II. DISEASES OF FORAGE AND OTHER FIELD CROPS

A. FORAGE LEGUMES

ALFALFA

BLACK STEM (Ascochyta imperfecta) was generally distributed in Alta.; infection was 25-tr. 36-sl. 9-mod. 1-sev./146 fields examined. In two fields leaf spot symptoms were sl. (J. B. Lebeau, E. J. Hawn). Infection was generally lighter and developed more slowly than in 1953 in Sask.; it was estimated to be 17-sl. 30-mod. 1-sev./48 fields examined. Defoliation was also less than usual (H. W. Mead). Sl.-sev. infections were general in Man. Sev. diseased pedicels and pods were observed in many fields; in this way the disease appeared to be limiting seed production (W. C. McDonald). In the 46 fields examined in Essex and Kent counties, Ont., the disease was sev. only in three-year-old stands although it was of wide occurrence (W. G. Benedict). Black stem was present in most fields examined in Kamouraska Co., Que.; infection was only tr.-sl. (R. O. Lachance).

WINTER CROWN ROT (low-temperature basidiomycete) was found scattered through n. and central Alta.; infection 3-tr. 36-sl. 12-mod. 6-sev. (J. B. Lebeau). Infection was 18-sl. 2-mod./48 fields examined in Sask. Both crown rot and winter injury caused death of plants, the diseased plants being intermingled with others killed by winter injury (H. W. Mead).

BACTERIAL WILT (Corynebacterium insidiosum). Damage was 33-sl. 4-mod. 2-sev./146 fields examined in Alta. The disease developed slowly in s. Alta. on account of the partial resistance of Ladak. No infected fields were observed in the Peace River District (J. B. L., M. W. C.). Very little of the disease was seen in s. w. Ont.; in one field in Kent Co. 15% of the plants were affected (W. G. Benedict). A sl. infection was seen on Grimm at the Experimental Station and on the farm of the School of Agriculture, Ste Anne de la Pocatiere, Que. (R. O. Lachance).

ROOT ROT (Fusarium sp.) affected about 20% of the plants in 2 fields in Kent Co., On.; elsewhere the disease was negligible (W. G. Benedict).

LEAF SPOT and ROOT ROT (Leptosphaeria pratensis (Stagonospora meliloti). Leaf spot infection was 4-tr. 3-sl./146 fields examined in Alta.; not observed in s. Alta. (J. B. Lebeau). Sl. infections of leaf spot were observed in scattered fields in Man. In one seed field in s. e. Man. the stems were blighted. The lesions on stems and pedicels were black bordered with white centres on which numerous pycnidia were visible. The pycnidia contained typical Stagonospora spores and the fungus was

isolated in pure culture. This phase of the disease has not been previously observed in Man. In addition the fungus has been found causing a crown and root rot during root rot surveys in recent years. The fungus was frequently isolated from discoloured vascular tissue. In plants collected at random in 3 areas in Man., the percentage of infected plants was greatest in the inter-lake region, much lower in s.e. Man. and least in the Red River Valley. The percentage of infected plants in 1951 was 3,2, and 0% and in 1952, 7, 1, and 0% respectively. The explanation for the differences appears to be due to the prevalence of inoculum from infected leaves. In the Red River Valley, alfalfa is grown for hay and leaf spot does not develop extensively, whereas the other two regions are seed-growing areas and leaf spot continues to develop throughout the season. As the organism is comparatively slow growing and is readily overgrown by other soil fungi when tissue plants are made on agar plates, a greater percentage of the plants may have been infected than was recorded. Pathogenecity studies on 3-month-old plants showed that the Man. isolates were capable of causing a crown rot and a reddish flecking of the vascular tissue as reported in Wisconsin and California (Erwin, D.C. Phytopathology 44:137-144. 1954). This disease has not been reported previously in Canada. In 1954, typical symptoms of crown rot was observed on scattered plants in 2 fields near Libau (W.C. McDonald). A trace of leaf spot was observed in 3 fields in Essex Co., Ont. in Sept.-Oct. and a trace of crown rot was recorded in one field in Kent Co. in May (W.G. Benedict).

DOWNY MILDEW (Peronospora aestivalis) was of sporadic occurrence in Alta.; infection was 3-tr. 4-sl. 1-mod. 1-sev./146 fields examined (J.B.L., M.W.C.). A sev. attack was observed in the plots at Swift Current, Sask. In affected plants, the internodes were shortened, leaflets twisted and rolled, stems swollen. Oospores, conidiophores and conidia were found. Different clonal lines differed in their susceptibility (H.W.M.). Downy mildew was general in Man. on account of the cool wet weather. Infection was 2-tr. 4-sl. 5-mod./31 fields examined. In a 1954 seeding at Morden 75% of the plants were infected (W.C. McDonald).

YELLOW LEAF BLOTCH (Pseudopeziza jonesii). Infection was 1-tr. 7-sl. 9-mod. 19-sev./146 fields in Alta.; infection this year was one of the severest on record (J.B.L., M.W.C.). The disease was observed in 20 out of 48 fields examined in Sask.; infection was sl. and less defoliation resulted than usual (H.W.M.). Infection was 9-tr. 3-sl. 1-mod./31 fields examined in Man.; the disease was particularly noticeable in an area n.e. of Winnipeg (W.C. McDonald). Yellow leaf blotch was general and was observed in 26/34 fields examined in Essex and Kent counties, Ont.; it was found regularly in stands ready for mowing. It caused considerable loss of foliage in some fields (W.G. Benedict). The disease was present in all 15 fields examined in Drummond Co., Que.; but infection was sl. (R.O. Lachance).

COMMON LEAF SPOT (Pseudopeziza medicaginis) was general in Alta.; infection was 22-tr. 40-sl. 16-mod. 5-sev./146 fields examined (J.B.L., E.J.H.). Infection was estimated to be 10-sl. 2-mod./48 fields examined in Sask. (H.W.M.). The disease was general in Man.; infection was 7-tr. 13-sl. 8-mod. 3-sev./31 fields (W.C. McDonald). This leaf spot was scarce and only a sl. infection was seen in two 4-year-old stands, which had been left to be ploughed under (W.G. Benedict). Infection was 14-sl. 1-mod./15 fields examined in Drummond Co., Que. (R.O. Lachance). A mod. infection was general at the Station, Ste Anne de la Pocatiere, (D. Leblond) and at the Station, Charlottetown, P.E.I. (J.E. Campbell).

CROWN BUD ROT (Rhizoctonia solani, Fusarium spp., etc.) caused sl.-mod. damage in 28 fields in s. Alta.; the disease develops rapidly after the first season of growth (E.J. Hawn).

STEM ROT (Sclerotinia sclerotiorum). Sclerotia were reported in samples of seed from Nipawin, Tisdale and Saskatoon, Sask. (H.W. Mead).

