I. DISEASES OF CEREAL CROPS

WHEAT

STEM RUST (*Puccinia graminis*) was general on Reward, Red Bobs, and Marquis wheat in the Creston area, B.C., on newly reclaimed land at the southern end of Kootenay Lake. No rust was found on Thatcher.

Stem rust was first observed at Lacombe, Alta., on Aug. 3, but undoubtedly it was present earlier in the eastern sections of the province. Infection was moderate to severe on late stands of Marquis in eastern Alberta, including the Vegreville, Camrose, Stettler, and Lethbridge districts. Only a few scattered fields were seriously damaged since about 95% of the fields were sufficiently advanced to escape infection. Rust decreased progressively westward, infection averaging 10-20% in late fields between Edmonton and Cardston. Traces of rust were found west of Edmonton at Wildwood and Edson, where it has not been previously reported.

Stem rust made its appearance at Indian Head, Sask., on June 21 and at Saskatoon on July 7, almost two weeks earlier than normal. It spread throughout the whole of the agricultural area of Saskatchewan and was everywhere severe on late susceptible wheat varieties except where crops were prematurely ripened by dry weather. In general, however, heavy stem rust infection was confined largely to the eastern part of the province, where rainfall was more abundant, the westerly boundary being a line drawn through Assinboia, Moose Jaw and Melfort. Infection ranged as high as 90% in some late fields of susceptible varieties in the heavy rust area. West of the line described above, infection was mostly light and quite variable. Light early stands in that area showed only traces of rust, while some of the later heavier stands carried upwards of 20% infection. Thatcher, Apex, and Renown were all practically free from stem rust.

This year, stem rust of wheat made its appearance in Manitoba a week earlier than normal. On June 22, a trace of stem rust was found on both wheat and barley at Brandon and Winnipeg and the following day rust was observed on susceptible wheat varieties at Morden. Frequent heavy spore showers over Manitoba during late June and early July, and sufficient moisture, in the form of dew, for spore germination favoured the establishment and rapid spread of rust. By the end of the first week in July stem rust was general on susceptible wheat varieties throughout the province and in late July and early August when infections had reached their maximum the severity of infection on these varieties ranged from 70-100% on all stems. The susceptible wheat varieties were materially reduced in both yield and grade by rust. In some

cases late crops of Marquis, Ceres, and Reward were so badly damaged by rust that the fields were left unharvested. Fortunately, however, only about 14% of the wheat acreage of Manitoba was sown to susceptible varieties. Only slight traces of stem rust occurred on Thatcher and Renown. In some fields of these varieties occasional pustules occurred on a small percentage of the plants.

Durum wheat in general escaped rust injury. Mindum, the durum variety generally grown in Manitoba, bore stem rust infections ranging from 5-10% in severity of infection. However, a few fields of durum, tentatively identified as a strain of Kubanka, were heavily rusted and severely damaged. In these heavily rusted durum fields the severity of infection averaged over 60%.

Temperature conditions were quite favourable for rust development during most of the growing season, particularly so during July. During that month temperatures exceeded the normal by 4 or 5° F. throughout most of the agricultural area of Manitoba. Precipitation was not particularly favourable for rust development. Rainfall, except in the northern parts of the province and in some local areas in the extreme eastern and south-central districts, was 40 and 30% below normal for June and July respectively. Dew formation, however, was frequent and heavy and favoured the initiation of rust infection. (B. Peturson)

Stem rust usually varied from 10-30% on wheat in Oxford county, Ont., and apparently caused slight damage. In one field 80% of rust was present. Conditions were similar in Lanark county. (G.A. Scott)

Stem rust infection ranged from 40-100% on susceptible wheat varieties at Ste. Anne de la Pocatiere, Que., while not more than traces occurred on the rust resistant varieties, Coronation, R.L. 1005, R.L. 716.6, and Thatcher. Similar observations were made at Cap Rouge and Lennoxville.

Aecia were plentiful on a barberry hedge at Shediac, N.B. on June 10, where rust was severe on oats in August (J.L. Howitt & S.F. Clarkson). Stem rust was first observed at Fredericton, N.B. on July 16, and it began to be prevalent about Aug. 1 in the Maritime Provinces. Infection ranged from 30-100% in mid August on susceptible varieties and was causing moderate to severe damage in most fields. While the rust resistant varieties are only beginning to be grown, a group of them were examined at 14 widely

scattered Stations and were found to be free or to bear only traces of rust. Three fields of durum wheat in N.B. were lightly rusted. (I.L. Conners)

LEAF RUST (Puccinia triticina) was general on Reward, Red Bobs, Marquis, and Thatcher at Creston, B.C.

