I. DISEASES OF CEREAL CROPS

WHEAT

STEM RUST (Puccinia graminis) moderately infected winter wheat at the Sub-Station, Creston, B.C. (G.E. Woolliams). It slightly infected Marquis at the same Sub-Station, but no stem rust was observed on Vancouver Island and the Lower Mainland. (W.R. Foster)

Stem rust was first observed at Edmonton, Alta., on August 3, as an isolated, quite severe infection. It was not found at Lacombe until August 12. Traces of rust were present in most late-maturing fields from Edmonton to Lethbridge on August 18. The heaviest infections were, however, within a forty-mile radius directly north-east of Edmonton, but in all fields, the infections were slight, even on late crops and they caused no damage. (G.B. Sanford)

A severe outbreak of stem rust occurred in a small area northwest of Swift Current, Sask., near Abbey and Cabri. The crop was late and heavy and consisted mostly of susceptible varieties. Elsewhere in the province traces of stem rust could always be found, although in an occasional field the infection was slight. Except in the area mentioned, no damage occurred. Stem rust was first observed in the south at Wawata on July 7, and in the north at Rosthern on July 18. (P.W. Simmonds)

For the first time in at least a decade, stem rust of wheat caused only minor losses in Manitoba. Approximately 77% of the wheat acreage of the province was sown to the new rust-resistant wheat varieties, Thatcher and Renown; about 18% to durum varieties, chiefly Mindum; and the remaining 5% to Marquis, Ceres, Reward, and other susceptible varieties. Only very slight traces of stem rust occurred on Thatcher and Renown. In fact, only occasional pustules were found on a small percentage of the stems of these two varieties and they suffered no reductions in yield from stem rust. Infections of stem rust were first observed in Manitoba this year on July 3. Owing to the extremely dry weather conditions which prevailed throughout most of Manitoba during July and early August, rust developed very slowly and infections on Marquis, Ceres, and Reward, ranged from 5 to 20% in intensity when the rust had reached its maximum. The hot, dry weather hastened the maturing of the crops and the susceptible varieties ripened before the rust increased sufficiently to cause appreciable damage.

The large acreage sown to varieties resistant to stem rust in the spring-wheat region of the United States and in the eastern part of the wheat-growing area of the Prairie Provinces no doubt reduced the amount of rust inoculum, which reached susceptible wheat fields in this area, much

below what it would have been had the whole area been sown to susceptible varieties. This reduction of potential inoculum within the spring wheat area, however, was not the only factor retarding the development of rust in 1939. Two other important factors tended to hold rust in check. First, stem rust was much less prevalent than normal in the winter wheat area of the United States and consequently the primary inoculum available for initiation of stem rust in the spring wheat area was less than usual. Secondly, adverse weather conditions during July and early August retarded rust development. (B. Peturson)

Stem rust was practically absent in eastern Ontario and Quebec, but in one field at Ste. Martine, a 20% infection was recorded. In the Maritime Provinces stem rust was distinctly more prevalent. While less than half of the fields were affected, individual infections ranging from 10 to 45% were recorded in 1 field in P.E.I., 3 fields in N.B., and 8 fields in N.S. These low percentages of rust are in marked contrast to the moderate to severe infection present on susceptible varieties in 1937 and 1938. Several fields of Coronation were examined in each of the provinces, but they appeared to be free from stem rust.

LEAF RUST (Puccinia triticina) was severe on Thatcher at the Agassiz and Sidney Stations of B.C., and much less prevalent on other varieties. At the Creston Sub-Station it was heavy on Marquis, Red Bobs, and Thatcher.

Leaf rust was relatively scarce in Alberta. It was first observed at Edmonton on July 21. Infection was slight in 2 fields near Peace River and slight to moderate in several fields between Lacombe and Calgary.

Leaf rust was first recorded at Rosthern, Sask., on July 18. Later in the season, it was very common over the province, many fields showing heavy infection, especially in the northern section of the cultivated area.

Leaf rust of wheat was present throughout the whole of Manitoba and was much more prevalent than stem rust. Infections on Renown ranged from a trace to 20%, and on Thatcher, from 5 to 60%. Only slight traces of leaf rust occurred on durum varieties. In general the lighter infections occurred on the early crops and the heavier infections on the late crops.

Fairly high percentages of leaf rust were recorded on susceptible wheat varieties in Ont., Que., N.B., N.S., and P.E.I., in both fields and plots. Of the new varieties resistant to stem rust, Thatcher and Apex are very susceptible, while Coronation, Regent, Renown (selection) are highly resistant. New unnamed varieties, which were equally resistant to leaf rust as Coronation were C-26-123.9, R.L. 1114, and R.L. 1005; R.L. 1165 and C-26-44.7 were somewhat more susceptible.

STRIPE RUST (Puccinia glumarum). A trace of stripe rust was found on Jones' Fife in May at the Sidney Station, B.C. Stripe rust was not recorded on wheat and it was relatively scarce and difficult to find on Hordeum jubatum in Alberta. A trace was recorded on the latter at Grande Prairie on August 10, and occasional infections were observed as far east as Lloydminster and Wainwright on September 12.

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 Mr. W. Popp.

Table 1. Wheat Bunt in Western Canada

Summary of Inspections from August 1 to October 31, 1939.

Class of Wheat	Cars Inspected	Cars Graded Smutty	Percentage Smutty
Hard Red Spring	103,397	207	0.2
Garnet	2,559	3	0.1
Amber Durum	3,961	48	1.2
White Spring	1	0	0.0
Alberta Red Winter	207	24	11.6
All classes (including mixed classes)	110,264	282	0.26

The figures for the first quarter of the 1939-40 crop year suggest little change in the bunt situation from previous crop years. Since 1932 the percentage of cars in durum wheat graded smutty has fluctuated between 0.1% (in 1937) and 1.2%, with an average of 0.7% per annum. In the same period 0.45% of the cars of Hard Red Spring has been graded smutty. The low figure for Garnet wheat suggests that the percentage of cars graded smutty of one class or variety of wheat is a direct reflection of its susceptibility or resistance to bunt. The relatively high susceptibility of durum wheat to bunt emphasizes the need of continuing energetic extension work among durum wheat growers, if bunt in durum wheat is to be kept down. The percentage of bunt in Alberta Red Winter is somewhat lower than usual, but it is still very high.

Bunt was found affecting 5% of the heads in 3 fields and in lesser amounts in 7 others, out of 176 fields examined in Alberta. Also infection ranged from 2 to 8% in 5 fields of winter wheat out of 15 examined in south-western Alberta. A trace was recorded in one field at Mozart, Sask.

Bunt was reported to be common and severe in certain areas in Kent Co., N.B. It was severe at St. Ignace this year.

