I. DISEASES OF CEREAL CROPS

WHEAT

STEM RUST (*Puccinia graminis*). In 1935 Western Canada experienced the severest and most destructive epidemic of stem rust in its history. The rust made its appearance in southern Man. about July 1. Its development and spread was very rapid so that by July 25 stem rust infections on common wheat ranged from 75 to 100% throughout the whole area of Man. south of the Riding Mountains. In this area about 50% of the wheat was not harvested and in some districts in the southwestern part of the province less than 5% of the bread wheat was threshed. In fact the Swan River valley was the only district in Man. where the common wheat was all threshed, although it had been severely affected by rust. In early July, before stem rust was noticeable, it was freely predicted that common wheats in Man. would yield on the average, from 20 to 25 bushels per acre; however, the actual average yield was about 4 bushels per acre.

The 1935 rust epidemic was no more severe than the one experienced in 1916, but the total damage was greater because of the larger acreage affected. The reduction in yield was placed for Man., excluding heat damage in eastern Man., at 20,000,000 bushels and for Sask. at 82,000,000. Based on a price of 80 cents per bushel for No. 1 Northern the monetary loss was $81,600,000. A further loss in grade of 6 cents per bushel on an estimated yield of 48,000,000 bushels from the affected areas amounted to $2,880,000. Thus calculated the total loss was estimated to be approximately $85,000,000. (L.H. Newman)

Reward wheat withstood the attack of rust considerably better than Ceres and Marquis. The rust resistant wheat, Renown, produced at the Dominion Rust Research Laboratory, Winnipeg, Man., was practically rust free and Thatcher, developed at the Minn. Agr. Exp. Sta., St. Paul., was only very lightly rusted. In Man., the yield per acre for Renown and Thatcher under experimental conditions was 24.7 and 28.6 bushels respectively.

Durum wheat, throughout Man., was much less affected by rust than common wheat, the average infection being about 20%. The average yield of durum wheat was at least 13 bushels per acre and most of the crop graded No. 3 or better.

Weather conditions during early spring and summer favoured stem rust development. Seeding began, in general, a few days later than usual. Normal weather conditions prevailed throughout

May, but in June temperatures in Man. were 2 to 5 degrees below normal and the rainfall was 1½ to 3 times in excess of the normal amount. The cool, wet weather during June retarded the development of cereal crops. During July, temperatures were from 4 to 7 degrees above normal and rainfall 1½ to 3 times normal; only in the Swan River valley was the rainfall for July below normal. Spores from the rusted areas in the United States began to arrive in Man. about June 23, and during the last week in June and early July stem rust spores in the air were more prevalent than usual for that time of year.

The factors which were responsible for the unusual severity of the rust epidemic in 1935 were the arrival of abundant inoculum at an early date, the heavy precipitation during June and July, and the retardation of crop development on account of unseasonable weather during the early spring and summer.
(B.Peturson)

Stem rust began to appear on common wheat at Indian Head, Sask., about July 8, after a spore shower on June 29, and it was found at Saskatoon on July 10. It rapidly reached epidemic form and caused severe damage in south-eastern and eastern Sask., especially in zones 1, 2, and 7. Over the rest of Sask. it caused a trace to slight damage before the crop was harvested.

Durum wheat was only lightly infected by stem rust, and it suffered little or no damage.

No stem rust was found in Alta. until August 17, when a few pustules were observed on Gullen at Lethbridge. It was collected in the Edmonton district on August 26 and a slight scattering of rust appeared suddenly in this area on Sept. 1. By this time, however, most of the crop was harvested and no damage was caused. In zones 1-5, 8 and 9 the weather was very dry, while in zones 8-13 the crop was injured by frost.

Stem rust heavily infected wheat at Agassiz, but only slightly at Saanichton, B.C.

Stem rust was more prevalent than usual in the Cereal plots, Ottawa, Ont., due to the cool weather and excessive rainfall of June. A trace was present on July 17, and the following infections were noted on July 30: a club wheat, 40%; Marquis, 30%; a durum wheat, 20%; Huron, 5%. The damage, however, appeared to be slight.