Leaf rust was general throughout Alberta, but in most fields the infection was not heavy. Its prevalence in 1938 is in marked contrast with 1937, when less leaf rust was present than usual.

Leaf rust was common throughout Saskatchewan in 1938. It was prevalent in the eastern part of the province, especially along the eastern border. Thatcher was very susceptible.

Leaf rust of wheat was first observed in Manitoba this year on June 20. From then on it increased very rapidly and by the end of July this rust had become epidemic throughout most of the agricultural area of Manitoba. The heaviest infections occurred in the regions of heavier rainfall, namely the eastern and northern areas of the province. Infections were lightest in the southwestern districts where rainfall was in general quite scanty. Of all the commercial wheat varieties, Thatcher, a new stem rust-resistant variety, was the most severely affected by leaf rust. Infections generally averaged upwards of 60% on this variety except in localities where rainfall was deficient. Renown, another new rust-resistant variety, was also attacked by leaf rust, but to a much less extent than Thatcher. Infections on Renown averaged about 30%. The old standard varieties, Marquis, Reward, and Ceres, bore infections averaging about 45%. The yields of all the varieties were materially reduced by this rust. Controlled experiments conducted at the Dominion Laboratory of Plant Pathology, Winnipeg, demonstrated that yields and grades of both Thatcher and Renown were reduced by leaf rust and in the case of Thatcher the reduction in yield was quite pronounced. Conservative estimates indicate that leaf rust, in some localities, reduced the yield of early-sown Thatcher by about 25% and in late sown fields the reduction in yield probably amounted to 35% or more. Only slight traces of leaf rust occurred on durum wheat varieties. (B. Peturson)

Leaf rust was prevalent in Que., N.B., N.S., and P.E.I. on Huron and other varieties commonly grown in these provinces. Several of the stem rust resistant varieties, however, were free of leaf rust or showed low percentages.

STRIPE RUST (Puccinia glumarum) was general in and was causing some damage to three fields of winter wheat at Sumas, B.C., on May 24. It was general on Bromus sitchensis at Hatzic and on Elymus glaucus at Dewdney (W. Jones). A slight infection was found on a wheat introduction at Castor, Alta., on Aug. 3 (K.W. Neatby). Stripe rust slightly to moderately infected Hordeum jubatum in southern Alberta in late August and it was collected on the same host at Edmonton, Vermillion, Wainwright, and elsewhere in early September.

BUNT (Tilletia caries and T. laevis). A summary of the bunt situation in Western Canada was prepared from the records of the Western Grain Inspection Division and kindly supplied by Dr. W.F. Hanna and W. Popp.

While 333 cars of wheat were graded smutty in the first quarter of the 1938-39 crop year, it represents only 0.3% of all the cars graded. In fact the percentage of cars graded smutty in the past seven years has been less than 1%. It should be noted that while bunt has been kept well under control in spring wheat, bunt is destructive in winter wheat in Alberta. This year 69 cars (22.3%) of Alberta Red Winter graded smutty out of 309 cars inspected and for a period of years the percentage of smutty cars has been from 10 to 25%.

Table 1. Wheat Bunt in Western Canada

Summary of Inspections from August 1 to October 31, 1938.

Class of Wheat	Cars Inspected	Cars Graded Smutty	Percentage Smutty
Hard Red Spring	86,687	221	0.2
Amber Durum	7,154	34	0.5
White Spring	7	0	0.0
Alberta Red Winter	309	69	22.3
All classes inspected	100,894	333	0.3

Losses from bunt were heavy in winter wheat at Armstrong, B.C., this season, about 15% of the heads being bunted. Bunt caused slight damage in three fields in southern Sask.; however 20% of the heads were affected in a field at Maple Creek. A trace was found at Collette Village, N.B. and in Huron wheat in Queens county, P.E.I.