LOOSE SMUT (Ustilago Tritici) was reported in small amounts in Western Canada as follows: 2% in one field, trace in 3 others in Alta.; a light infection in the University plots, Saskatoon, Sask.; 3% in a field of durum wheat at St. Adolphe, Man., and traces in two others, and 0.5% in 2 fields of common wheat and traces in two others. Loose smut infections were similarly low in Que., N.B., N.S., and P.E.I. The average infection was about 0.2%; the highest infections were: 5% at Rexton and St. Charles, N.B. and 4% at Napierville, Que.

BLACK CHAFF (Phytomonas translucens var. undulosa) was isolated from the leaves, neck, and glumes of affected Thatcher wheat received from Melfort, Sask. Damage was very marked. The kernels were definitely shrivelled and the lesions were so extensive that the green area of the plants was much reduced. (W.A.F. Hagborg)

Black chaff was found in 19 out of 63 fields examined in Man. Infection was heavy in an area north-east of Portage la Prairie and also near Virden. (W.A.F. Hagborg)

BASAL GLUME ROT (Phytomonas atrofaciens). The organism was isolated from severely affected specimens of Regent wheat showing both leaf and head infections. The specimens were sent by Prof. T.C. Vanterpool from Gronlid, Sask. The disease was also found on specimens from Alford. Out of 45 collections made in Manitoba, the organism was isolated from 8 collections. Of these eight, only one showed the typical discoloration at the base of the glumes, while 3 resembled black chaff, 3 bore leaf infections, and one showed an internodal discoloration. (W.A.F. Hagborg)

ERGOT (Claviceps purpurea) was reported as follows: trace infection in 3 fields at Innisfail, Alta.; slight infection in one at Lethbridge, and another at Wetaskiwin; a trace in the plots at Nappan, N.S. and in a field at McAras Brook; trace in a late field in Queens Co., P.E.I.

GLUME BLOTCH (Septoria nodorum) was found in the Peace River district of Alberta; infection was severe in one field at Wembly and slight in three other fields and in the plots at Beaverlodge. It was observed in material from Glen Bain, Sask. Septoria nodorum was isolated by Dr. T. Johnson from 23 of the 31 samples of discoloured wheat heads collected in Quebec and the Maritime Provinces and it was the principal fungus present in 18. Pycnidia of the fungus were visible on over half the samples. The

amount of discoloration did not appear to be correlated with the presence of the fungus. In Quebec, glume blotch was frequently encountered on glumes and leaves in wheat plots; there appeared to be considerable difference in varietal susceptibility. Glume blotch was also present to a slight extent on the varieties at Kapuskasing, Ont.

SPECKLED LEAF BLOTCH (Septoria Tritici) was reported in 45 out of 176 fields examined in Alberta; infection was a trace in 12 fields, slight in 26, moderate in 6 and severe in one in the Peace River district. The disease was also slight to moderate in the plots at Beaverlodge and Lacombe. (M.W. Cormack)

Leaf spots, mostly undetermined, caused slight damage in 15 out of 59 fields in Sask. S. nodorum was identified in material collected at Shipmen and Saskatoon, while S. Tritici, which is rarely collected in Sask., was also present in a collection from Naicam.

FOOT ROTS. Take All (Ophiobolus graminis) was severe in a 4-acre field at the Sidney Station, B.C. (W.R. Foster)

Take All was reported from 53 out of 176 fields examined in Alta. Slight to moderate infection was found in nearly all the wheat fields examined in the Grande Prairie, Hythe, and Pouce Coupe districts of the Peace River area and in 10 fields the damage ranged from 10 to 25%. Some varieties were severely damaged in the plots at Beaverlodge. Infection was also general in the Camrose district and in 6 fields it caused 5 to 15% damage. Traces of the disease were present in the plots at Olds.

Common Root Rot (Helminthosporium sativum and Fusarium spp.) was reported in 93 fields - trace in 49, slight in 23, moderate in 15, and severe in 6 fields, the latter all located in the Peace River district. Infection was moderate in the plots at Beaverlodge. Many areas were not surveyed this year owing to the extremely dry conditions, which prevailed in July and August, except in the Peace River district. Root-rot damage was found associated with winter injury in the winter wheat plots at Lacombe and Edmonton. Damage ranged from slight to severe in the different varieties at Lacombe. Fusarium spp. were apparently the principal pathogens. (M.W. Cormack)

Take All was found in 7 fields in zones 2 and 3 out of 107 examined in Saskatchewan, causing a trace to slight damage; diseased specimens were received from 4 other places. Common Root Rot was present in 105 of the 107 fields examined, damage was moderate in zone 1, and slight in zones 2 and 3. Specimens affected with Prematurity Blight (cause unknown) were received from 5 points.

A moderate infection of Take All was reported from Swan River, Man., on Thatcher wheat. Common Root Rot was very slight during May and June in all fields examined. Infection increased rapidly in July, when every field showed at least slight infection. The disease was generally more severe on durum than on common wheat. (J.E. Machacek)

In an attempt to obtain more accurate information on the effect of common root rot on the yield of wheat in Manitoba, it was decided to collect samples from at least 10 fields in each of the major soil zones of the Province while the grain was ripe, but not cut. During a preliminary survey when the wheat crop was approaching maturity the order in which the soil zones should be visited and the approximate location of the fields were determined. In all, samples were taken from 61 fields.

The method of collecting the samples was to choose a point 50 paces from the edge of the selected field; pull all the plants in a one-meter length of drill row, which were then tied into a bundle; then proceed 50 paces parallel to the edge of the field and collect another sample, repeating the operation until ten one-meter lengths of drill row were collected. The ten small bundles were tied together into one large bundle, wrapped to protect the heads from injury and tagged. At the same time the field condition, wheat variety, and soil type were recorded.

At the Laboratory the plants in each bundle were classified into - (1) healthy, (2) slightly root-rotted, (3) moderately root-rotted, and (4) severely root-rotted according to the lesions on the subcrown internode. The number of plants in each class was counted, each class was threshed separately, and the weight of grain obtained.

From Table 2 it will be seen that the percentage of plants diseased was 21.9% and the average loss in yield was 7.5%. The most striking result was the loss in yield induced by a slight amount of root rot. The plants placed in this class bore very small lesions on the subcrown internode, but they had conspicuously fewer culms per plant than those in the "healthy" class. The length of spike and the number of kernels per spike were not apparently reduced. In the "moderately diseased" class the plants were usually somewhat stunted and possessed single culms with shortened spikes. The plants in the "severely diseased" class were conspicuously stunted with single culms and very small or no spikes. (J.E. Machacek)

Take All was observed on plants of Coronation wheat sent from a small field at Chambord, Que. (J.E. Machacek and R.C. Russell). This is the first report of Take All in Quebec. The variety was slightly affected. (I.L. Conners)

Table 2 - Damage to common wheat from common root rot in Manitoba in 1939.