The following extract from a letter written Sept. 2, by Mr. W.R. Reek, Experimental Farm, Ridgetown, Ont., and communicated by Mr. L.H. Newman, indicates that stem rust was destructive to winter wheat in south-western Ontario: "The rust did so much

damage that our entire crop is not fit for seed. Consequently we are purchasing all our own seed wheat and we are forced to cancel the various orders from farmers for seed which amounted to about 600 bushels. The rust did a great deal of damage throughout south-western Ontario, and I anticipate there will be a real scramble for seed about the middle of September".

Stem rust infection was moderate in Que., except at Ste. Anne de la Pocatière, where it caused moderate damage. Stem rust infection was severe on the 73 varieties and strains at Fredericton, N.B.; only the following were slightly infected: Pent. x Ma. 1005, 5%; Pent. x Ma. 1000, 5%; Pent. x Ma. 729, 4%; Thatcher, 3%; 32-6-24-1511, 3%; R.L. 716, 1%. In P.E.I. stem rust appeared early in the season and was very destructive, resulting in much low grade wheat.

LEAF RUST (Puccinia triticina) moderately infected wheat at Agassiz, B.C., while a light infection was reported from Enderby. In Alta. it appeared later than usual and was very scarce, except in one field where a 65% infection was reported. Leaf rust was general but light on common wheat in Man. and in eastern Sask., and the infections were too light to cause appreciable damage. A trace was also reported on durum wheat in Man.

Leaf rust infection ranged from 75-80% on the leaves and up to 25% on the sheaths in the Cereal plots, Ottawa, Ont. The infection ranged from 40-50% at Lennoxville and Macdonald College, Que.; a 100% infection was reported in one field of Red Fife at Ste. Anne de la Pocatière. Leaf rust slightly to heavily infected wheat at Kentville, N.S. It was widespread in P.E.I., infections being from a trace to 100%.

STRIPE RUST (Puccinia glumarum) was common on Vancouver island, B.C. On the varieties at Saanichton infection ranged from 10-60%; damage, a trace to 2%. Egyptian Amber was most seriously affected. Stripe rust was severe only at Lethbridge, Alta., and the damage there was only a trace. Out of 227 fields examined it was noted in 4, one of which was in the Peace River district.

BUNT (Tilletia caries and T. laevis). Besides the field reports, a summary of the data collected from the records of the Western Grain Inspection Division has been kindly supplied by Dr. W.F. Hanna.

Table 1. Wheat Bunt in Western Canada.

Inspection period, August 1 to October 31, 1935

Class of Wheat	Cars Inspected	Cars Graded Smutty	Percentage Smutty
Hard Red Spring	63,360	418	0.6%
Amber Durum	4,945	49	1.0
White Spring	12	2	16.7
Alberta Red Winter	249	98	39.4
All Classes	69,873	569	0.8

If the figures given in Table 1 are compared with those recorded in previous reports (see Ann. Rept. Can. Plant Dis. Survey 14:2-3. 1935) bunt was apparently slightly more prevalent than it has been for the past three years. The most striking increase was in the percentage of cars of Alberta Red Winter which graded smutty in 1935. Usually the figure is slightly more than 10%, but even this, percentage is far higher than that generally recorded for other classes of wheat and suggests that it is more difficult to control bunt in winter wheat in Alberta than in spring-sown varieties.

Usually only a trace of bunt is present in wheat on Vancouver island, B.C., but in one field 50% of the heads were found infected. Bunt (T. caries) was also severe in winter wheat at Armstrong and Enderby in the interior, up to 50% of the plants were found affected. Bunt was found in 16 fields in southern Alta. out of 227 examined, the average damage being 4.0%, while in Sask. bunt was recorded from 3 fields out of 211, with average damage, a trace. Bunt was also reported from all 3 counties of P.E.I.; the damage was a trace to severe.