LOOSE SMUT (Ustilago Tritici). In Alta. a trace of loose smut was found in 2 out of 80 fields examined. In Sask. loose smut was present in 33 out of 218 fields, average damage being a trace or a trace + . According to Prof. T.C. Vanterpool, many more enquiries were received from farmers than usual. Loose smut was very common this year on Reward wheat in Man. It was present in 7 out of 8 fields; average infection 7.5%; high infections were 25% at Oakville and 15% in certified Reward at Fort Garry. Loose smut affected 12 out of 13 fields of Ceres; average infection 2%; range, trace to 5%. No loose smut was recorded in Thatcher, Renown, Marquis, Garnet or durum wheat.

Loose smut infection varied from 1.1 to 1.8% in four fields of winter wheat, the seed of which was treated in 1936 in Kent county, Ont. In several fields, the seed of which was treated in 1937, no smut was present, while other fields of the same seed untreated, showed 5-10% of smut. (N.D. MacKenzie)

Loose smut was present in 39 out of 73 fields in N.B., N.S., and P.E.I. Usually only a trace was present, but in six infection ranged from 1-3% and in one field of Huron wheat at Gueguen, N.B., it was 6% (I.L. Conners). A trace was present in Huron at Lennoxville, Que.

BLACK CHAFF (Phytomonas translucens var. undulosa) slightly infected one field at Edmonton, Alta., and a trace was found in Apex and Renown at the Lacombe Station. A slight infection was observed at Winnipeg and Swan River, Man.

BASAL GLUME ROT (Phytomonas atrofaciens). A trace was found in 3 fields out of 80 examined and infection was a trace to moderate in the variety plots at Olds, Alta. A slight infection was recorded in a field at Winnipeg.

ERGOT (Claviceps purpurea). Traces of ergot were found at Okatoks, Alta., and at Charlottetown, Brackley and Stanhope, P.E.I. Seed from Thatcher grown in 1937 at Kipling, Sask. was not certified, due to excess ergot. The grower remarks: "In the past we have been growing large acreages of western rye grass and in the seed certificates the note, "trace of ergot" has been often present. Now ergot is showing to some extent in crested wheat grass (var. Fairway) we are growing and this month we had Thatcher wheat turned down as certified because of excess ergot." A trace of ergot was found in 5 fields near Lindsay, Ont.

GLUME BLOTCH (Septoria nodorum). A trace to slight infection was reported in 8 fields out of 80 examined in Alta. The disease was present in 50 out of 58 fields in the Maritime provinces as follows: traces in 28; slight in 14; moderate in 13, and severe in 1. Some of the new rust resistant strains, notably C-26-44.7, appeared to be more susceptible to glume blotch than others. Further observations are important, for the disease may become destructive with the control of the rusts in the East. (I.L. Conners)

SPECKLED LEAF BLOTCH (Septoria Tritici). A trace or a slight infection was recorded in 4 fields in Alta., and infection ranged from a trace to severe in the plots at Lacombe.

FOOT ROTS. Take All (Ophiobolus graminis) was found in 13 out of 80 fields visited in Alta.; most of the affected fields were in the Camrose and Vegreville districts. Infection was slight to moderate except in 3 fields, where the damage was estimated to be 10-15%. Common Root Rot (Helminthosporium sativum and Fusarium spp.) was present in 44 of the 80 fields examined. Infection was as follows: trace in 24 fields; slight in 7; moderate in 8 and severe in 5. The latter were located at Brooks, Pincher Creek, Innisfree, Lavoy, and Vegreville.

A trace of Take All was present in 8 second-crop fields in the Quill Lake and Naicam districts, Sask. Affected plants were also received from Invermere. Common Root Rot was found in 210 out of 218 fields examined; the average damage was moderate. A special study is under way of samples from 25 Experimental and Illustration Stations representing many types of rotation. Anthracnose (Colletotrichum sp.) was present on sickly plants in a diseased patch near Melfort. Wojnowicia graminis was found on stubble collected at Quill Lake and placed in moist soil outside until Oct. 26. A trace of Prematurity Blight (cause not fully known) was found in 3 fields. At Aberdeen about 1% of the plants were blighted in a small field surrounding some experimental plots. The plants bore at the base of the culm, numerous sporodochia which contained macroconidia of Fusarium.

A trace of Take All was found in a few fields between Garson and Beausejour, Man. Common Root Rot was again prevalent. The damage was severe over the south-western part of Manitoba, but it was medium to light elsewhere. Drought during late summer tended to accentuate the damage and the disease was particularly noticeable in highly saline soils (J.E. Machacek).