	Soil Zone							
	A_1 1/	A_2 East part	A_2 West part	A_2 Both parts	A_3	A_5	A_7	Mean all zones
Plants in sample	308.3	399.1	387.8	394.0	335.0	411.7	404.0	373.4
Yield, healthy plants (grams)	0.896	0.651	0.619	0.637	0.831	0.815	0.515	0.721
Diseased plants (%)	29.2	17.2	24.3	20.4	20.5	21.9	16.2	21.9
Reduction in yield (%)	11.8	5.7	7.5	6.6	5.6	10.7	6.7	7.5
Reduction in yield shown by plants (%):								
(a) slightly root-rotted	38.9	25.5	21.4	23.8	16.8	44.1	26.3	27.5
(b) moderately " "	38.8	51.3	40.6	45.3	38.4	53.1	57.3	41.5
(c) severely " "	68.6	87.0	60.9	68.3	70.4	90.6	90.0	72.6

1/ Soil zones A_1 - Dark brown steppe - black earth transition

A_2 - Black earth

A_3 - Northern black earth and degrading black earth

A_5 - Degrading black earth and grey wooded

A_7 - Rendzina (high lime) and degrading Rendzina

For a map showing these zones see fig. 14 in Ellis, J.H., The Soils of Manitoba. Project 14, Economic Survey Board, Province of Manitoba, 1938.

NODE DECAY (Fusarium Poae). A trace of infection was found on the nodes of wheat at Winnipeg at threshing time. Fusarium Poae was isolated. (W.L. Gordon)

ROOT ROT (Cryptoascus sp.) was found moderately affecting wheat at Churchill and Elmira, P.E.I. in 1939. The disease has been found widely distributed in P.E.I. on the roots of wheat and barley since it was first discovered in 1937, at the Experimental Station, Charlottetown. (R.R. Hurst)

BROWNING ROOT ROT (Pythium spp.) was found in 46 out of about 80 fields of wheat examined in June in Alberta. It was estimated to have caused slight damage in 12 fields, moderate in 18 and severe in 6. Many of the fields made a partial recovery later in the season. The disease was reported on heavy and light soils and from nearly all the cultivated sections of the province. (M.W. Cormack)

Browning root rot was most severe in an area between Calgary and Crossfield, an area, where it had not been observed previously. Wheat sown early in a relatively dry summerfallow apparently was not damaged, but very definite injury occurred to both wheat and oats sown on ploughed wheat stubble land. Even wild oats (Avena fatua) were attacked. Oospores were fairly abundant in the roots of affected plants. It is thought that the heavy precipitation which followed the early seeding favoured the development of the disease. (G.B. Sanford)

Browning root rot was prevalent in a number of districts of Alberta. Specimens were received from Thorsby, Mirror, Morrin, and Strathmore. A dozen or more fields were examined in the heavy soil region around Morrin in mid-June. The disease was most conspicuous on wheat on summerfallow and the damage appeared serious at that time. Some fields looked as if they would not yield a half a crop. Reports since harvest, however, indicate that affected crops made a remarkable recovery and yielded well. (A.W. Henry)

Browning root rot began to show up on wheat on summer fallow in Saskatchewan on June 3, which is about the usual date, but it was evident in many localities in a severe and readily observable form until the first week of July, which is one to two weeks later than usual.

Although moisture conditions had been good all spring and the general condition of the crops better than normal, the number of fields that showed a high percentage of browning zones and severe root lesioning was large throughout the northern half of the wheat-growing area. More crown roots than usual became diseased at their tips before they had a length of one to two inches. The relatively low temperatures in many

districts possibly slowed up the growth of the crown roots and in this way increased the chances for attack from Pythium and other root-infecting fungi. A microscopic examination showed that 68% of the lesions contained oospores.

By the third week in July, it was difficult in many instances to detect the diseased areas from the road, so that the impression was gained that recovery had occurred. Closer examination revealed, however, that recovery was only partial, for the diseased patches were thinner and more weedy, due to the reduced tillering, and height of the affected plants. Towards maturity, differences were again observable from the road. The diseased areas were delayed in maturing and stood out as green islands among the ripening healthy zones. Browning was most common on medium to heavy land (silt loam) this year.

Apex and Thatcher appeared to be free from the disease on one farm at Blucher, while Marquis was severely attacked. Thatcher showed considerably more field resistance than Reward on another farm at Hague. In this same field some Thatcher on fall ploughing was free from the disease. Near Humboldt one field of Thatcher was moderately attacked. This field evidence is in agreement with greenhouse results on varietal susceptibility.

The importance of the proper light conditions in detecting diseased fields should be pointed out. Favourable conditions prevail when the sun is in front or to the right or left of the observer-driver. A following sun is usually not so good. Dull conditions are not favourable, for it is then difficult to detect slightly damaged fields.

One wheat field on a peaty soil showed leaf discoloration resembling browning root rot, but root lesioning was not observed. However, wheat grown in the greenhouse in soil collected from this field developed typical root lesions from which Pythium arrhenomanes was isolated.

The average yield of diseased plants from six fields was 35% less than that of the same number of healthy plants. This reduction in yield was due mainly to the poor tillering and slightly shorter heads of diseased plants. This year the grain from diseased plants was, in general, as plump as the grain from healthy plants. This is not usually the case.

Couch grass (Agropyron repens) and green foxtail (Setaria viridis), a very susceptible grass, were found attacked in the field. Dr. G.B. Sanford sent in some wild oats (Avena fatua) from Alberta affected with browning root rot.

Browning root rot was clear-cut this year and its economic importance was strikingly brought out by its curtailment of tillering, retardation of growth, and delaying of maturity.

Browning was severe along the following routes: between Landis and Cathkin, Rosthern and Hague, Wakawa and Domremy, Birch Hills and Weldon.