LOOSE SMUT (Ustilago Tritici) has been found in imported wheat on Vancouver island, B.C., but it seems to disappear after one year; it is believed that conditions are not favourable for smut development. Traces of loose smut were present in 30 fields and infections of 2 and 1% respectively were reported in two others out of 227 fields examined in Alta. It was observed also in 23 fields out of 211 in Sask.; usually only a trace is present, but in one field at Benson, zone 2, 5% of the heads were infected. In Man. loose smut was reported as follows: Marquis, in 5 out of 30 fields, average damage, a trace; Reward, in 18 out of 20, av. damage less than 1%; Ceres, in 21 out of 26, av. damage 1.4%; durum wheat, in 5 out of 46, av. damage, a trace.

Traces to 2% of loose smut were not uncommon in Que.; infections up to 30% were reported from Kamouraska county. Reward 928 contained 1% smutted heads and 20 other varieties showed traces at Fredericton, N.B. Loose smut was found on Marquis, Huron, and other varieties in all 3 counties, P.E.I.; generally damage was light to moderate, but in 10 fields it was severe.

BLACK CHAFF (Pseudomonas (Phytomonas) translucens var. undulosa). One field in zone 10 in Alta. showed 75% infection.

In Man. black chaff was recorded in 19 out of 63 fields examined; the disease was severe on Ceres and Marquis shortly after heading at Virden, Pipestone, and Oak Lake, before rust and drought damage overshadowed it. (W.A.F. Hagborg)

BASAL GLUME BLOTCH (Phytomonas atrofaciens) infected one field severely, 3 slightly, and a trace was present in 97 others out of 227 examined in Alta.; it also infected about 10% of the heads in a field of Marquis wheat at Muenster, Sask.

The disease caused a trace of damage in Man.; it was recorded from 7 fields, but in late July and August rust was so heavy that accurate observations could not be made. (W.A.F. Hagborg)

ERGOT (Claviceps purpurea). Traces were recorded from Chilliwack, B.C.; 4 fields in zones 8 and 10, Sask.; Winnipeg, Man.; Macdonald College, Que.; Queens county, P.E.I.

POWDERY MILDEW (Erysiphe graminis). In general a trace was present at Agassiz and on Vancouver island, B.C., but the variety Hybrid was infected 100%. The disease was also heavy at Lethbridge, Alta., but apparently it caused little damage; a trace was present in 4 other fields.

GLUME BLOTCH (Septoria nodorum). A heavy outbreak, probably causing some damage, occurred in zone 3, Alta., with Nobleford as the centre, where the crop was light and moisture deficient. Traces were recorded in 91 other fields out of 227 examined. A trace was reported in 2 fields in zone 1, Sask., on heads of fallen culms. A trace was also found on Marquis and Early Red Fife in P.E.I.

SPECKLED LEAF BLOTCH (Septoria Tritici) caused slight infections in Saanich county and the Fraser River valley, B.C.

Traces were also recorded from 35 fields in Alta. Leaf spots, caused in part by S. Tritici, were recorded from 39 fields in Sask. and resulted in slight to moderate damage; in one field at Balcarres, the leaves were nearly all infected and dead by August 6.

FOOT ROTS. A trace of Take All (Ophiobolus graminis)was recorded on Vancouver island, B.C.; while other foot rots caused a slight amount of damage.

Take All affected 27 fields out of 227 examined in Alta., and caused an average damage of 3.4%. Foot Rot due to Helminthosporium sativum and Fusarium spp. was reported from 55 fields and caused an average damage of 3.0%; traces were present in 61 other fields.