Common Root Rot was general in most fields surveyed near Lindsay and Peterborough, but it was not severe in any. (G.A. Scott)

A Stem Rot (Fusarium spp.), particularly as a decay of the nodes, was quite common this year in Que. in early maturing varieties grown in wet fields. (C. Perrault)

Root Rot (Cryptoascus sp.). The fungus was quite abundant on the roots of wheat growing on a clay loam soil in a good state of fertility at Roseville, P.E.I. Affected plants have been found both on rich and poor soils. The disease was observed on barley at the Charlottetown Station and on barley and wheat at Cornwall. (G.W. Ayers)

BROWNING ROOT ROT (Pythium spp.). The area surveyed for browning root rot in Sask., was largely the central and northern portions of the wheat-growing area, with the exception of the extreme north-west. The greatest damage was in a wedge-shaped zone beginning in the neighbourhood of Saskatoon and widening towards the east, the worst fields being mainly west and south-west of the Quill lakes. This was approximately 80 to 110 miles south of the 1937 zone of greatest damage, that is, from Prince Albert to Tisdale. This latter area was one of the driest in the province this year, and showed only a trace of browning root rot. There were also some severely diseased fields in an area extending from south of Rosthern to south of Hague.

Some of the most severely diseased individual fields ever encountered were observed this year, the Pythium lesioning on the roots being characteristic, common, and severe. It gives the impression, supported already by some evidence, that over a period of years the fields are becoming depleted in fertility, and succumb to the disease when conditions are favourable to it. This helps to explain the shift in location of diseased areas from year to year.

The sudden onset of browning symptoms, which is well known, was strikingly revealed this year when two trips were made to the Colonsay-Elstow district, one on June 7 and another on June 13. On June 7 no sign of browning was evident and in the ordinary course of survey the district would have been recorded as free from browning for the current year. Some rain fell about June 9. On June 13 when the district was again visited, browning was fairly common and in some instances severe.

The delay in maturity of wheat caused by browning root rot was shown to render the crop more liable to damage from stem rust and frost by Vanterpool and Simmonds (Sci. Agr. 19:81-82. 1938).

Isolations made from diseased roots during June yielded Pythium tardicrescens and P. arrhenomanes in the ratio of about 4:1; this is the reverse of the usual ratio. It may be explained by the fact that the cool temperatures of May and early June were more favourable to P. tardicrescens, whose optimum growth rate has been shown to be lower than that of P. arrhenomanes (Vanterpool, Ann. Appl. Biol. 25:528-543. 1938). (T.C. Vanterpool)

In southern Sask. in an area traversed by the Canadian Pacific Railway between Moose Jaw and Indian Head, browning root rot infections ranged from slight to moderate. The heaviest infections were found between Regina and Moose Jaw, where crops on summer fallow were more common than elsewhere. (H.W. Mead)

Scattered but light damage from browning root rot occurred over many parts of southern Man. Damage was most severe west of Morris and about Plum Coulee. A moderate infection was observed at Dugald, on June 15 (J.E. Machacek). According to Mr. E.T. Howe, who assisted Prof. Vanterpool in his survey work for several years and is now Agricultural Representative at Selkirk, Man., browning root rot was widespread in wheat on fallow about Selkirk.

HEAD BLIGHT (Fusarium spp.). A slight infection was seen at Edmonton, Alta.; F. culmorum was fruiting freely on the material (A.W. Henry). A mere trace of scab was found at Winnipeg, Man.; F. culmorum was isolated (W.L. Gordon). Head blight could be detected in most fields visited in Oxford county, Ont.; the Helminthosporium-Fusarium types seemed to predominate, (G.A. Scott). Traces of head blight were recorded in 15 out of 53 fields in N.B., N.S., and P.E.I. Isolations were made by Dr. W.L. Gordon from 9 head-blight samples from these provinces. Fusarium graminearum was isolated from 4 samples (3 from N.S. and 1 from P.E.I.), F. Poae from 4, F. avenaceum from 1, while Epicoccum purpurascens was also present in one sample. It should be noted that Fusarium graminearum, the imperfect stage of Gibberella Zeae (Schw.) Petch (G. Saubinetii Auth.), is rarely isolated in Canada, however abundant it may be elsewhere (I.L. Conners)

GLUME DISCOLORATION (Alternaria, Cladosporium, etc. associated). Discolored glumes of Apex yielded Alternaria sp. in every case. The heads were collected at Saskatoon, Sask.