The estimated average reduction in yield on affected fields in these districts was 10% or more. A particularly bad field south of Landis with 80% browning was estimated to be reduced in yield from 25 to 30%. (T.C. Vanterpool)

Browning root-rot was found in 3 places in Manitoba; infection was moderate at Brandon and slight at Rapid City and Swan River. The disease was much less evident than in 1937. (J.E. Machacek)

HEAD BLIGHT (chiefly Fusarium spp.). Traces, or occasionally slight infections of head blight were fairly common in Quebec both in fields and plots. At most Stations several varieties were affected. Sporodochia of Fusarium were frequently observed on the diseased spikelets. The disease was also present in the Maritime Provinces, but it was recorded less frequently. Isolations were made by Dr. W.L. Gordon from 18 head blight samples as follows: Quebec, 12 samples - Fusarium graminearum in 9 samples (43 isolations), F. avenaceum, 5 (17), F. Poae, 1 (1), F. Equiseti, 1 (1), Alternaria, 7 (9), Hormodendron, 1 (1), Epicoccum purpurascens, 1 (1); New Brunswick, 4 samples - F. graminearum, 3 (5), F. avenaceum, 2 (12), F. Poae, 2 (6), F. culmorum, 1 (1), Alternaria, 1 (4); Nova Scotia, 2 samples - F. avenaceum, 1 (1), Alternaria, 1 (5), Helminthosporium sativum, 1 (1). The frequent isolation of F. graminearum, the imperfect stage of G. Saubinetii, is worthy of note.

HEAD DISCOLORATION (Alternaria, Cladosporium, etc.). Head specimens of newly-developed and standard wheat varieties were collected from all the provinces of Canada. Where the heads showed evidence of a diseased condition, isolation studies were made to determine what, if any micro-organisms were associated with it. In Saskatchewan and Alberta, the heads of all varieties were generally free from disease. In all the other provinces, disease symptoms were present to a greater or less degree. In British Columbia, species of Alternaria, Cladosporium, and Pullularia were the organisms associated with the severe head discoloration common in that province. Alternaria was also commonly isolated from discoloured heads collected in Man., Ont., and Que. In Que., and the Maritime Provinces, glume blotch (see p. 4) was common and while Septoria nodorum was the organism most commonly isolated, Alternaria was present in most samples. Isolations made from 31 samples were as follows: Septoria nodorum in 23 samples (138 isolations), Alternaria (mostly tenuis type)

25 (97), Epicoccum purpurascens 5 (8), Cladosporium ?herbarum, 8 (9), Pullularia pullulans 8 (12), Helminthosporium sativum 3 (5), Macrosporium 1 (1). (T. Johnson) This spotting was observed in Apex wheat from several points in Saskatchewan.

E.S. McFadden (Jour. Agr. Res. 58:805-819. 1939) has given the name "brown necrosis" to a discoloration found on heads and culms of certain rust-resistant varieties of wheat, which he has found associated with rust infection in these varieties. Part of the discoloration reported above is this type, where it occurs on Coronation and other new rust-resistant varieties. (T. Johnson)

Under the name, false black chaff, 60% of the heads of a Hope cross at Olds, Alta., were reported affected. A trace was reported at Winkler and Killarney, Man.

KERNEL SMUDGE (Helminthosporium sativum etc.). A summary of the kernel smudge situation in Western Canada in 1938 and 1939 was prepared from the records of the Western Grain Inspection Division, Winnipeg, Man. The results of this survey are presented in Table 3.

Table 3. Kernel Smudge of wheat in Western Canada in 1938 and 1939. (A summary of car inspections from August 1 to October 31, 1938 and 1939).

Year	Class of Wheat	Cars inspected	Cars with Kernel Smudge	Percentage with Kernel Smudge	Percentage of smudged kernels in car samples	
					Range	Mean
1938	Amber Durum	6,774	1,720	25.4	5-58	24.4
	Hard Red Spring	66,558	0	0.0	-	-
1939	Amber Durum	3,631	10	0.3	1-9	3.2
	Hard Red Spring	103,250	0	0.0	-	-

In 1938, 51.7% of cars of durum wheat from the Red River Valley district of Manitoba had kernel smudge marked against them. The percentage of cars with kernel smudge decreased from east to west in Manitoba and Saskatchewan. For example, only 5.1% of the cars shipped from the southwestern crop district of Manitoba had kernel smudge, while of 344 cars of durum wheat from Saskatchewan points in 1938, only 6 cars, or 1.7% were recorded as having kernel smudge in them. Losses from this disease, owing to lowering of commercial grade, were of considerable economic importance in 1938, particularly in the eastern crop districts of Manitoba. Only a few scattered light infections of kernel smudge occurred in Western Canada in 1939. The disease was of no economic importance in that year.

A study of the internal fungus flora of a large number of samples of wheat infected with kernel smudge showed that, although a great number of different fungi were found in the kernels, Helminthosporium sativum and species of Alternaria were the predominating fungi associated with kernel smudge or black point of wheat. (F.J. Greaney)

POWDERY MILDEW (Erysiphe graminis) was observed on the wheat varieties in 7 of the 19 uniform rust nurseries located across the Dominion. These seven were - Saanichton, Smithers, and Agassiz, B.C.; Beaverlodge, Edmonton and Lethbridge, Alta.; Kapuskasing and St. Catharines, Ont.; and Macdonald College, Que. (M. Newton). Infection was slight to moderate in 8 out of 62 fields examined in the Peace River district, Alta. The disease was moderate to severe on many varieties at Beaverlodge while infection was slight on a few varieties at Edmonton and Lacombe. A slight infection occurred at St. Louis and Shipman, Sask. Powdery mildew was abundant on some varieties at Macdonald College, Que. (I.H. Crowell)

YELLOW LEAF BLOTCH (Pyrenophora Tritici-repentis (Helminthosporium Tritici-repentis) appeared in epidemic proportions over most of the wheat-growing area of Manitoba, south of the Riding Mountains and west of the Red River. The disease was most severe in the southwestern part of the province. Specimens of the disease were also received from Saskatchewan and Quebec.

Helminthosporium Tritici-repentis was originally described in 1902 by Diedicke, who found it attacking the leaves of Agropyron repens. He also observed the perithecial stage on the dead culms of the host. In 1923, Drechsler (Jour. Agr. Res. 24:641-739. 1923) reported that the fungus was very prevalent on A. repens in the northern part of the United States.

A similar fungus on wheat was described by Nisikado (R.A.M. 8:164) in Japan in 1939. He named it Helminthosporium Tritici-vulgaris. After a preliminary announcement in 1931 (R.A.M. 10:426), Mitra described in detail a fungus, which he considered identical with H. Tritici-repentis and which he found causing considerable damage to wheat in India (R.A.M. 14:90). The first European report of the disease on wheat was that of Raabe (Phytopath. Zeitschrift. 10:111-112. 1937), who referred the pathogen to H. Tritici-vulgaris. Raabe's illustrations strongly suggest that the disease as it occurs in Germany is identical with that in Manitoba. It is very probable, on account of the similarity of the descriptions of H. Tritici-vulgaris and H. Tritici-repentis that the names are synonymous and that the fungus on wheat should be called H. Tritici-repentis.