Take All caused a trace to moderate damage in 6 fields out of 294 examined in Sask.; in one field at Verigin, zone 7, 20% of the plants in a large patch were killed. In southern Sask. Common Foot Rot (Helminthosporium and Fusarium spp.) affected 125 fields out of 129 examined, the average damage being slight. The severity of infection increased only slightly as the crop matured. The disease was reported to have killed 25 to 50% of plants in some fields of durum wheat at Carnduff. In northern Sask. 160 out of 165 fields were found infected; the average damage was slight. The usual increase in severity with the advance of the season was almost absent. Infection ranged from a trace to 80% of the plants, and only a few fields were severely or even moderately infected. A few plants in a plot at Saskatoon and 10% of the plants in a field of durum wheat at Tuxford, Sask. were dead from Pre-Maturity Blight (cause unknown).

A trace of Take All was found at Durban, Man. In 87 fields of common wheat, Common Foot Rot was found in 84, infection was as follows: severe in 18 fields, moderate in 23, light in 24, and a trace in 19. A similar survey of fields of durum wheat showed 40 fields affected out of 43 examined with infection severe in 6 fields, moderate in 22, and light in 12.

BROWNING ROOT ROT (Pythium sp.). A trace was present in one field in zone 8 in Alta.

The disease was widespread in zones 1, 2, 7, 9, and 11 in Sask. for it was noted in 104 out of 196 fields examined. Several fields were severely damaged. In west central Sask. (zones 3 and 9) where drought was severe, the disease was also common and did moderate damage. While browning root rot was moderate in the check plots at Scott, it was progressively less

prevalent with increasing amounts of ammonium phosphate and superphosphate.

HEAD BLIGHT (Fusarium spp.) caused a trace of damage in one field in zone 10, Alta. It was unusually prevalent in the Cereal plots, Ottawa, Ont., probably on account of the hot weather in July following the excessive rain in June. A trace to 1% of the heads had one or more spikelets affected. On Marquis most of the head blight was chiefly due to Fusarium spp., but on some other varieties including those of durum wheat, Helminthosporium sativum caused about half of the blighting; Epicoccum neglectum Desm. was also fruiting on some of the diseased spikelets. Fusarium affected heads were sent to Dr. W.L. Gordon, who found that Fusarium culmorum predominated. No isolations of Gibberella Saubinetii (F. graminearum) were obtained. Traces to slight amounts of head blight were also reported from N.B. and P.E.I. respectively.

SPOT BLOTCH (Helminthosporium sativum) was found in 6 out of 43 fields of durum wheat, and in 8 out of 80 of common wheat examined in Man.; the average damage was slight. A trace was reported from one field in Alta. As noted above H. sativum caused about half the head blight observed at Ottawa, Ont.

ANTHRACNOSE (Colletotrichum graminicola). In the guise of a spikelet blight, a trace was found in one field, in zone 4,Alta.

FALSE BLACK CHAFF (Non-parasitic) was present in moderate amounts in a plot of Reward at Scott, Sask. A similar trouble was observed in Cereal plots at Ottawa, Ont., on Hope x Reward and H. 44 x Marquis crosses and to a less extent on Pentad x Marquis 729.

BRITTLE DWARF (Cause unknown) was present on late tillers around the edges of the plots at the Experimental Station, Swift Current, Sask. Aphids were abundant inside the leaf sheaths of affected tillers.

OATS

STEM RUST (Puccinia graminis) did not become epidemic on oats, but it moderately infected the crop throughout Man. and also in southeastern and east central Sask. The severity of infection in most fields ranged from 10 to 15%, but in some late fields it was as high as 40%. Rust was also observed west of this large area, chiefly in central Sask. None was reported from Alta.

A light infection of stem rust was observed in the Cereal plots, Ottawa, Ont. Similarly traces to light infections were reported from Que., and a field at Kentville, N.S. was lightly infected. Stem rust was prevalent and destructive throughout P.E.I.

CROWN RUST (Puccinia coronata) was prevalent throughout the entire grain growing area of Man. and was particularly severe in the district south of the Riding Mountains. In the more heavily infected fields the severity of infection averaged 70%. Crown rust along with stem rust caused considerable damage to oats. It also caused light to moderate damage in southeastern and east central Sask. In other sections infection was light. Its presence was not reported in Alta.