LEAF SPOT (Stemphylium botryosum) is most noticeable in September in Essex and Kent counties, Ont., when sl.-mod. infections are present in most fields (W.G. Benedict).

RUST (Uromyces medicaginis). Sl.-mod. infections were recorded in Sept.-Oct. in 21/33 fields examined in s.w. Ont.; the heaviest infection seen was in Gosfield North Twp., Essex Co. (W.G. Benedict).

CROWN WART (Urophlyctis alfalfae). A sl. infection was found at the Station, Saanichton, B.C., on creeping alfalfa strains developed at Swift Current. The disease was previously reported in B.C. at Vancouver (R. Turley, W. Jones).

MOSAIC (virus). A trace was found in 4 widely separated fields in Essex Co., Ont. (W.G. Benedict).

RING SPOT (virus). A tr. was seen in one 2-year-old field in Essex Co., Ont. (W.G.B.).

WITCHES' BROOM. Infection was mod. in a field n. of Grimshaw, Alta. (J.B. Lebeau).

YELLOWS (boron deficiency) was less sev. than usual in Kamouraska Co., Que.; precipitation had been heavy. In Drummond Co., the disorder was present but difficult to identify. In the Lake St. John district, Dr. G. J. Ouellet reported that the severest symptoms were observed at the Station, Normandin, on clay soil which had been over limed and showed a pH of 7.4 Red clover was also sev. affected. He also observed

yellows on sandy soil about Peribonka and Mistassini (R. O. Lachance).

WINTER INJURY was sev. in the plots at Saskatoon, Sask., in which plants were killed over large areas (H. W. Mead).

COMMON CLOVER

LEAF SPOT (Cercospora zebrina). Infection was sl.-mod. in 15/28 fields of red clover examined in s. w. Ont. The disease was present in one-and two-year-old stands in the fall, but was more severe in the latter (W. G. Benedict).

ANTHRACNOSE (Colletotrichum graminicola) sev. infected Altaswede red clover at Ste Anne de la Pocatiere, Que. (R. O. Lachance).

SOOTY BLOTCH (Cymadothea trifolii). Infection was so heavy on alsike clover in the greenhouse at Harrow, Ont., to constitute a pest especially on plants growing under crowded conditions (W. G. Benedict). Mod. infections were noted on alsike clover in single fields at Kentville, N. S. (D. W. Creelman) and at Hunter River, P. E. I. (J. E. Campbell).

POWDERY MILDEW (Erysiphe polygoni). Infection was 2-sl. 2-mod. 1-sev./25 fields of red clover and 1-tr./8 fields of alsike clover examined; affected fields were all in central Alta. (J. B. L.). At Lethbridge a sl.-mod. infection was noted on Lasalle red clover (M. W. C.). Powdery mildew was sl.-mod. on 12/28 fields in s. w. Ont.; it was generally more prevalent on 1st year growth (W. G. B.).

LEAF SPOT (Gloeosporium spadiceum). Most plants of red clover were affected in a field at St. Clement, Riviere du Loup Co., Que. (D. Leblond, D. B. O. Savile). This appears to be the first time the pathogen has been observed in Eastern Canada (I. L. C.).

ANTHRACNOSE (Kabatiella caulivora). Infection of 4-54. 7-sl. 1-mod. 6-sev./25 fields of red clover examined in n. and central Alta. (J. B. L.) and sl.-mod. in a stand at Lethbridge (M. W. C.).

LEAF SPOT (Leptosphaeria pratensis). Infection was tr.-sl. in 2 fields of alsike clover in central Alta. (J. B. L.).

LEAF SPOT (Pseudopeziza trifolii). Tr.-sl. infections were general on red clover throughout Kings Co., N. S. (D. W. Creelman).

LEAF SPOT (Stemphylium sarcinaeforme). A heavy infection caused defoliation on red clover in a hayfield at Aldergrove, B. C. in Sept. (H. N. W. Toms). Infection was 1-tr. 1-sl. and 1-mod./25 fields in central and n. Alta. (J. B. L.). Sl.-mod. infections were recorded in 5/11 fields examined in s. w. Ont. (W. G. Benedict) and a sl. infection

at Hunter River, P. E. I. (J. E. Campbell).

RUST (Uromyces fallens) infection was tr. -mod. in 7/28 fields of red clover examined in s. w. Ont. The uredinia were frequently nerviphilous. A sl. infection (U. trifolii) was also noted on alsike clover at Sombra (W. G. Benedict). A few pustules of rust were seen on Lasalle red clover at Charlottetown, P. E. I. (J. E. Campbell).

MOSAIC (virus) affected 1-5% of the plants in 5/28 fields of red clover examined in s. w. Ont. (W. G. Benedict). Mosaic (Trifolium virus 1) affected a tr. to 3% of the plants in 5 fields in York Co., N. B. (D. J. MacLeod).

PURPLE TOP (virus) was found affecting 8 plants in a field near Fredericton, N. B. Plants were dwarfed; stems and leaves were reddened and exhibited a tendency towards phyllody. The virus was transmitted from 3 plants to Bonny Best tomato by using dodder (Cuscuta gronovii). The symptoms in the tomato resembled those induced in this host by the potato purple-top virus. (D. J. MacLeod).

An unthriftness of Ladino clover has been observed at Ste Anne de la Pocatiere, Que., for the last few years. It appears to be associated with a phyllody condition. This condition has been attributed in Oregon to infection by a virus. The affected plants die. (R. O. Lachance).

RING SPOT (virus) was observed in 3 fields of red clover in Essex Co., Ont. In one 40-acre field near Cottam, nearly every plant was affected. Aphids were present in the field but when they were caged on healthy plants in the greenhouse they failed to transmit the virus. From studies made at Harrow, it is believed that the virus in red clover is a strain of the tobacco ring-spot virus (W. G. Benedict).

WITCHES' BROOM (virus). Two plants were affected in a field near Keswick, N. B. (D. J. MacLeod).

YELLOWS (Callistephus virus 1). Three affected plants were observed in a field near Fredericton, N. B. (D. J. MacLeod).

SWEET CLOVER

GREY STEM CANKER (Ascochyta caulicola) was rated as 2-tr. 3-sl. 2-mod. /13 fields in Man.; it occurred n. and n. e. of Winnipeg and s. of Brandon (W. C. McDonald).

BLACK STEM (Ascochyta meliloti) caused sl. damage in 5 fields in the Saskatoon and Tisdale areas, Sask. (H. W. Mead). The disease was rated as 4-tr. 3-sl. 4-mod. 2-sev. /13 fields examined in Man. In the 2 sev. infected fields n. e. of Winnipeg, the infection on pedicels, seed pods, and seeds appeared to be limiting the yield of seed (W. C. McDonald).