In Canada, the fungus was first observed on dead culms of Marquis wheat, collected at Assiniboia, in southern Saskatchewan on July 7, 1927. Both conidia and perithecia were found. On June 26, 1928 Dr. B.J. Sallans collected the perithecial stage on wheat straw at Fillmore, also in southern Saskatchewan. In Manitoba the fungus was first observed on living plants of Elymus canadensis in June, 1934, near Carmen (P.D.S. 14:100). This appears to be the first record of its occurrence on this host. On July 16, 1937 the fungus was discovered on leaves of Mindum wheat near Medora, Man. (P.D.S. 17:5). This appears to be the first report of the disease on wheat in North America. The original collection on wheat was made about 2 miles west of Medora and about 8 miles east of Melita, a somewhat larger place, which was given as the place of collection in P.D.S. 17:5. This report is also in error in stating that the fungus has been collected on Agropyron repens in Manitoba.

In 1939, the disease was first observed in early July. At that time the affected leaves and leaf sheaths showed pale yellow, irregularly oval mottlings, which were more or less uniformly distributed over their surface. The spots shortly afterwards turned brown and often coalesced to form streaks traversing the middle of the leaf. The diseased leaves withered prematurely. In durum wheats, which seemed particularly susceptible, all the leaves were frequently affected, but in the common wheats only the lower leaves usually showed the disease. However, all durum varieties are apparently not equally susceptible, for in the experimental plots at Brandon some varieties and hybrids were practically free from disease, while others were severely attacked.

In Manitoba, conidia of the fungus are not produced freely on the affected host. Conidiophores are sparsely formed in old diseased lesions and the conidia apparently separate from the conidiophore shortly after they are formed. Thus, conidia are not abundant on diseased specimens. The conidia resemble those of Helminthosporium teres, but are usually longer, more regular, and possess a conical basal cell, instead of a hemi-ellipsoidal one usually found in H. teres. In most conidia, the basal cell is distinctly swollen just below the lowest septum, causing the cell to resemble a snake's head. The conidia germinated in water after the infected material was stored for two months in the Laboratory at room temperature.

In Canada the fungus apparently overwinters on infected straw and stubble of wheat and on the dead culms and leaves of certain grass hosts. The perithecia mature in June, when the ascospores are discharged. Perithecia are abundant, but conidia are scarce on such material. Perithecia also form readily on various media in the Laboratory, but no suitable artificial medium for conidial fructification has yet been found

by the writer. Media consisting of autoclaved straw or ground oat-hull mash have proven very suitable for perithecial development.

An epidemic of yellow leaf blotch, such as was experienced in Manitoba in 1939, is possible only when inoculum is abundant. The factors responsible are thought to be the ease with which perithecia form on infected plant debris, particularly wheat straw and stubble, and the recent considerable increase in the use of one-way discs, which fail to cover stubble with soil as does the mould-board plough. (J.E. Machacek)

Yellow leaf blotch was reported as follows in Man.: Common wheat - infection, trace in 4 fields, slight in 9, moderate in 11, and severe in 4; durum wheat - infection, trace in 1, slight in 4, moderate in 8, and severe in 7. This disease was rather common at Saskatoon, Sask. It was particularly common one season several years ago at Indian Head (P.M. Simmonds). The disease occurred in definite, small rather conspicuous zones in one field of wheat on stubble in zone 3 (T.C. Vanterpool). Traces of yellow leaf blotch were found on leaves of Renown from Lennoxville, Que., and on durum wheat from St. Bernard. (J.E. Machacek). This is the first report for Quebec.

SPOT BLOTCH (Helminthosporium sativum). A trace of infection was reported from Portage la Prairie. H. sativum was found fruiting on the leaves of wheat at Lennoxville, Que., but the infection appeared to be secondary.

ANTHRACNOSE (Colletotrichum graminicola). A trace was found on the leaves in a collection made at Saskatoon, Sask.

CLADOSPORIUM LEAF SPOT (C. graminum) moderately to severely infected several varieties and strains of winter wheat in the plots at Edmonton, Alta., early in the season. (M.W. Cormack)

BRITTLE DWARF (Cause unknown) caused slight damage to plants in the borders of the plots of the wheat x wheat grass hybrids, F_1 Triticum pyramidale x Agropyron glaucum and Agropyron elongatum x Triticum sp., and of wheat plots at Saskatoon, Sask.

ALKALI INJURY was severe to moderate, at least in patches at Brandon, Pine River, Thornhill, Lowe Farm, and McCreary, Man.

WHITE TIP (Non-parasitic) was slight to moderate in 7 and severe in 1 out of 62 fields in the Peace River district, Alta. Most of the varieties were slightly to moderately affected in the plots at Beaverlodge.

OATS

STEM RUST (Puccinia graminis). Traces were present on Mabel, but not on the other varieties at Agassiz, B.C. on July 25. Stem rust was extremely scarce and was not recorded until mid-August in Alberta; trace to slight infections were observed in the Camrose and Wetaskiwin districts. Traces of rust, sometimes on all the stems in the field, were found in the northeastern sections of Saskatchewan; in other sections it was practically absent. In one field near Kamsack, infection was severe.

Stem rust of oats, although occurring in all parts of Manitoba, was generally very light. The earliest crops carried infections ranging from a trace to 1.0%. The infection on the susceptible oat varieties such as Victory and Banner averaged less that 5% on most of the crop. Only very slight traces of stem rust occurred on Vanguard and Anthony. A few very late fields of susceptible oat varieties carried infections averaging 30%. However, these more heavily infected fields represented less than one per cent of the crop. Rust damage was confined entirely to these late fields and in all cases was comparatively light. (B. Peturson)

Stem rust appeared in severe epidemic form in individual fields near escaped barberry bushes in an area east of Hawkesbury, Ont., where a hedge was found on a farm. Barberries were also located on farms near Cornwall and Vankleek Hill; aecia had been fairly abundant on these bushes in the spring and substantial traces of stem rust could be found in adjacent fields. Infections ranging up to 65% were present in small patches on susceptible varieties at Almonte; it is suspected that barberries in the vicinity were responsible. Traces of stem rust were not uncommon late in the season from Quebec to Montreal, Que. Spotty infections as high as 40% were present at Compton and Lennoxville on August 7-8. At harvest time, infections ranged from 65% on Mabel, 60% on Lanark, 55% on Cartier to 12% on Banner and Erban and no rust on Vanguard. Comparable, but lower figures were also recorded by Mr. Paul Gervais in the plots at Wotton, Farnham, Compton, Lennoxville and Ste. Edwidge, which places are mostly in the Eastern Townships, where stem rust has been observed to be destructive in recent years. Barberry bushes or hedges were found at Champlain, Neuville, St. Foy, Gifford, Montmorency, Chicoutimi, and St. Felicien. Old aecia were common on the leaves, but the bushes were located, in most instances, at some distance from grain fields, so that no outbreaks were directly traceable to them. (I.L. Conners)

Stem rust was recorded in only 2 fields out of 107 examined in New Brunswick. At Douglastown, where for the third year rust has been found spreading from a single large barberry bush, 35% of rust was reported this year. At Hartland, a 3% infection was recorded and barberries were found.