Crown rust moderately infected oats in the Cereal plots, Ottawa, Ont.; the damage was slight. Rust was frequently reported from Que., but it rarely caused more than a trace to slight damage. Light infections were found in N.S., but it is reported to have caused severe damage in the three counties of P.E.I.

SMUT (Loose Smut, Ustilago Avenae, and Covered Smut, U. Kolleri Wille = U. levis (Kellerm. & Swingle) Magn.) was rather general on Vancouver island and in the Fraser valley, B.C.; infection ranged from 1 to 5%.

A trace of loose smut was found in two fields in Alta., while covered smut caused 4.1% damage in 22 fields out of 103 examined. In Sask. loose smut slightly affected 3 fields out of 48 examined; the same survey revealed usually slight to moderate infection of covered smut in 26 fields, but in one south of Prince Albert 25% of the heads were smutted. In Man. smut was found in 18 out of 36 fields examined; infections varied from 0 to 40% with an average of 5%.

Covered smut infected 25% of the heads in a field at Antrim, Ont.

Covered smut was reported from 20 and loose smut from 60 fields scattered throughout Que.; the average infection was covered smut 10%, loose smut 6%, while the highest infection reported was 50% for covered smut and 41% for loose smut.

Ninety-six collections of oats representing some 15 varieties collected from all parts of the province were sown in plots at Fredericton, N.B. Smut infection in the resulting crop varied from 0 to 20%, with an average infection of 5%.

Covered smut destroyed 20% of the heads in two fields in N.S. The grower of one claimed that he has always treated his seed with uniformly good results with this exception; he asked if covered smut was more difficult to control. Loose smut infections ranging from 2 to 20% were also reported. In some of the smutted fields it was definitely ascertained that the seed had not been treated; on the other hand, no smut was present in fields known to have been sown with treated seed.

Loose smut infections ranged from a trace to 40% throughout P.E.I.; the presence of covered smut was not reported.

HALO BLIGHT (Phytomonas coronafaciens) caused slight damage in 2 fields and a trace of the disease was present in 30 others out of 103 examined in Alta. A trace to moderate damage was caused in 12 fields out of 73 surveyed in Sask. In a plot of Gopher oats at Swift Current 5% of the leaf surface was involved. Halo blight was encountered in Man. as follows: slight in 1 field, moderate in 1 and severe in 3 out of 30 examined.

At Macdonald College, Que., halo blight infections were reported on July 26 as follows: 3% on Banner, 2% on Martin, 1% on Lanark and Mable, trace on Robin and Lasalle, and none on Cartier, Foster, and Acton. A trace was found on Martin at Lennoxville. Traces were also reported in the rod rows at Charlottetown, P.E.I.

STRIPE BLIGHT (Phytomonas striafaciens). Traces were present in 11 fields in zones 8, 10 and 13 in Alta.

FOOT ROTS. A trace of Common Foot Rot (Helminthosporium and Fusarium spp.) was found in 2 fields in zone 2, in Alta. Slight damage was reported in 10 fields in zone 12 and a trace in one in zone 10 due to a foot rot caused by Colletotrichum graminicola.

Common Foot Rot caused a trace to slight damage in 58 fields out of 73 examined in Sask. A trace of Pre-Maturity Blight was also noted in 4 fields. Out of 35 fields surveyed in Man., a trace of Common Foot Rot was found in 22 fields, slight infection in 2, moderate in 3, and heavy in 4.

BROWNING ROOT ROT (Phythium spp.). A trace was found in 2 fields in zone 9, Sask., one on summerfallow at Colonsay and the other on brome land at Guernsey.

LEAF BLOTCH (Helminthosporium Avenae). Traces were found in 8 fields in Alta. Traces to slight infections were reported from Ste. Anne de la Pocatière, Que. and Queens and King counties, P.E.I.

SPECKLED LEAF BLOTCH (Leptosphaeria avenaria (Septoria Avenae) infected 9 varieties as follows: 4% on Acton, 20% on Robin, and 10-15% on the remainder, at Macdonald College, Que. Similar infections were noted at Lennoxville and in one field at Ste. Anne de la Pocatière.