LEAF SPOT (Leptosphaeria pratensis). Infection was 2-sl. in central Alta. (J. B. L.) and 2-tr. 6-sl. in fields generally distributed in Man. (W. C. McD.). Stagonospora leaf spot was extremely heavy in May on both yellow and white sweet clover in Essex Co., Ont.; economic loss is slight because most of the crop is ploughed under for green manure. A tr. of leaf spot was observed on the current year's growth in October (W. G. Benedict).

ROOT ROT (Phytophthora cactorum). The growing of sweet clover has been abandoned in the n. and e. parts of Essex Co., Ont. on account of the disease. In May a few sev. damaged fields were found in May in s. w. Essex Co., but some excellent stands that were disease free were also seen. (W. G. B.).

COMMON LEAF SPOT (Pseudopeziza medicaginis) was general in Man.; infection was 7-tr. 3-sl. 3-mod./13 fields examined (W. C. McD.).

MOSAIC (virus). A few affected plants were found in 4/14 fields examined in Essex Co., Ont. (W. G. B.).

RUST (Uromyces hedysari-obscuri) was very heavy on a specimen of Hedysarum mackenzii sent in for identification from Whitehorse, Yukon, by Mr. J. Y. Tsukomoto. He stated that the plant has some value as a pasture crop for horses and cattle. Moose also graze on the plant. It appears that there is some interest in developing the plant as a cultivated forage crop in the Yukon (J. A. Parmelee). It may be pointed out that the rust, which has repeating aecia in place of uredinia, occurs on the different species of Hedysarum wherever they grow across Canada and the infection is often very heavy. Unless resistant plants could be selected out from the wild population, it is very likely that rust would greatly impair its value as a forage plant in some seasons (I. L. Conners).

B. OIL-SEED CROPS

FLAX

As in recent years, Dr. W. E. Sackston has included his observations in an account entitled "Flax Diseases in Manitoba in 1954".

Flax was sown late throughout much of Man. and Sask. in 1954 on account of a cold wet spring. Some fields failed to mature before freeze-up. The average yield for Man. was estimated at 9 bu. per acre. Diseases were of very little consequence in most fields. In 61 farm fields of flax examined during a survey in Man. and e. Sask. 17-20 August, the crop varied from pre-bud to ripe, and was in the green-boll stage in most fields.

RUST (Melampsora lini). There was practically no rust on flax in the area surveyed. The worst infection observed affected 10% of the leaves in a small patch, with the field rating only "trace". Four of the 61 fields had from one or two pustules, to traces of rust. All the rest, including a number of fields of Victory and other susceptible varieties were rust free. As rust developed well in inoculated plots at Winnipeg, freedom from the disease was apparently due largely to the widespread use of resistant varieties, with a consequent reduction in inoculum. Rusted Redwing flax was submitted from Fort Vermilion, Alta., and it was reported that rust infection was extensive there on other varieties as well.

SEEDLING BLIGHT, WILT, and ROOT ROT (Rhizoctonia solani). Seedling blight was conspicuous in plots at Morden in June. R. solani was isolated from affected seedlings. Traces of wilt and root rot were found in three fields, and 3% in one field. Again R. solani was isolated.

PASMO (Septoria linicola). Traces of pasmo were found in 13 fields, 5% in 1, 10% in 1, and 35% in 1. Leaf lesions were seen in a number of fields in which stem symptoms were not observed. The disease developed well in inoculated plots at Winnipeg.

BOLL BLIGHT (cause unknown) was not yet conspicuous at the time of the survey, on account of the lateness of the crop. There was no boll blight in 31 fields, traces in 3, 5-15% in 17, and 20-30% in 10.

FLORAL DEFORMITY (?aster yellows virus). This disease, (described in P.D.S. 33:36-38), was present in all but two fields. In one of these, the plants were only 8 inches high when examined, and in the other the crop was dead ripe. Traces were found in 41 fields, 1% in 10, 2% in 2, 3% in 1, 5% in 2, and 10% in 1 (late, reseeded). Specimens of the disease were brought in by farmers, and one was submitted from Lacombe, Alta.

MISCELLANEOUS. Severe damage from wind and soil drifting was reported from one field in Man. Top Discoloration affected a few plants in two fields, and 15% of one, all in light soil areas. Seedlings with symptoms resembling Heat Canker were submitted from an irrigated field near Tilley, Alta.

Prof. T.C. Vanterpool, University of Saskatchewan, Saskatoon, likewise contributed a special report on "Flax Diseases in Saskatchewan in 1954".

The moist, cool growing season was favourable for flax and yields were again above average. The estimated average yield was 10.3 bu. per acre or 5,317,000 bu. on 518,000 acres. Also, the area in flax was increased by 176,000 acres over last year's and was about equal

to the combined acreage in fall and spring rye. This increase in flax acreage was partly due to the late spring and partly to the fact that flax was not under a delivery quota.

In general, flax diseases were inconspicuous until late in the season when Alternaria blight and pasmo appeared widely scattered in the wooded and semi-wooded areas. Phoma foot rot has rarely been found under field conditions in Saskatchewan, but this year four fields showing slight amounts were found in north-central areas. Although stem and leaf rust of cereals was epidemic, flax rust was severe only on the few fields sown to susceptible varieties. Flax yellows, which was conspicuous in many areas last year, appears to be widespread and was sent in by farmers for the first time. Eight samples were received from localities as far apart as Estevan in the s. e. and Meadow Lake in the n. w. In the aggregate, losses from flax diseases were much less than one would have expected with the abundant rainfall.

RUST (Melampsora lini) was sev. on susceptible varieties, which are no longer recommended, but virtually absent on rust-resistant varieties. Thus, although stem and leaf rust were epidemic on cereals, the same could not be said for flax rust in spite of the fact that the season favoured flax rust development. Once again rust-resistant varieties have saved flax growers a great deal of money. Two instances may be cited which emphasize this point: (1) Some plots of Royal grown in rotation plots at the University became heavily infected with rust in the early seedling stage and were completely destroyed when the season was about two-thirds over; (2) in 1953, a farmer e. of Watson, grew Royal on fallow and obtained 27 bu. per acre on his first attempt at growing flax. In 1954 he sowed another fallowed field with his 1953 seed; this field became so heavily rusted that at the end of August he swathed his flax and later burnt it. There is now definite evidence that under certain conditions, spray or dust applications of 2,4-D may increase appreciably the damage caused by flax rust on susceptible varieties. Three such fields have been seen and similar claims have been made by several farmers. Stem Canker (Melampsora lini followed by Fusarium spp.) was very conspicuous on susceptible varieties (Dakota and Royal) at Scott, Saskatoon and Watson.

WILT (Fusarium oxysporum f. lini). No samples of wilt were sent in. Low temperatures kept the damage low in the Wilt Nursery.

SEEDLING BLIGHT (Rhizoctonia solani) was less prevalent than usual. In plots on fallow at the University where seedling blight has been troublesome in the last few years, it was present in sl. -mod. amounts in scattered spots. Cool, wet conditions do not favour the disease.