In a special survey, barberries were found on 14 properties at St. Stephen, 3 at St. Andrews, 2 at Milltown, and one at Fredericton. (S.F. Clarkson)

In Nova Scotia stem rust was present in 10 fields out of 103 examined, the highest infection being 20% at East Mountain. Barberries were located at Melvern Square, Parrsboro, Wallace, and River John. Plantings are also known to occur near Great Village and Middletown and at Glenboro, New Glasgow, Grand Pre National Park and Barton. (K.A. Harrison and I.L. Conners)

In P.E.I. little more than a trace of stem rust was recorded in 8 fields out of 33 examined. However, in the plots at Charlottetown, at least 5% of rust was present on Vanguard. (Geo. W. Ayers)

CROWN RUST (Puccinia coronata). A light sprinkling of crown rust was present throughout Manitoba. Infections generally did not exceed one per cent and no appreciable damage was caused by this rust. (E. Peturson)

Crown rust was seldom more than a trace on oats in Ontario on account of the dry weather. Even near one buckthorn site near Spencerville, where crown rust has been severe in other years, only traces were present. Some rust was also present in the plots at Almonte, where buckthorns are abundant.

Crown rust was fairly common this year in Quebec in the lower, poorly-drained sections along the St. Lawrence and Richelieu Rivers. Buckthorns were encountered at St. Jacques and near Deschambault. At the former place the rust was spreading from the buckthorns to the oats; the infection was about 50%. In the 36 fields examined the average infection was less than 2% and only between Quebec and Montreal in late fields were infections of 10-20% found. Although this was the first year that detailed observations were made in Quebec, the indications were that crown rust is usually much more prevalent. The unusually dry weather in some parts of Quebec and over wide areas in the States to the south hastened the maturity of the crop and reduced inoculum. (I.L. Conners)

In the West Fredericton-Springhill area, N.B., where a localized epidemic of crown rust has been observed annually for several years, buckthorns were located in 1937. Several mature trees occur on the Odell estate and on the local golf course. The exact location of the original plantings is uncertain. No aecia were present on June 8, but a few were found on June 18. In the variety test sown at Springhill on May 7, only a trace of crown rust had developed by August 1. The slight development was probably due to the dry weather. However, a few fields of oats which were sown later in the same area showed 25% of crown rust on August 20.

In the general survey, out of 107 fields examined, no rust was present in 59, traces in 28, and percentages ranging from 35-70% in seven. Crown rust was severe in Charlotte Co. about St. Stephens, St. Andrews, and Pomeroy Ridge, infections ranging from 10-70% in every field. This fact is quite understandable since during a special survey on September 28-29, bushes, trees, and hedges were found in the first two places. Other high infections were at Norton (65%) and Gilbert Corners, near Shadiac (45%).

The uniform rust nursery was planted in 1938 near the European buckthorn hedge on the Experimental Station, Fredericton. Crown rust was severe. In 1939, the nursery was planted again on the same ground, but the hedge was removed in the fall of 1938. Crown rust was not present in the nursery plot this year. (S.F. Clarkson)

In Nova Scotia, no crown rust was observed in 21 fields, traces were present in 53, and 25-65% in 16 out of 100 examined. Outbreaks at Glenholme, Parrsboro, Pictou, and Bridgetown were definitely associated with buckthorn plantings. In addition a severe outbreak at East Mountain was observed, but a survey for buckthorns was not made. The removal of a buckthorn on the Gaspereaux Ridge has reduced crown rust infection in the district. On the other hand, hedges of buckthorn were found at Digby, Barton, Tusket, and a few large bushes were observed at Lower Argyle, but no severe outbreaks of rust occurred in the vicinity of these places. It would appear that well trimmed hedges located in towns at some distance from any fields of oats, are not liable to initiate severe outbreaks of crown rust, but where the hedges have been neglected or they have been planted in the country, they are responsible for epidemics of crown rust. (K.A. Harrison and I.L. Conners)

In P.E.I., 33 fields were examined for crown rust; no rust was present in 3, traces in 12 and readable percentages in 18. Infection was fairly heavy in the plots at Palmer Road and Charlottetown. (G.W. Ayers)

SMUT (Loose Smut, Ustilago Avenae and Covered Smut, U. Kolleri). Slight infections of loose smut were observed in the Matsqui district, B.C., but none were seen on Lulu Island or at Pemberton Meadows (W. Jones). Smut was reported in 15 out of 71 fields examined in Alberta; in the infected fields, infection varied from a trace to 10% and averaged about 2%. Covered smut was present in 19 fields out of 34 in Sask.; the average infection was a trace plus. A trace of loose smut was found in one field.

In a survey of 121 fields of oats in Manitoba, 5 fields were found to be free from smut and 5 to have from 21-30%, the remaining fields showing intermediate amounts. In the northwestern part of the province, where the spring was dry, the incidence of smut was much lower than in the

rest of the province and accounted for most of the fields with a trace to 1% of smut. For the 121 fields, the average infection was 4.4%. On this basis the loss in Manitoba would be around 2,500,000 bu., which at 40¢ per bu., would amount to $1,000,000. (W. Popp)

Loose smut was found more frequently and in higher amounts than covered smut in the 23 fields examined in Ont.; the average infection was - covered smut 0.3%, and loose smut 1%, or for both smuts 1.3%. Out of 120 fields examined in Que., covered smut was found in 95 fields and loose smut in 55. Covered smut not only occurred in more fields, but it occurred in higher amounts. The highest infections were: covered smut 25% at Larouche and near Pointe du Lac, loose smut 10% at Sorel. The average infection of covered smut was 2.2%, of loose smut 0.5% or of the two smuts, 2.7%. If 1937 crop is taken as a basis the loss is estimated at $550,000 (I.L. Conners). In N.B. smut was found in 56 fields out of 107 examined. The average infection was: covered smut 2.4%, loose smut 0.7%, or 3.1% for both smuts, representing a loss of $96,000 (S.F. Clarkson). The situation in N.S. was similar. Smut was found in 75 fields out of 96 examined. The average infection was: covered smut 1.8%, loose smut 0.5%, or 2.3% for both smuts representing a loss of $32,000 (K.A. Harrison). In P.E.I. smut was the heaviest that it had been for several years. The average infection of covered smut was 3.5% and loose smut 4.0%, with an average for both smuts of 7.5%, which represents a loss of $136,650. The highest infections were, Montague 29% (loose smut 14.5%, covered smut 14.5%), Freeland 27% (loose smut 27%, covered smut trace), Campbells Cove 35% (loose smut 6.5%, covered smut 28.5%). (G.W. Ayers)

HALO BLIGHT (Phytomonas coronafaciens) infection was a trace to slight in most of the 30 fields, in which it was observed in Alta., out of the 71 examined. In the plots at Beaverlodge infection ranged from a trace to moderate, while at Lacombe a few varieties showed a trace of halo blight.