Dr. Hagborg confirmed the results (R.C. Russell). The disease was severe in the experimental plots at the University Farm, Fort Garry, Man. A slight infection was noted at Homewood, Man. (T. Johnson and W.A.F. Hagborg). Glume discoloration was severe on R.L. 1005 at Lennoxville. Alternaria sp. was isolated by Dr. Johnson from material sent him. (H.N. Racicot)

POWDERY MILDEW (Erysiphe graminis). A slight infection was present at Edmonton, Alta.; it caused moderate damage at Macdonald College, Que.

WHEAT NEMATODE (Heterodera punctata) caused slight damage in a field in the Rosthern district, Sask.

OAT NEMATODE (Heterodera schachtii). L.J. Chapman (Sci. Agric. 18:527-528. 1938) reports that in 1937 three fields of obviously unhealthy winter wheat were found in the infested area in south Simcoe county, Ont. One of the fields was plowed up later in the season as a crop failure, while the diseased portions (about 75%) of the other two were not worth cutting. It is not clear why these particular fields were heavily damaged, but they were sown unusually early, Aug. 28-Sept. 1, which would permit a maximum of infestation to take place in early autumn. The intervening winter was mild.

LEAF BLIGHT (Fusarium Poae). The leaves on the lower two-thirds of every plant were heavily infected in a field of Kubanka (durum wheat) at Macdonald, Man. The leaves were covered with Fusarium spores and isolations yielded F. Poae. This is the first severe infection of the leaves of wheat by a species of Fusarium ever noted in Manitoba. (W.L. Gordon)

KINK (Non-parasitic). A small amount of kink or buckling of the culm just above a lower node was observed in wheat near Melfort, Sask.

WHITE TIP (Non-parasitic). In a dates-of-seeding plot at Saskatoon, Sask., early sown Marquis wheat and Hannchen barley showed moderate to severe white tip of the heads on July 6. The rains came too late to prevent its development in the early plots, but it was absent from the later sown plots. White-tip samples were received from Reynaud, Environ, and Strasbourg about June 15. (T.C. Vanterpool)

FLOODING caused very severe losses in the Creston reclaimed area, B.C. in May onwards when approximately 80% of the area was flooded. (W.R. Foster)

SPIKELET STERILITY (cause unknown) was estimated to have caused a 30% loss in 2,000 acres of wheat in the Creston area, B.C. Practically all heads were affected, varying from one or two kernels missing to completely empty heads. All varieties were about equally affected. (W.R. Foster)

OATS

STEM RUST (Puccinia graminis) was general in the Matsqui district, B.C., causing 10% damage. A trace of stem rust was first found on oats at Vegreville, Alta., on Aug. 24. A slight to moderate infection was present in late stands by Sept. 17 at Edmonton, Wainwright, Vegreville, Vermilion, and other points, but no appreciable damage was caused.

Only slight traces of stem rust occurred on oats in the western half of Sask. In many of the fields no rust was found. It was more prevalent in the eastern sections, the heaviest infections observed being 50% near Yorkton and Melville.

Although stem rust was general on oats in Man., it appeared much later and was less prevalent than the other cereal rusts. In late fields in eastern and northern Man., upwards of 30% of rust was present. In earlier fields infection was markedly less. In the areas of sub-normal precipitation infection ranged from a trace to 10%. Vanguard proved highly resistant to stem rust. (B. Peturson)

Stem rust was prevalent in Northern Ontario, some fields having 80% of the plants affected (J.E. Howitt). Infection varied from a trace to 50% averaging 15%, in Oxford county, Ont.

Stem rust caused some damage at Macdonald College, Que. It was moderate to severe at Lennoxville on susceptible varieties, but only a trace was recorded on Vanguard.

In the Maritime provinces stem rust seldom exceeded a trace. At a few points badly rusted spots were seen, but the infection was very much less than last year. Barberries are definitely known to occur at some of these centres (I.L. Conners). Stem rust was heavy in some late fields in September in P.E.I. (R.R. Hurst)

CROWN RUST (Puccinia coronata) was prevalent on oats in eastern Sask., and was present in all grain growing sections of the province. A heavy infection of this rust was reported on late

oats near Lloydminster, Sask. It was not definitely observed in Alta.