BROWNING and STEM BREAK (Polyspora lini). The relative scarcity of the disease during such a moist, cool season as 1954 is

difficult to explain as these conditions were thought to favour its occurrence. Only 4 reports worthy of note were recorded; these were one each at Wakaw, Saskatoon and Netherhill, and at Hilda, Alta. On account of wet weather no survey was possible in the n. e. Sask. where this disease is usually present.

YELLOWS (aster yellows virus, California strain) was found in all flax fields examined during a survey in September in an area extending from the Quill Lakes w. through Saskatoon to Rosetown and s. to Elrose. Infection ranged from a trace (two plants in a field at Kyle) to 5% (in a field w. of Kenaston). All experimental work to date points to the trouble being caused by the western strain of the aster yellows virus. Many of the fields most heavily infected with yellows were not sprayed with 2,4-D and were a quarter of a mile or more from the nearest sprayed fields. These observations and the fact that 2,4-D spraying has been general since 1947 rule out spray injury as a cause. This point is mentioned because 2,4-D injury on some plants is quite similar to yellows on the same plants. Flax yellows is widespread over the province, being found in areas as far apart as Tisdale (n. e.), Kyle (s. w.), Estevan (s. e.) and Meadow Lake (n. w.). The fact that 8 samples were sent in by farmers for the first time indicates that it is becoming conspicuous in many fields. Scarlet flax (Linum grandiflorum) and other species of Linum became naturally infected in experimental plots. Yellows has not yet been observed on wild flax (Linum lewisii) but this species was not grown with the others in the plots.

BASAL STEM ROT (Phoma spp.) Previously, foot rots caused by Phoma spp. have only rarely been encountered, but a form that causes sev. damage to germinating flax seed was known to be present in some years in the moister areas. This form, which is regarded as P. exigua, has been under study for some time. This year 4 fields, one each at Dafoe, Saskatoon, Asquith and Vanscoy, showed Phoma pycnidia in small numbers on the basal portion of plants also affected with pasmo. The Phoma pycnidia appear to be later or slower in maturing than the pycnidia of Septoria linicola. This fact has made isolation difficult with the material on hand. Observation over the last 15 years indicate that though highly pathogenic Phoma spp. may be thinly scattered over the moister areas. Normal conditions are too dry and perhaps too warm to favour their development. It appears that a succession of moist, cool years are necessary to ensure a build up of inoculum and widespread outbreaks of the disease.

BLIGHT (Alternaria linicola) appeared late in the season about the same time as pasmo in n. central Sask. where it caused stem, leaf and boll browning. Its distribution more or less coincided with that of pasmo, and both diseases frequently appeared on the same plants. Some 15 low-germinating flax-seed samples were secured from the Plant Products Seed Laboratory, Saskatoon, and tested for seed-borne fungi.

Five of these were heavily infested with A. linicola, one moderately and seven slight. Fusarium spp. and undertermined fungi were present in trace amounts, while no Septoria linicola or Polyspora lini appeared on the plates. It is difficult to assess the damage done to a ripening flax crop by A. linicola, but its effect on reducing the germination of seed samples is easily determined and is often considerable.

PASMO (Sphaerella linorum (Septoria linicola) was found this fall considerably further west than previously reported, probably as a result of the moist, cool weather prevailing throughout the season. In the few fields examined in the semi-wooded areas in n.-central Sask. around Saskatoon and as far w. as Scott pasmo was present in every one. The disease, however, appeared late in the season and, although it caused considerable stem discoloration in many fields, it seems to have had little effect on the filling of the seed. This view was also held by Mr. A. Kusch, Experimental Station, Scott. Pasmo was not found in flax around Rosetown nor in areas further south and west. It will be of interest to observe its distribution during the next few years. Many plants affected with pasmo also showed stem discoloration caused by Alternaria linicola (see above).

CHLOROSIS (lime-induced). This condition, which was favoured by the cold, wet spring, was found in spots in two fields near Asquith in which the trouble had not been previously observed. The plants recovered as the season advanced.

Other Observations

ANTHRACNOSE (Colletotrichum lini). A tr. infection was observed on Rocket and Stormont Gossamer L. 26 in the plots at Ottawa, Ont. (Mary E. Elliott).

WILT (Fusarium oxysporum f. lini) caused sev. damage to fibre flax at Ste Martine, Que., according to L. A. Cabana, Field Husbandry Division, Ottawa; the identity of the organism was confirmed by W. L. Gordon (M. E. E.). Wilt caused sev. damage in the variety plots at the Station, Ste Anne de la Pocatiere, Que.; some plots were so sev. damaged that they were not harvested. Av. infection in 4 replicates was: Cascade 39%, Stormont Gossamer L. 26 50%, Liral Dominion and Stormont Curies 73%, Wiera 75% and Liral Prince 80% (R. O. Lachance).

A browning of the stems affected 50-75% of the plants of Rocket, Stormont Gossamer and Liral Prince in the plots at Ottawa, Ont. Only Fusarium spp. developed on the stems when they were placed in a moist chamber (M. E. E.).

RUST (Melampsora lini) infection was 10-tr. 12-sl. 7-mod. 5-sev./46 fields examined. Most of the 30 fields examined in the Peace River area were infected (W. P. C., J. A. H. and A. W. Henry). Rust

was tr. -sl. on Liral Prince and sl. -mod. on Stormont Gossamer in the plots at Ottawa, Ont. (M. E. E.).

BROWNING and STEM BREAK (Polyspora lini). Browning infection was 3-tr. 6-sl./30 fields examined in the Peace River area, (W. P. C.) and a tr. of stem break was seen in a field at Vauxhall in s. Alta. (J. S. H.).

ROOT ROT (Pythium sp.). A tr. was found in a field at Creston, B. C. (J. S. Horricks).

ROOT ROT (Rhizoctonia sp.) Damage was 2-tr. 2-sl./14 fields examined in s. Alta. (J. S. H.).

PEPPERMINT

RUST (Puccinia menthae). A sl. infection was observed in the University plots, Vancouver, B. C. (H. N. W. Toms). Rust was abundant on cultivated peppermint at the school farm, Deschambault, Que. in mid-September. The rust was parasitized by Darluca filum (D. Leblond).

RAPE

WHITE RUST (Cystopus candidus) caused sev. distortion of the tips of the branches and curling and flattening of the stems in a few fields s. e. of Prince Albert, Sask.; oospores were abundant on the affected parts (T. C. Vanterpool).

DOWNY MILDEW (Peronospora parasitica) was common on rape in the Shellbrook area, Sask. where it has occurred for several years. It caused mod. damage in 10/15 fields. It causes a distortion of the panicle and no seed are formed on the affected parts (H. W. Mead).