BLAST (Non-parasitic) was found in 61 fields out of 103 surveyed in Alta.; the amount of blast in per cent by zones was: zone 1, 4.3%; zone 2, 7.0%; 3, 4.0%; 4, 3.0%; 5, 5%; 6, 7.2%; 8, 9.3%; 10, 8.2%; 13, 10.0%; an average of 7.5%. While blast was reported from only 26 fields in any quantity out of the 48 examined in Sask., the disease was widespread and severe in some areas, particularly zones 12 and 13, where very dry weather prevailing at heading time may have been a contributing factor. No records of blast were received from Man.

About 5% of spikelets were blasted in a field of Cartier at L'Assomption, Que., and traces were noted in P.E.I.

A BACTERIAL HEAD BLIGHT was severe in both 1934 and 1935 on the variety Nidar in the Cereal plots, Edmonton, Alta. It has been observed to a lesser extent on other varieties and also at Lacombe and Olds. The disease is most striking as the head emerges from the sheath; the upper part of the panicle and sheath are sometimes severely blighted. (A.W. Henry and G. B. Sanford). The disease appears to be of bacterial nature and is not caused by Fusarium spp. as reported last year (Ann. Rept. Can Pl. Dis. Survey 14:12)

ANTHRACNOSE (Colletotrichum graminicola) caused a trace of damage as a leaf spot in zone 9, Sask.

Other LEAF SPOTS (Cause unknown) resulted in a trace to slight damage to 16 fields of oats out of 73 surveyed in Sask.; in one field at Meota, bacterial lesions were found on the flag leaf.

An apparently new LEAF SPOT of fungus origin was destructive in one field of oats in zone 10, Alta.

A disease of oats, which causes the crop to be chlorotic and stunted is generally present throughout the potato growing areas of N.B. Increases up to 20 bushels per acre have resulted from the application of magnesium. (J.L. Howatt and E.M. Taylor)

Frost banding occurred in June in a small field of oats at Fredericton Junction, N.B. Recovery took place in about 10 days. (E.M. Taylor and D.J. MacLeod)

BARLEY

STEM RUST (Puccinia graminis) moderately infected barley in Man. and eastern Sask., but it only caused slight damage as the crop ripened early over most of the area. A trace of rust was noted in one field in Alta.

Stem rust moderately infected barley at Lennoxville, Que.; other observations, mostly earlier in the season revealed traces. In the plots at Fredericton, N.B. rust infection varied from 1-100%; Byng, York, Peatland and O.A.C. 21 showed less than 5%. Light infections were also present throughout P.E.I.

LEAF RUST (Puccinia anomala) slightly infected barley at Saanichton, B.C. and at Minitonas, Winnipeg, Jordan, Brunkild and Oak Bluff, Man. Slight to moderate infections were reported from Macdonald College and Lennoxville, Que.

STRIPE RUST (Puccinia glumarum). A trace was reported from one field in Alta.

COVERED SMUT (Ustilago Hordei) slightly infected barley at Saanichton, B.C. Traces were present in 4 fields in Alta. and recordable percentages in 6 others, the average damage in the latter being 10%. It caused a trace to slight damage in 7 fields out of 28 surveyed in Sask. It was also present in 8 out of 20 fields in Man.; infection varied from a trace to 10% with an average of 1.2%.

Covered smut was reported from 18 fields located at widely scattered points in Que.; infection varied from a trace to 10%, and averaged 3.0%. In 16 collections of barley collected in N.B. and sown in plots at Fredericton, infection varied from a trace to 10%. The average infection of 2.5% was recorded from a survey of 41 fields in P.E.I.

LOOSE SMUT (Ustilago nuda). Traces were reported from 2 fields in Alta., a slight infection in 3 fields in Sask., and in 6 fields in Man.