Halo blight was found in practically every oat field examined in June, during the browning root rot survey in the northern half of the cereal growing area in Sask. Infection was slight to moderate, but in one field at Asquith and one east of Saskatoon the disease was severe. Soil from both fields was tested for manganese deficiency (grey speck) in greenhouse experiments, but no grey speck developed in untreated soil, nor was there any positive response in the manganese treated pots (T.C. Vanterpool). Halo blight was severe on some varieties at Saskatoon and the disease was moderate to slight in 14 out of 34 fields examined in July and August (H.W. Mead). In Manitoba halo blight was found in 16 fields out of 23 examined; it caused moderate damage. Two types of symptoms were noted - in some collections there was a distinct chlorotic halo about the lesion, a condition observed also after artificial inoculation; in others, the chlorosis is lacking. As neither type resembles the symptoms of stripe

blight and all the isolates appear to be P. coronafaciens all collections were referred to halo blight. The organism was also isolated from a collection made by I.L. Conners at Elmbrook, Ont. (W.A.F. Hagborg)

LEAF BLOTCH (Helminthosporium Avenae). A trace to slight infection was found in 6 fields out of 71 examined in Alberta, as well as on several varieties at Lacombe (M.W. Cormack). The disease was similarly present in 4 fields in Manitoba; infection was severe on Anthony and a trace to slight on several other varieties at Brandon. (J.E. Machacek)

In Eastern Canada, Leaf Blotch was not always separated in the field from SPECKLED LEAF BLOTCH (Leptosphaeria avenaria (Septoria Avenae), but from representative collections examined in Ottawa and by Dr. J.E. Machacek in Winnipeg, it was possible to estimate fairly accurately, the relative prevalence of the two diseases. Leaf Blotch is characterized by narrow stripes usually much longer than wide with parallel sides. Soon after the spots become necrotic the conidiophores of the fungus can be found. In Speckled Leaf Blotch, the individual spots are broadly ellipsoid on which the darker pycnidia may frequently be seen. In Ontario, a trace to slight infection of both diseases was found in a few fields. In Quebec and P.E.I. both diseases were fairly prevalent, but Leaf Blotch was, in general, more severe than Speckled Leaf Blotch. In N.B. and N.S. both diseases were about equally prevalent, being quite severe in some fields in the former province.

Re-examination of collections of leaf spots made in the Maritime Provinces in 1937 showed that Leaf Blotch was practically the only disease present. However, in 1938, Speckled Leaf Blotch was moderate in two collections, while Leaf Blotch was slight to moderate in three other collections, although at the time they were reported as Leaf Blotch. (I.L. Conners)

ANTHRACNOSE (Colletotrichum graminicola) was moderate to severe in two fields in the Peace River District, Alta.; no root rot caused by C. graminicola or any other organism was found in these fields (M.W. Cormack). A trace of anthracnose was found on Mabel in the plots at Deschambault, Que. (I.L. Conners)

HEAD BLIGHT (Fusarium spp. etc.) Traces of head blight were found both in the fields and the plots in Quebec. Diseased spikelets could usually be recognized by the diffused brownish cast of the glumes. As the kernels in diseased spikelets were more or less shrivelled away, the affected spikelets could be quickly identified by slight pressure between the thumb and fingers. Isolations were made by Dr. W.L. Gordon from 9 collections as follows: Fusarium avenaceum in 9 (24 isolations), F. graminearum in 2 (7), F. Poae 1 (5), Alternaria spp. 5 (19), Epicoccum purpurascens 2 (4), Helminthosporium sativum 1 (1). (I.L. Conners)

POWDERY MILDEW (Erysiphe graminis) was present on oats in the uniform rust nurseries at Agassiz and Saanichton, B.C. (Margaret Newton). The only previous report of powdery mildew in the field was at Macdonald College in 1923. (I.L. Conners)

BLAST (Non-parasitic) was found in all fields examined in Alberta and was recorded as follows: a trace in 31 fields, 5% of the spikelets affected in 33, 10% in 11 and 15-20% in 6; blast ranged from a trace to 25% in the varieties at Beaverlodge and Lacombe. Blast was much less prevalent this year than last in Saskatchewan; it was recorded in 12 out or 34 fields examined. The disease was severe in a field at Neepewa, Man. Blast was common and fairly prevalent in Quebec and eastern Ontario; 30% of the spikelets were blasted in a sample from a 30-acre field at Jasper, Ont. The disease was general and severe in N.B.

NEMATODES (Heterodera schachtii). Oats infested by nematodes were again sent in by Agricultural Representatives from many parts of Ontario, but no further serious widespread infestations have been reported. The situation in Waterloo County was about the same as last year. In this county, several new serious infestations have been reported, but some of the men who had lost their oat crop in previous years stated that they are overcoming the trouble by crop rotation and by increasing the fertility of their soil. (J.E. Howitt)

BARLEY

STEM RUST (Puccinia graminis) was observed only on August 15 in Alta., and was very scarce; a trace to slight infection was found in 5 fields in central Alta. Stem rust was recorded in 6 out of 12 fields examined in Sask.; infection was a trace to slight. Traces of stem rust were general on barley in Man. (B. Peturson). Traces were recorded in the plots at Morven, Ont., and in a field at Cornwall. In Quebec traces of stem rust were usually recorded, but in one field at Ste. Martine, a 35% infection was noted (I.L. Conners). No stem rust was recorded in the 23 fields examined in N.B. and 12 in P.E.I. Stem rust was present in only 4 fields out of 56 examined in N.S., but 25% and 40% were recorded at Tatamagouche and Lake Killarney, respectively. (K.A. Harrison)

LEAF RUST (Puccinia anomala). Only a single record of leaf rust was made in 1939 in Man. - a trace on Trebi at Winnipeg (B. Peturson). Low percentages were present in the plots at 2 points in Ont. Trace of leaf rust were recorded in several fields throughout Que. No leaf rust was recorded in N.B., while a trace was present in one field in P.E.I. In N.S. it was observed in 13 fields; at Central Argyle and Danesville on the south coast, infections of 100% and 50% were recorded; 50% of rust was also noted at Milford.