STEM ROT (Sclerotinia sclerotiorum) was found causing mod. damage in 12/15 fields in Sask. Stems were bleached and soft and they usually contained sclerotia. Plant infected early set no seed. (H. W. Mead). Argentine rape was affected in plots at Arborg and Teulon, Man. At Arborg estimated infection was 1-5% over most of the plot area but it was 30-60% in a group of 6 sev. lodged plots, in which hemp nettle (Galeopsis tetrahit) was present. At Teulon infection was 2%. A local farmer, who sowed rape for the second year on the same land, stated that an appreciable portion of his crop resembled the infected plants in the Teulon plots (B. R. Stefannson, W. E. Sackston).

STERILITY (?aster yellows virus). Plants showing the symptoms described in 1953 (P. D. S. 33:41) were found in the plots of Argentine rape at Winnipeg and Altona, Man. (W. E. Sackston). Aster yellows was also found in the plots at Saskatoon, Sask. Unlike the description

of Sackston these plants had been bent over almost flat by rain and wind. Abnormal branches which were green and upright, had formed; the leaves were folded around the aborted inflorescence into bladder-like structures. Nearby weeds were also affected by yellows (H. W. Mead, T. C. Vanterpool).

SAFFLOWER

LEAF SPOT (Alternaria carthami Chowdhury, J. Indian Bot. Soc. 23:64. 1944) was observed on the leaves of many safflower plants in the Cereal Division plots, Ottawa, Ont. At first the spots were small, circular, yellowish-brown to brown. These spots tended to coalesce into elongate spots, which were a centimeter long when the plants were mature. The fungus was isolated from the spots. From the dimensions of the spores, the organism was identified as A. carthami Chowdhury rather than Macrosporium carthami Rodighin (cf. R. A. M. 19:115-116. 1940) (Mary E. Elliott).

GREY MOULD (Botrytis cinerea). Some of the heads of plants in the Cereal Division plots, Ottawa, Ont. were found to have turned brown. Affected heads placed for a day in a moist chamber consistently yielded B. cinerea (M. E. E.).

RUST (Puccinea carthami) was well established in the plots at Lethbridge, Alta., by mid-July. By the end of September infection was mod. on Indian, N8, and N6 x N8; sl.-mod. on N10, 2377, and 4033; sl. on 3614; and tr. on W. O. 14 (F. R. Harper, M. W. Cormack). Rust infection was uniformly heavy on safflower plants in the University plots at Winnipeg, Man. Seed for these plots came from the University of Saskatchewan, Saskatoon. Other plots, 20 feet away, sown to the same variety with seed grown at Winnipeg were relatively free of rust. Likewise, the safflower plots at the Morden Station, were almost free of rust except for several rows sown with seed from Saskatoon (W. E. Sackston). These observations confirm previous ones that the rust is largely spread from place to place by spores on the seed or debris with the seed. It would seem to be a simple matter to control the rust by treating the seed with a suitable fungicide (I. L. C.).

ROOT ROT (Pythium sp.) caused sl. damage in irrigated plantings at Lethbridge, Alta. A number of lines from the University of Saskatchewan appear highly resistant (F. R. H.).

HEAD BLIGHT (Sclerotinia sclerotiorum) was noted on all varieties under irrigation at Lethbridge, Alta. Damage was sl.-mod. on N10, N6 x N8, and 2377 (F. R. H.).

SOYBEAN

Dr. A. A. Hildebrand has summarized his observations in "Diseases of Soybeans in southwestern Ontario in 1954".

The disease situation in soybeans in s. w. Ont. in 1954 was characterized by (a) a decline in the severity and incidence of stem canker, (b) the appearance of an apparently important new disease, (c) an accentuation of physiologic disorders, and (d) the effects of a protracted mid-season drought, July being the driest month on record for most of the area.

STEM CANKER (Diaporthe phaseolorum (Cke. & Ell.) Sacc. var. caulivora (Athow & Caldwell, Phytopath. 44:328. 1954). As early as 4 Aug. dead or dying spurs and petioles were noted on the lower stem of Blackhawk plants. By 24 Aug. Lincoln plants similarly affected were common. From plants of both varieties isolates of the pathogen were readily obtained. Despite an inoculum potential similar to that of previous years, the disease this season was much less destructive than usual. In other years plants have been attacked and killed by mid-August, and often as the season advanced the disease increased in intensity, seriously lowering the quality and yield of seed. This year no plants were found dead before 1 Sept. On 15-16 Sept., when a survey of commercial fields in Essex Co. was carried out, stem canker was found affecting not over 8% of the plants. It was noted also that, in general, loss of yield was slight because infection had occurred too late or had progressed too slowly to affect seriously seed production. Another factor in the lower incidence of stem canker was the very much reduced acreage of the two highly susceptible varieties Blackhawk and Hawkeye.

Towards mid-September in three different years counts were taken of the incidence of stem canker in 5 commonly-grown varieties. The results are briefly summarized below.

	Percentage Incidence of Stem Canker		
Variety	1951	1952	1954
Harman	3.5	8.7	Trace
Harosoy	4.5	5.7	Trace
Lincoln	9.9	18.5	8.0
Hawkeye	15.2	26.1	
Blackhawk	24.3	54.7	

From these data Harman and Harosoy appear highly resistant, Blackhawk highly susceptible, and Lincoln mod. susceptible to stem canker. However, the resistance of Harman and Harosoy is more

apparent than real, because when 150 plants of each of these two varieties and of Blackhawk in adjacent rows in the laboratory plots were inoculated on 11 Aug. by the toothpick method with a highly pathogenic isolate of D. phaseolorum var. caulivora, every plant of all three varieties was killed. No explanation can be offered for the escape of Harman and Harosoy under conditions of natural infection.

SUSPECTED NEW DISEASE (cause unknown). On July 12, attention was called to a field of Lincoln soybeans in which the rows were becoming appreciably thinner on account of wilting and dying of the plants. Investigation disclosed that the collapse and death of plants had been occurring since they first emerged as seedlings. Most of the affected plants showed a more or less extensive lesion on the stem at ground level; the roots were not affected. On 15 July diseased specimens showing identical symptoms were received from the Woodslee area in Essex county. The Woodslee material was the first of a series of diseased soybean specimens that finally constituted the largest number to be received at the laboratory in a single season. Specimens were received from points as far n. as Petrolia in Lambton Co., and as far w. as St. Thomas in Elgin Co.

All specimens were alike in having lesions on the lower stem. The lesions varied in size and appearance. When sometimes the epidermis was dried and depressed, the lesions resembled those of fire blight on young apple and pear twigs. Others were gray or distinctly brown in colour. Internally there was a correspondingly wide variation in symptoms, which ranged from a faint grey or brown streaking in the woody tissues to disintegration and marked discoloration of the tissues as seen in stems affected with brown stem rot.

Many of the fields from which specimens had been received were visited. In some instances the disease was more prevalent in the lower parts of the field; in others, although many plants were dead or dying in the rows, no pattern was apparent. The disease is unique in that killed plants continue to collapse and die throughout the season. No estimate of losses was made, but they must have been appreciable. In a 26-acre field of Harosoy where a careful count was made over 20% of the stand was affected. All of the commonly-grown varieties seemed equally susceptible.

