerh. in Vestergren, Micromycetes rariores selecti 510 on Agrostis alba. In the Ottawa material the sporangia are abundant in the leaves and rhizomes and some were also seen in the cortex of the few remaining roots. This is the second report of the fungus for North America. Von Minden (Kryptogamenfl. d. Mark Brandenburg 5:404. 1911) cites A. Fischer as the author of the transfer of the species to

Physoderma, but in the cited work (Rabh. Krypt.-fl. 1(4):139. 1892) Fischer merely places Cladochytrium graminis in the subgenus Physoderma (D.B.O. Savile).

Basal Glume Rot (Pseudomonas atrofaciens). Slight infection on Agropyron-Triticum hybrids in the plots at Lacombe, Alta. (T.R.D.).

Stem Rust (Puccinia graminis) was a trace to heavy on A. repens in Queens Co., P.E.I. (R.R. Hurst).

Leaf Rust (Puccinia Clematidis). Trace to heavy infection on A. repens in Queens Co., P.E.I. (R.R. Hurst).

BROMUS - Brome Grass

Ergot (Claviceps purpurea). Slight infection on B. inermis at Lacombe and Delburne and moderate at Tofield, Alta. (S.G. Fushtey).

Leaf Blotch (Helminthosporium Bromi). Infection was slight in plots of B. inermis at Lethbridge and in several roadside stands in southern Alta. (M.W. Cormack).

Leaf Spot (Selenophoma bromigena). Infection moderate on B. inermis at Edmonton (J.D. Gilpatrick); moderate and general in roadside stands near Cowley, Alta. (M.W. Cormack). Infection variable on strains and varieties of B. inermis in the breeding nursery at Saskatoon, Sask. (H.W. Mead).

CYNOSURUS CRISTATUS - Crested Dogtail

Brown Stripe (Scolecotrichum graminis) was general on a lawn at North Saanich, B.C. (W. Jones).

DACTYLIS GLOMERATA - Orchard Grass

Bacterial Blight (Corynebacterium rathayi) has now spread throughout the main orchard at Ste. Anne de la Pocatière, Que.; infection moderate (A. Payette).

Ergot (Claviceps purpurea). Heavy infection along a fence row at Walkerton, Ont. (J.D. MacLachlan).

Powdery Mildew (Erysiphe graminis) was general on one strain at the Station, Saanichton, B.C. (W. Jones).

Purple Leaf Spot (Mastigosporium rubricosum). Infection general in fields in North Saanich, B.C.; considerable damage to a few strains at the Farm, Agassiz (W. Jones).

Stem Rust (Puccinia graminis). On a few plants along roadside, North Saanich, B.C. (W. Jones). Trace on the variety Oron at O.A.C., Guelph, Ont. (J.D. MacLachlan).

Brown Stripe (Scolecotrichum graminis). General on one strain at the Station, Saanichton, B.C. (W. Jones). Slight infection on the variety Oron at O.A.C., Guelph, Ont. (J.D. MacLachlan). Slight infection at C.E.F., Ottawa (W.R. Childers).

FESTUCA - Fescue

Bacterial Leaf Spot (Corynebacterium agropyri). Infection slight in a field of F. rubra at Turin, Alta. (M.W. Cormack).

Leaf Blotch (Helminthosporium dictyoides). Trace on F. elatior var. Mefon at Brampton, Ont. (J.D. MacLachlan).

Stem Rust (Puccinia graminis). Trace at Brampton, Ont. (J.D. MacLachlan).

PHLEUM PRATENSE - Timothy

Stem Rust (Puccinia graminis var. Phlei-pratensis). Observed on stands at Flatbush and Rossington, Alta. (A.W. Henry). Some volunteer timothy plants between rows of planted timothy var. Medon in a block at Brampton, Ont., but none observed in the rows of foundation plants (J.D. MacLachlan). Infection trace to heavy in Queens Co., P.E.I. (R.R. Hurst).

Brown Leaf Spot (Scolecotrichum graminis). Collected at Rossington, Alta. (A.W. Henry). Slight infection on Medon timothy at Brampton, Ont. (J.D. MacLachlan). Slight infection at C.E.F., Ottawa (W.R. Childers).

POA - Blue Grass

Ergot (Claviceps purpurea). Slight infection in some plantings of blue grass at Edmonton, Alta. (S.G. F shtey).

Powdery Mildew (Erysiphe graminis). Slight infection at Edmonton (J.D. Gilpatrick).

Stem Rust (Puccinia graminis). A trace on P. canadensis var. Canon at O.A.C., Guelph, Ont. (J.D. MacLachlan).

Leaf Rust (Puccinia Poae-sudeticae). Slight infection in some plantings of blue grass at Edmonton, Alta. (J.D. Gilpatrick).

Brown Stripe (Scolecotrichum graminis). Moderate infection mostly on the basal leaves of P. compressa var. Canon at O.A.C., Guelph, Ont. (J.D. MacLachlan). Infection was heavy in one ¼ acre block of P. compressa at C.E.F., Ottawa, completely browning the leaves (W.R. Childers).

LAWNS and TURF

Brown Patch (Pythium spp. and Helminthosporium sativum). Many new lawns were started in July and August at Saskatoon, Sask. Brown patches were conspicuous in many of these lawns. Pythium ultimum, P. arrhenomanes and H. sativum were isolated. Rhizoctonia Solani was not obtained (T.C. Vanterpool).

Brown Patch (Rhizoctonia) caused moderate damage to a lawn at Charlottetown, P.E.I. (D. Robinson).

Snow Mould (Typhula spp.) caused only slight damage to the greens and fairways of local golf courses about Ottawa, Ont., in March. Snow cover was unbroken throughout the winter and disappeared very quickly (within one week); both factors may have been responsible for the little damage from snow mould. Only Typhula spp. were isolated from diseased patches (R.J. Baylis).