Crown rust was quite prevalent throughout Manitoba. Like leaf rust of wheat it was most severe in the areas of abundant precipitation. In northern Man., the Red River valley, and in some localized areas in the central section the average infection ranged from 40-75% on standard oat varieties. However, in the southern and south-western parts of the province infection was much lighter. None of the commercial varieties of oats grown in Man. showed any resistance to this rust. Crown rust caused considerable damage this year. (B. Peturson)

Crown rust was, in general, light in Oxford county, Ont., except in one late field where 90% of rust was observed. It was also destructive in a field at Carleton Place (G.A. Scott). Crown rust was heavy but variable in Quebec. Aecia were also common on the buckthorn (I.H. Crowell).

Crown rust was prevalent throughout the western half of N.S., the southern half of N.B. and in P.E.I. In the Caraquet peninsula and along much of the north and east shore of N.B., only a trace was present, while the crop was filling rapidly. Eastern N.S. was not surveyed. The damage was much less than in 1937, because the crop was much further advanced before rust became prevalent. As in the previous year severe outbreaks were directly traceable to buckthorn plantings or escapes from them. From Meteghen Centre to Yarmouth, N.S., crown rust was epidemic, but primary infection was due to one or more spore showers from a distance. Excessive rain and fog provided ideal conditions for rust development (I.L. Conners). Aecia of crown rust were abundant on stems, leaves and berries of a Rhamnus cathartica hedge at the Fredericton Station on June 1. (S.F. Clarkson)

SMUT (Loose Smut, Ustilago Avenae and Covered Smut, U. Kolleri). The cat smuts were reported from 25 out of 71 fields examined in Alta.; infection varied from a trace to 15% and averaged 2%. Covered smut was present in 12 fields out of 42 inspected in Sask. with an average infection of about 1%; in one field at St. Gregor 50% of the panicles were smutted. Loose smut was present in 13 fields; average infection was a trace. The oat smuts were recorded in 6 out of 23 fields in Man.; average infection 3.2%; highest, 26%.

Loose smut was very prevalent throughout Northern Ontario; fields were observed where over 20% of the panicles were destroyed (J.E. Howitt). Oat smut was also heavy in North Simcoe county.

Near Peterborough, in 10 fields, infection was 10-15% in 2; 2-3% in 3, and a trace in 5.

Out of 207 fields examined in the Maritime provinces smut was recorded in 167 fields or 81%. The highest infections observed were mixed infections: 12% of covered smut and 23% loose smut at Brookfield, P.E.I., 22% covered and 4% loose at South Victoria, N.S., and 2% covered and 21% loose smut at Portage, P.E.I. Over half the fields contained at least one per cent of smut and 25% of the fields showed 5% or more of smut. Smut was evidently more prevalent this year than last, but it appeared to be less common than in 1936. (I.L. Conners)

Smut was severe in P.E.I. in 1938, infection ranging from traces to 50%. In order to assist farmers in controlling smut three gravity seed treaters were constructed and were loaned to interested farmers after the method of operation was demonstrated. These treaters were built to specifications supplied by Chemical Industries Ltd. The treater consists of a large oil drum with a top funnel, a screen cone and bottom funnel, designed to mix the grain and dust as the grain falls through the treater, and an opening at the bottom for the discharge of the grain. The organic mercury dust, Ceresan, was used exclusively. Upwards of 100 farmers used this device to treat their grain. Without exception smut was completely controlled; Early Alaska, Victory, and Laurel were the varieties most commonly treated. (R.R. Hurst)

HALO BLIGHT (Phytomonas coronafaciens) was found in 38 out of 71 fields examined in Alta.; infection was a trace in 11, slight in 23 and moderate in 4. A bacterial blight was prevalent on oats near Sudbury, Ont., 30-40% of the plants being affected, while 50% of the plants in one field in Welland county were affected.

STRIPE BLIGHT (Phytomonas striaefaciens) infection was a trace to slight in 3 fields in Alta.

FOOT ROTS. Common Root Rot (Helminthosporium and Fusarium spp.) was found in 25 out of 42 fields examined in Sask.; damage was moderate.

ANTHRACNOSE (Colletotrichum graminicola) was severe in a small patch in a plot at Melfort, Sask.; the plants were dead or stunted. Heterosporium sp. was also found fruiting on these plants.