LOOSE SMUT (Ustilago nuda) slightly affected several varieties at Sidney, B.C. It was found in 3 out of 12 fields in Sask.; 20% of the heads were affected in one at Watrous, Loose smut caused a 10% infection at Brandon, Man., and a trace at Kane. Usually only a trace of loose smut was found in Ontario, but in one field of Nobarb 7% of the heads were affected. Of the varieties under test, Newal has repeatedly shown high amounts of smut in Eastern Canada; percentages ranging from 5 to 13% were observed in Newal at Chatterton and Lansdowne, Ont., St. Hyacinthe and Oka, Que., and Fredericton, N.B. In all, 129 fields were examined in eastern Ont., Que., N.B., N.S., and P.E.I.; no smut was recorded in 79, a trace in 41 and 1-11% in only 9 fields. The average infection was 0.3%.

COVERED SMUT (Ustilago Hordei) was found in 9 fields out of 43 examined in Alta.; 5% of the heads were affected in one field. A trace to slight infection was present in 2 fields in Sask. Traces were recorded in 4 fields in Ont. Smut was present in a number of fields in Que.; but the highest infection was only 3%. In the Maritime provinces out of 90 fields, traces were present in 31 and 1-4% in 10 fields.

STRIPE (Helminthosporium gramineum). A trace was found in 2 fields at Grande Prairie, Alta. It was recorded in 2 fields in Sask.

FALSE STRIPE (Cause unknown) was recorded in 4 fields in Man. as follows: moderate at Deloraine, slight at Pigeon Lake, trace at Poplar Point and Roblin.

NET BLOTCH (Helminthosporium teres) was present in 20 fields out of 43 examined in Alta.; infection was a trace in 5, slight in 7, moderate in 5, and severe in 3. The disease was moderate in 2 out of 12 fields in Sask. It caused slight damage in 16 out of 17 fields in Man. A trace of net blotch was seen in 3 out of 4 fields in Ont.; it was moderate on several varieties at Chatterton, Ont. Net Blotch was slight to moderate in most fields examined in Que.; it was also present in the plots, being especially heavy at Lennoxville. In the Maritime Provinces, net blotch was recorded in 73 out of 84 fields examined; infection was as follows: trace in 38, slight in 23, moderate in 10 and severe in 2.

SPOT BLOTCH (Helminthosporium sativum) infection was a trace to slight in 7 fields out of 43 examined in Alta.; a slight infection occurred on a few varieties at Lacombe, while infection was a trace to moderate in the plots at Beaverlodge. It was recorded in one field in Sask., and a trace was reported from Cypress River, Man. Spot blotch was slight in one field in Ont. The disease was slight to moderate in several fields in Que.; it was most pronounced at Lennoxville. Spot blotch was moderate in a field at Sussex, N.B. The disease was found in 18 out of 56 fields examined in N.S. as follows: trace, 13; moderate, 4; severe, 1. Spot blotch was slight to

moderate in 3 fields in P.E.I. and was fairly prevalent in the plots at Palmer Road and Charlottetown.

SPECKLED LEAF BLOTCH (Septoria Passerinii). A slight infection was found in two fields in Alta. and on several varieties in the plots at Lacombe. A trace was seen on Olli at Lennoxville, Que.

COMMON ROOT ROT (Helminthosporium sativum and Fusarium spp.) caused a trace to slight damage in 7 fields in Alta. and moderate damage in one at Crossfield. This disease caused moderate damage in 9 fields out of 12 examined in Sask.

HEAD BLIGHT (Fusarium spp., Helminthosporium sativum, etc.). Traces or occasionally heavier infections were observed in Que., N.S., and P.E.I. Isolations were made from 25 collections by Dr. W.L. Gordon. These were identified as follows: Fusarium Poae from 20 collections (130 isolations); F. avenaceum 6 (27); F. graminearum 1 (8); Helminthosporium sativum 11 (44); Alternaria 10 (18); Epicoccum purpurascens 3 (7); a basidiomycete 1 (1); Fusarium Poae predominated in 14 collections, while Helminthosporium sativum was the principal fungus in 7.

ERGOT (Claviceps purpurea) was reported occasionally - slight infection in plots at Lacombe, Alta.; trace at Wawanesa, Man.; trace at Malignant Cove and in plots at Nappan, N.S.

POWDERY MILDEW (Erysiphe graminis) was general in plots at Sidney, B.C., in January and was severe on a few varieties in July. It caused slight to moderate damage in 3 fields at Cloverdale, Matsqui, and Sardis in July. Powdery mildew was slight in two fields in Ont. and it was severe on O.A.C. at Chatterton. The disease was present in most fields in Que., and was frequently heavy on the lower leaves. It was abundant on the lower leaves, especially of certain varieties at Macdonald College. Powdery mildew was recorded from 4 fields in N.S.; it was abundant on lodged grain at Central Argyle. The disease was heavy in a late field of Charlottetown 80 in Queens Co., P.E.I.

BACTERIAL BLIGHT (Phytomonas translucens) was moderate on Alberta No. 8 at Brooks, Alta. (A.W. Henry). A moderate infection was found at Brandon, Man., and a trace at Pigeon Lake out of 14 fields examined. (W.A.F. Hagborg)

SCALD (Rhynchosporium Secalis) was general, infection being slight to severe in the plots at Beaverlodge and Lacombe, Alta.; a trace was present in 3 fields and moderate to severe in 3 others. Scald was reported in 2 fields in Sask.

BLAST (Non-parasitic) was severe in a field at Didsbury, Alta. (G.B. Sanford)

ALKALI INJURY was severe in large patches in a field at Brandon, Man.; the plants were stunted and browned.

RYE

STEM RUST (Puccinia graminis). A trace was found in one field at Dolbeau out of 4 examined in Que.

LEAF RUST (Puccinia secalina). A slight infection was observed in the plots at Lacombe, Alta. A very heavy infection was present on two varieties in the plots at Saskatoon, Sask. Leaf rust was slight also in 2 fields in Sask. and slight to moderate in Quebec.

ERGOT (Claviceps purpurea) was recorded a few times as follows: slight infection in winter rye at Lacombe, Alta.; 10% of heads in a field at Antelope, Sask.; trace to slight infection in 3 out of 4 fields in Que.; trace in a small field in Kings Co., N.S.

POWDERY MILDEW (Erysiphe graminis) was general in a field at Hatzic, B.C.

SPECKLED LEAF BLOTCH (Septoria Secalis). A trace was seen at Saskatoon, Sask.

COMMON ROOT ROT (Helminthosporium sativum and Fusarium spp.) was slight in one field out of 5 examined in Sask.

Phytomonas atrofaciens caused severe leaf infection at Virden and Pipestone, Man., and slight infection at Scarth; no disease was present in 3 other fields. (W.A.F. Hagborg)