Isolations were made from a considerable number of specimens. Among the organisms obtained, species of Botrytis and Fusarium and an unidentified phycomycete predominated. Their pathogenicity remains to be investigated.

GREY MOULD (Botrytis cinerea). On 10 Aug. a gray mould was observed on the stems of a considerable number of plants growing in the laboratory plots. The mould enveloped the stems for about 2 inches above the ground level. Its presence could have been easily overlooked. Infected Lincoln and Blackhawk plants continued to be found, although less frequently until the end of August. Infected plants appeared to be

little injured. Only two references on the occurrence of Botrytis on soybeans were found in the literature. H. Pape (Gartenflora, 70(3-4): 48-50. 1921) reported in Germany a species of Botrytis that evidently first attacked young pods and later infected the main axis of the stem. Lobik (V. I. Bull. North Caucasian Plant Prot. Sta., Rostoff-on-Don, 1930, 6-7, p. 285) reported Botrytis attacking a variety of soybeans in the North Caucasus. Whether the Botrytis on the plants in the laboratory plots is related in any way to the new disease reported in the previous section is not known.

BUD BLIGHT (virus). In the course of selecting for inoculation soybean plants in the laboratory plots at Harrow it was found that the roots of some of the plants pulled up for discard were infested by mealybugs, which were subsequently identified at Ottawa to be the grape mealybug Pseudococcus maritimus (Ehrh.). It also appeared that the mealybugs had only recently spread from the roots of red clover in adjacent plots. Further observations provided circumstantial evidence that bud blight infection was in some manner correlated with the mealybug infestation 1/

PHYSIOLOGICAL DISEASES

(a) Manganese Deficiency as usual was prevalent over large areas in Kent and Essex counties. Damage was sl.-sev.; in some fields returns from the crop would not suffice to meet costs of production. On account of its economic importance a considerable acreage is sprayed each year with manganese sulphate. The chemical is applied at widely different concentrations and with a variety of equipment. 2/

1/ For a fuller account of the occurrence of Mealybugs and of Grey Mould on soybeans in Ontario see A. A. Hildebrand and N. R. Boyce (Plant Dis. Reptr. 39(2): 171-173. 1955).

2/ Growers are advised to spray their crop with manganese sulphate as soon as the symptoms appear. When the deficiency is first evident the leaf blades turn a light green except the veins, which remain a dark green. Later the leaf tissue turns a golden yellow while the veins still remain green. The disease occurs mostly in clay soils and sometimes on muck; it is worse in some years than others. A popular proprietary material is Tecmangan, which contains 70% manganese sulphate as well as ammonium and magnesium sulphate. According to Dr. Hildebrand he recommends a minimum of 6 lb. of the material per acre. The amount of water may be varied (20-50 gal. per acre), depending on its availability. In the Soya-Bean Newsletter Vol. 2, No. 7, July 8, 1954, 3-4 lb. of manganese sulphate and 2 cups of liquid Orthex are recommended for each 40 gal. of water. Apply 8-10 lb. of the sulphate per acre, at a spray pressure of 125 lb. Dr. Hildebrand has recommended that farmers leave an unsprayed strip in their fields in order to observe the benefit. With most growers an application of manganese sulphate has become a standard cultural practice. Spraying of course only protects the current crop. (I. L. C.).

(b) Potassium Deficiency was observed in several fields, more especially in those in which heavy crops of corn had been produced last year, and to which no fertilizer was added before soybeans were planted this year.

Several other diseases were noted now and then throughout the season, but they caused only slight damage and warrant only brief mention. Brown Stem Rot (Cephalosporium gregatum) attracted attention this year only late in the season. On 16 Sept. almost all the plants in a field of the variety Adams were found to be infected. Adams on the average matures one day earlier than Lincoln. The effect of the disease was to cause Adams to appear to have matured much in advance of Lincoln. A similar instance was reported in 1950 (P. D. S. 30:41). Phyllosticta Leaf Spot (Phyllosticta sojaecola) produced the typical tatter-leaf symptoms for a short time early in the season, and threatened to become serious in a large field of Lincoln. On 25 June the foliage of almost every plant in this field was infected. The infection did not spread however, and in a short time new growth had hidden the diseased leaves.

Other Observations

BACTERIAL BLIGHT (Pseudomonas glycinea) or possibly Bacterial Pustule (Xanthomonas phaseoli var. sojensis) was rather prevalent in the University plots at Winnipeg, Man. late in the season. No laboratory check was made on the material (W. E. Sackston).

SUNFLOWER

Dr. W. E. Sackston has again contributed a special report on "Sunflower Diseases in Manitoba in 1953".

Sunflowers were sown on about 20,000 acres in Man. in 1954, compared with 5,000 acres in 1953. Weather conditions were unfavorable in 1954 and diseases were more destructive than in the last two seasons. The estimated average yield per acre was down to 650 pounds of seed. Fifty fields were examined for disease, seven of them 27 July and the rest during a survey covering most of the sunflower area, 7-10 Sept. Most of the fields examined were 2-3 weeks from maturity at the time of the survey. Dr. E. D. Putt, Experimental Station, Morden, and Mr. L. E. Siemens, Coop. Vegetable Oils, Altona, assisted in the survey.

RUST (Puccinia helianthi), was not found in the 5 fields examined 27 July. In September rust was a trace in 11 fields, 1-5% in 24, 10-15% in 5, 20-25% in 4, and 40% in 1. The rust percentages were based on the infections on the mid-leaves of the plants. Lower leaves carried more rust, and the upper leaves less. Infections were read on the Advance hybrid, and on the Sunrise and Mennonite varieties. In crossing blocks and mixing fields, where S37-388, the female parent of Advance,

occurred, it was rusted more heavily than Sunrise, and inbred plants in Advance fields also showed much more rust than the hybrid. Infections on S37-388 were 30-60% in fields where Sunrise or Advance showed only 5-10% rust. Plantings of the Synthetic M-1 variety, grown in two-acre plots in farm fields of Advance, showed only traces to 5% rust, even where Advance was fairly heavily rusted. Rust was present on sunflowers in plots at Melita, but not at Indian Head, Sask.

Pycnial infections of rust were found on volunteer sunflower seedlings in the Morden area in mid-June and near Winkler in July, but were not noticed elsewhere. Rust infections developed well in inoculated plots at Winnipeg and at Morden. In one farm field in which there were only traces of rust 27 July, the mid-leaves averaged 25% rust 8 Sept.

WILT (Sclerotinia sclerotiorum). Twenty fields were apparently free of wilt. Traces of the disease were found in 26 fields, and 1%, 5%, 10%, and 40% of wilt, in 1 field each. The 40% infection occurred in the same field or in an adjacent one which had 20% wilt in 1950.