LEAF BLOTCH (Helminthosporium Avenae) severely damaged a field at Moreland, Sask. In the Maritime provinces the disease was

present in 213 out of 216 fields as follows: trace in 28, slight in 99, moderate in 63 and severe in 33. (I.L. Conners)

HEAD BLIGHT was found in 26 fields out of 157 examined in N.B., N.S., and P.E.I. Usually the damage was a trace, but in 3 fields it was slight. It was far more noticeable in early varieties at several Illustration Stations. The worst outbreak was at Chegoggin, near Yarmouth, N.S., where one or more spikelets were affected in half or more of the panicles in varieties such as Alaska, Gopher, and Mabel. Dr. W.L. Gordon made isolations from 13 collections. The fungi isolated in order of prevalence were: Alternaria spp., 44 isolations; Botrytis sp. of the cinerea type, 13; Fusarium Poae, 12; Epicoccum purpurascens, 3; and F. avenaceum, 1. While Botrytis has been found on a wide variety of plants, previous reports of its occurrence on oats have not been seen. (I.L. Conners)

POWDERY MILDEW (Erysiphe graminis). A slight infection was observed in the greenhouse at Edmonton. (A.W. Henry)

BLAST (Non-parasitic) was recorded as follows in Alta.: trace in 31 fields; 5% in 19; 10% in 13, and 20% in one out of 71 fields examined. Blast was present in every field inspected in Sask.; damage was slight to moderate. Blast was ordinarily slight, but in one field at Innisville, Ont., it reduced the yield. In the Maritime provinces the average amount of blast was 15%, but in one field 50% of the spikelets were destroyed.

THRIPS INJURY. It was noticeable on the leaves and also the spikelets in the Maritime provinces; usually the injury was a trace, but a few fields were slightly affected. Oat heads from one field near Martintown, Ont., were severely affected by thrips.

GREY SPECK (Manganese deficiency) is quite patchy in the fields of the College farm, Macdonald College, Que. It was severe in one block of Banner.

NEMATODES (Heterodera schachtii). No large areas have been found infested by nematodes outside the counties of Waterloo and Simcoe. A field of oats in Oxford county and another in Gray were found severely injured.

Mr. James Laughland, Agronomy Dept., O.A.C., reports that oat and barley plants infested by nematodes were sent in by Agricultural Representatives from 27 counties, but the nematodes have not been identified to species. However, it is suspected that

Heterodera schachtii was present in some fields for some of the samples were taken from fields where the crop was making poor growth. (J.E. Howitt)

BARLEY

STEM RUST (Puccinia graminis) was first observed in the eastern sections of Alta. on Aug. 24, when infection was a trace to slight. Infections up to 5% were present on late stands at Red Deer, Claresholm, and Lethbridge. Stem rust infections varied from 20-30% on heavy crops in moister sections of Sask.; a trace was present in the drier areas. The rust was heavy in one field in Oxford county, Ont. Most varieties showed at least a trace at Ste. Anne de la Pocatiere, Que., the highest infection being 15% on Pontiac.

Only traces of stem rust were found in the Maritime Provinces in 1938 (I.L. Conners). It was heavy in a late planting at Valleyfield, P.E.I., in Sept. (R.R. Hurst)

LEAF RUST (Puccinia anomala) was severe in a field of barley near Duncan, B.C. In 1937 Trebi barley on this Illustration Station yielded 65 bu.; in 1938 the yield was reduced to 28 bu. It is believed the reduction was due to leaf rust. A sprinkling of leaf rust was observed in many localities in Man. this year. A heavy infection occurred on barley varieties in the Winnipeg area. Infection ranged as high as 50% in some cases. Traces of rust occurred on a few varieties in the plots at Ste. Anne de la Pocatiere, Que., with 10% on Peatland. Leaf rust occurred sporadically in the Maritime provinces the highest infection being 20%.

LOOSE SMUT (Ustilago nuda) was recorded as follows: a trace in two fields out of 35 in Alta.; a trace in 4 fields out of 14 examined in Sask.; a trace and 5% in two fields in Oxford county, Ont. In the Fredericton Station plots, 25% of the heads of Newall were affected (J. McKenzie). In the Maritime provinces loose smut occurred in 22 out of 60 fields examined and the average infection was less than 0.5%. The highest infection was 5% at Kensington, P.E.I. In an independent survey of 50 fields in Kensington, P.E.I. In an independent survey of 50 fields in P.E.I., Mr. Hurst found an average infection of 0.5%. (I.L.Conners)

COVERED SMUT (Ustilago Hordei) was found in 12 fields in Alta. as follows: a trace in one field; 1-2% in 5; 5% in 4, and

10% in 2. A trace was recorded in one field in Sask. It was observed in 34 fields in the Maritime Provinces, the average infection being 1%. In two fields one at Collette Village, N.B., and another at Egmont Bay, P.E.I., infection was 10%.