Several mid-stem infections, apparently initiated by air borne ascospores, were observed in farm fields and experimental plots. Head and neck rot caused by Sclerotinia was seen on three or four plants.

DOWNY MILDEW (Plasmopara halstedii) infections were more prevalent and sev. in the main sunflower area than in any previous year. Traces were found in only one "outlying" field. Traces of the disease were found in 8 fields, 1-5% in 2, 6-10% in 3, 15-20% in 2, 30% in 1, and 95% in 1 (of 20 acres extent, which was plowed down). All infections were systemic; no secondary leaf infections were seen. About 5% of the plants were stunted by mildew infection in a "permanent" sunflower plot at Winnipeg, where the disease was observed for the first time in 1953 (on about 1% of the plants). Mildew was conspicuous in one replicate of a nursery in the University plots at Winnipeg, but was difficult to find in the rest of the nursery, located on higher, drier ground. The increase in mildew infection seems to be associated with the high moisture of the last two years.

Differences in varietal reaction to downy mildew have been observed previously; S37-388 appeared more susceptible than Sunrise, in crossing blocks. The Synthetic M-1 variety appeared much less susceptible than Advance hybrid growing beside it in farm fields in 1954.

Symptoms strikingly similar to those induced by herbicides, such as 2,4-D, were observed on a number of plants stunted by systemic infections of downy mildew. Distortion and rugosity of the leaves of mildewed plants has been observed frequently, but the "2,4-D" pattern of venation and distortion had not been noticed before. The other symptoms characteristic of systemic downy mildew infections made confusion of the two conditions quite unlikely.

LEAF MOTTLE (cause unknown). The leaf mottle condition first observed in 1948 (P. D. S. 28:32) was prevalent and sev. in the central

sunflower area. Traces were found in only 3 fields outside the main area. Mottling was a trace in 8 fields, 1-5% in 3, 25-35% in 3, 50% in 1, and 65% in 1. According to Mr. L. E. Siemens, yields from some of the fields with high percentages of mottle were only 200-300 lbs. per acre, contrasted with 500-600 lbs. per acre from nearby fields, or relatively unaffected portions of the same fields. Vascular discoloration was noted in all the mottle plants which were examined. Stalk Rot and Black Jelly-Rot (P.D.S. 29:35, P.D.S. 31:38) were present in trace amounts in four fields in which leaf mottle was severe. No stalk rot was found in the field with 65% mottle. In this same field, or one adjacent to it, there was 5% mottle in 1949 in mid-August, and 5 to 10% stalk rot in mid-September.

FLORAL DEFORMITY (?aster yellows virus), first described in 1953 (P.D.S. 33:47), was widely prevalent on sunflowers in Man. Traces of the deformity were found in 22 fields, 1% in 3, 3% in 1, and 5% in 1. It was present in plots at Melita, Manitoba, but not at Indian Head, Sask., although symptoms attributed to aster yellows virus were conspicuous in flax plots near the sunflowers. The condition was just as noticeable in outlying fields as in the main sunflower area. The Synthetic M-1 variety seemed to be more subject to this disorder than Sunrise, which was more susceptible than the Advance hybrid. It was not recognized on the S37-388 inbred.

MISCELLANEOUS. Traces of damage from drift of 2,4-D herbicide, applied variously by ground rigs and by aircraft, were seen in 8 fields. Severe damage was observed in 3 fields. A wilting, cause unknown, of three to four leaves, below the apical whorl subtending the sunflower head, was observed in a number of plots and in some farm fields. Black Stem, observed in 1953 at Altona, in a plot sown to sunflowers repeatedly, (P.D.S. 33:47), was not seen there in 1954. Head Drop was present in trace amounts in 13 fields, and in experimental plots. Black flecks on sunflower stems, identical in appearance with the early symptoms attributed to virus infection in Argentina, were found in 7 farm fields, 4 of the Mennonite variety, 2 of Synthetic M-1, and 1 of Advance. Similar flecking in experimental plots at Winnipeg was more conspicuous on the Synthetic M-1 and M-3 varieties, than on Sunrise and Advance. Hail damage was severe in a number of fields, and in plots at Winnipeg. Common dodder was observed on sunflowers for the first time, in an isolated field surrounded by bush.

Other Observations

The new rust resistant variety, Synthetic M-1 mentioned above yielded well in tests at Morden, Man. in 1954. On land where the plants were artificially inoculated with sunflower rust average yields per acre of sunflower seed was Synthetic M-1, 1946 lb., Synthetic M-3, 1375 lb., Advance 472 lb., and Suprise 610 lb. On land where the plants were not

inoculated, the corresponding yields were 1951 lb., 1574 lb., 1024 lb., and 907 lb. respectively. These results indicate that Synthetic M-1 is highly resistant to rust, a fact of considerable importance to the sunflower oil industry in Man. (T. M. Stevenson).

C. ROOT CROPS

MANGEL

LEAF SPOT (Cercospora beticola) infection was mod.-sev. in the plots at the Station, Charlottetown, P. E. I. (J. E. Campbell).

SUGAR BEET

LEAF SPOT (Phoma betae). Tr. infections were observed in 2 fields near Taber (F. R. H.).

BLACK ROOT (various fungi). All 44 fields examined after emergence in s. Alta. showed damage by black root. An average of 53% of the seedlings were infected and 3% were sev. damaged or killed. Phoma betae was found in 59% of the fields, Rhizoctonia solani in 49%, Pythium spp. in 39% and Aphanomyces cochlioides in 17%. No damage was observed in the fields later in the season or in storage piles in October (F. R. Harper).

D. MISCELLANEOUS CROPS

CORN

RUST (Puccinia sorghi). A tr. was found on all hybrids in Essex and Kent counties, Ont. (N. J. Whitney) and about Charlottetown, P. E. I. (R. R. Hurst).

STALK ROT (Pythium and Fusarium spp.) caused considerable damage to corn inbreds at the Station, Harrow, Ont. In s. w. Ont., stalk root was found in most fields of hybrid field corn. Damage ranged from sl. to sev. (N. J. W.).

ROOT ROT (Pythium and Fusarium spp.) often caused sev. damage to hybrids and inbreds of field corn in Essex, Kent and Lambton counties, Ont. (N. J. W.).

SMUT (Ustilago maydis) was found frequently on hybrid corn in s. w. Ont.; infection ranged up to 50% and averaged about 5% (N. J. W.). A single affected ear was noted in field corn at Charlottetown, P. E. I. (R. R. Hurst).

MUSTARD

WHITE RUST (Cystopus candidus) sev. infected a few plants in fields at Milk River and Vauxhall, Alta. (M. W. Cormack). A sev. infection occurred on black mustard in the Botanical Garden, Montreal, Que. (P. Duval).

SUDAN GRASS

LEAF SPOT (Colletotrichum graminicola) was found in the laboratory plots at Edmonton, Alta. (W. P. C.).

CULTIVATED AND OTHER GRASSES

AGROPYRON-Wheat Grass

Ergot (Claviceps purpurea). Collections were made in Alta. as follows:
one on A. cristatum near Drumheller, 7 on A. dasystachyum, 27 on A. repens, 16 on A. smithii, 22 on A. subsecundum, and 3 on A. trachycaulum n. e. of Edmonton (W. P. Campbell). Ergot infection on A. repens was tr. - mod. in roadside stands near St. Catharines, Ont. (T. R. Davidson) and was heavy at La Have, Lunenburg Co., N. S. (D. W. Creelman). A sl. infection was seen on couch grass in the cereal plots at Monticello, P. E. I. (J. E. Campbell).

Powdery Mildew (Erysiphe graminis) was heavy on A. repens at Riverport, Lunenburg Co., N. S. (D. W. C.).

Head Smut (Ustilago bullata) infected 10% of the heads of A. trachycaulum in the plots at Lethbridge, Alta. (M. W. Cormack).

Stem Smut (Ustilago hypodytes). A tr. infection was found in one stand of A. repens at St. Catharines, Ont. (T. R. Davidson).

AGROSTIS

Ergot (Claviceps purpurea). A collection of ergot was made on A. alba near Barrhead, Alta., and another on A. exarata near Fort St. John, B. C. (W. P. Campbell).

Leaf Rust (Puccinia rubigo-vera) was heavy on A. tenius at Broad Cove, Lunenburg, Co., N. S. (D. W. Creelman) and light on A. stolonifera in a fallow field at Gaspe, Que. (D. Leblond).

ALOPECURUS

Leaf Spot (Mastigosporium album) was again sev. on A. pratensis in the same field at Wolfville (not Kentville as reported in P. D. S. 33:50), where it was first found in 1953. It has not been found elsewhere in the province (D. W. Creelman). It may be noted that M. album was reported on meadow foxtail growing near Ithaca, N. Y., in June 1954. (Plant Dis. Reptr. 38:607-608. 1954) (I. L. C.).

ARRHENATHERUM

Ergot (Claviceps purpurea). A collection was made on A. elatius near Fort St. John, B.C. (W. P. Campbell).

BROMUS - Brome Grass

Ergot (Claviceps purpurea): 56 collections were made on B. inermis in Alta.; 2 were also made on B. ciliatus near Fort St. John, B.C. (W. P. C.).

Leaf Rust (Puccinia rubigo-vera). A mod. infection was observed on some plants of B. tectorum at St. Catharines, Ont. (T. R. Davidson).

CALAMAGROSTIS

Ergot (Claviceps purpurea): 22 collections made on C. canadensis in Alta. (W. P. Campbell).

Crown Rust (Puccinia coronata) was generally present in Lunenburg Co., N.S., but infection was sl. (D. W. Creelman).

DACTYLIS GLOMERATA - Orchard Grass

Ergot (Claviceps purpurea). A mod. infection was noted in 3 stands at St. Catharines, Ont. (T. R. Davidson).

Downy Mildew (Sclerophthora sp.) was found sporulating on leaves in rod rows of the grass at Saanichton in February. The fungus was also fruiting on the grass in a 12-acre field at Sumas in November. The grower claimed that yield of grass grown for ensilage was materially reduced. The fungus appears to be undescribed. (W. Jones).

Brown Stripe (Scolecotrichum graminis) mod.-sev. infected a few plants in the nursery at Lethbridge, Alta. (M. W. Cormack). It caused mod. damage to the leaves of orchard grass at Kentville, N.S.; it appears to be quite common on this grass each fall (D. W. Creelman).

Rust (Uromyces dactylidis). Uredinia and telia abundant in test rows at Saanichton, B.C. (W. Jones).

ELYMUS

Ergot (Claviceps purpurea): 24 collections were made on E. inovatus in the Peace River area, Alta., and one near Edmonton (W. P. Campbell).

Powdery Mildew (Erysiphe graminis). A mod. infection was noted at Fort Vermilion, Alta., on E. junceus (J. B. Lebeau).

FESTUCA - Fescue

Ergot (Claviceps purpurea). A single collection was made on F. rubra at Fort St. John, B.C. (W. P. Campbell).

Common Root Rot (Helminthosporium sativum and Fusarium spp.) caused sl. damage to creeping red fescue at Olds, Alta. (J. B. Lebeau).

GLYCERIA

Ergot (Claviceps purpurea) was collected on G. borealis n.w. of Lloydminster, Alta. (W. P. C.).

PHLEUM PRATENSE - Timothy

Ergot (Claviceps purpurea): 14 collections were made on timothy in Alta. (W. P. C.). A tr. infection was noted in a planting at St. Catharines, Ont. (T. R. Davidson).

Anthracnose (Colletrotrichum graminicola) caused 25-50% infection in a low field at St. Tite, Laviolette Co., Que. (D. Leblond).

Stem Rust (Puccinia graminis var. phlei-pratensis) caused mod. damage in a stand at Petite Riviere, Lunenburg Co., N.S. (D. W. Creelman).

Eye Spot (Selenophoma donacis) was found on a few plants at St. Clement, Riviere du Loup Co., Que. (D. L.).

POA

Ergot (Claviceps purpurea) was collected once on P. pratensis near Edmonton, Alta. (W. P. C.).

Powdery Mildew (Erysiphe graminis). A sl. infection was observed on Marion blue grass near Beaverlodge, Alta. (J. B. L.). The disease was mod.-sev. everywhere on P. pratensis in Que. (D. Leblond).

Leaf Rust (Puccinia poae-nemoralis) caused a sl. infection on Merion blue grass (P. pratensis) near Beaverlodge, Alta. (J. B. L.; I. L. C.).

SETARIA GLAUCA

Smut (Ustilago neglecta). A tr. infection near Fonthill, Ont. (T. R. Davidson). Many Ont. records (D. B. O. Savile).

SPARTINA

Rust (Puccinia sparganioides) was heavy on both S. pectinata and S. patens in the coastal areas of Lunenburg Co., N.S. (D. W. Creelman)

STIPA VIRIDULA

Ergot (Claviceps purpurea). One collection made n. w. of Lloydminster, Alta. (W. P. Campbell).

TURF

Brown Patch (Rhizoctonia solani). Several patches were present on a green of a golf course at Charlottetown, P. E. I. (J. E. Campbell).

Blackening (Symploca muscorum (Ag.)Gom.). From a city lawn in Vancouver, B. C., showing severe blackening a small patch of turf was sent by I. C. MacSwan. The black threads or growths on the grass proved to be colonies of a blue-green alga. The alga was identified as Symploca muscorum by Elwyn O. Hughes, National Research Council, Ottawa. The usual habit is given as "amongst mosses, on moist earth, or in greenhouses". It would appear that the lawn had suffered from excessive moisture (I. L. Conners).