STRIPE (Helminthosporium gramineum) was recorded as follows: slight infection in a field in Alta.; a trace at Estevan, Sask.; a trace to slight at Lindsay, Ont., and a trace near Pictou and at Brule, N.S. This appears to be the first authentic report of barley stripe in the field in the Maritime provinces. (I.L. Conners)

FALSE STRIPE (cause unknown). A trace was found at Neepawa, Man., and near Pictou, N.S.

NET BLOTCH (Helminthosporium teres) was present in 3 fields, infection being severe in one at Edmonton, Alta. A slight infection was found in 7 fields out of 18 examined in Man. Net blotch was recorded in 60 out of 61 fields in the Maritime Provinces and it was moderate to severe in 25. (I.L. Conners)

SPOT BLOTCH (Helminthosporium sativum). A trace was present on barley on July 7 at Windermere, B.C. A trace to slight infection occurred in 8 fields out of 35 examined in Alta. It was severe on Charlottetown 80 at the Charlottetown Station, P.E.I.

COMMON ROOT ROT (Helminthosporium sativum and Fusarium spp.) caused a trace to moderate damage in 5 fields in Alta. Damage was moderate in 11 fields in Sask. The disease was reported as severe in patches at Holland and Angusville, Man.

BROWNING ROOT ROT (Pythium spp.) was reported on June 17 as very severe on Mensury barley at Swan River, Man. The fungus was found in the infected roots. (F.J. Greaney)

HEAD BLIGHT (Helminthosporium sativum and Fusarium spp.) was present about Woodstock, Ont., but the damage was slight. Isolations made from kernels from diseased heads yielded Fusarium Poae in most cases. This was also true for isolations from wheat and oats (G.A. Scott and W.L. Gordon). A trace of head blight was present in 27 fields and it caused slight damage in 18 others out of 54 examined in N.B., N.S., and P.E.I. Isolations were made by Dr. W.L. Gordon from 24 samples as follows: Fusarium Poae, 91 isolations; Alternaria spp., 52; Helminthosporium sativum, 49; Epicoccum purpurascens, 9; H. teres, 8; F. avenaceum, 7; F. culmorum, 5; Sporotrichum sp., 1. The Fusarium spp. predominated

in 9 samples, Helminthosporium sativum in 5, and the infection was mixed and of little consequence in the others. (I.L. Conners)

ERGOT (Claviceps purpurea). A trace was found in Charlottetown 80 at Charlottetown, P.E.I.

POWDERY MILDEW (Erysiphe graminis) moderately infected barley in a greenhouse at Edmonton, Alta. It was found in 2 fields in Man.; infection was moderately severe at Ochre River. Powdery mildew was present in 4 fields in the Maritime Provinces; infection was moderate at Tatamagouche, N.S.

BACTERIAL BLIGHT (Phytomonas translucens) slightly infected one field at Edmonton, Alta., and one at Winnipeg, Man.

BASAL GLUME ROT (Phytomonas atrofaciens). A slight infection was found on barley at Winnipeg. (W.A.F. Hagborg)

SCALD (Rhynchosporium Secalis) was severe in one field, moderate in 3, and a trace in 4 out of 35 fields inspected in Alta.

RYE

STEM RUST (Puccinia graminis). Traces were observed in the winter rye plots at Lethbridge. Infection was slight in a field at Montmartre and another at Saskatoon, Sask. A trace of rust occurred at Ethelbert and Ashville, Man., and slight infection at Bowsman. Traces occurred in the plots at Ste. Anne de la Pocatiere and Lennoxville, Que., and small amounts of rust were present in 2 fields, one in N.B. and a second in N.S.

LEAF RUST (Puccinia secalina). Traces to slight amounts of rust were recorded at 5 places in Sask., 2 in Man., one in Que., and one in N.S.

ERGOT (Claviceps purpurea) was found as follows: a trace in 2 fields in southern Alta.; moderate infection in one at Edmonton; a trace at Indian Head, Sask., severe at the Kentville Station, N.S.; and a trace in one field in N.B.