Dr. W.F. Hanna has also discovered a seedling-infecting loose smut in Man. The smut developed in plants grown in the greenhouse, Winnipeg, in 1935, from seed inoculated with spores collected at Brandon in 1934 for "loose smut". During the past year I have been able to compare the material kindly deposited by Dr. Hanna in the herbarium with a photograph and spores of U. nigra Tapke presented by the author to Dr. Güssow, and also to be shown by Mrs. Nebel at Geneva, N.Y., representative material obtained by her in her studies. Spores in Dr. Hanna's form are

lighter coloured and the surface markings are more pronounced than in Tapke's U. nigra. (Phytopath. 22:870. 1932). If a name must be applied to these intermediate forms between U. Hordei and U. nuda having the appearance of loose smut, with rough spores, but whose spores produce sporidia on germination and are capable of infecting the seedling, I would suggest Ustilago medians Biedenkoff (Zeitschr. f. Pflanzenkr. 4:321. 1894). In fact Dr. Hanna's form closely resembles the published description of U. medians and his material was sent to me under that name. The work begun by Mrs. Nebel (Mabel L. Ruttle, N.Y. (Geneva) Agr. Exp. Sta. Techn. Bull. 221. 1934) should be continued and extended especially to a genetic study of these intermediate forms and crosses between them and U. nuda and U. Hordei.

Loose smut was reported in 39 fields in Que.; infection ranged from a trace to 12%, with an average of 3%. Observations throughout N.B. indicated that infections ranged from a trace to 5%. In P.E.I. the average infection was 12% in 40 fields surveyed.

STRIPE (Helminthosporium gramineum) slightly infected a plot of Colsess barley at Saskatoon, Sask. A trace was observed in 2 fields and on 1% of the plants in a third in Alta.

FALSE STRIPE (Cause unknown) slightly infected 3 fields located at Holland, Beausejour and Oak Bluff, Man.

NET BLOTCH (Pyrenophora teres (Helminthosporium teres) was fairly prevalent on Vancouver island and in the Fraser River valley, B.C., but caused slight damage. Traces were present in 20 fields and a slight infection was seen in 3 others in Alta. out of 37 surveyed. A trace to a slight amount of the disease was found in 5 fields in Sask. It was reported from 21 fields out of 35 surveyed in Man. as follows: light infection in 8 fields, moderate in 4, and heavy in 9.

SPOT BLOTCH (Helminthosporium sativum) was fairly general on Vancouver island and the Fraser River valley, B.C., but infection was slight to moderate. Traces were reported in 11 fields and a slight infection in two others in Alta.

It was found in 11 fields in Man. as follows: light infection in 9 fields, moderate to severe in 2; the average damage was slight.

Barley varieties at Macdonald College and Lennoxville showed slight amounts of spot blotch.

FOOT ROTS. Traces of Common Foot Rot (Helminthosporium and Fusarium spp.) were reported from 3 fields and slight damage was done by it in 5 others in Alta. It caused a trace to slight damage in half the fields surveyed in Sask. It was observed in 24 fields in Man. as follows: infection light in 15, moderate in 5, and heavy in 4.

ERGOT (Claviceps purpurea). A trace was found in a field in Alta., at the Experimental Station, Scott, Sask., at Macdonald College and at two other points in Que., and throughout, P.E.I.

SCALD (Rhynchosporium Secalis) slightly infected barley at Saanichton, B.C. A trace was present in 10 fields and slight infection in one in Alta. It caused a trace to slight damage in 2 fields in Sask.

POWDERY MILDEW (Erysiphe graminis) was moderately severe on most barley varieties in 1935 at Winnipeg, Man. Dr. Margaret Newton has found that some varieties are resistant to powdery mildew or at least to some strains. By this differential reaction she has been able to distinguish physiologic forms within E. graminis DC. f. sp. Hordei.

Powdery mildew infections ranged from 8-35% on barley varieties at Macdonald College and 1-7% at Lennoxville, Que. It was heavy on barley in three fields in Que., in two of which the growth was rank.

BACTERIAL BLIGHT (Phytomonas translucens) was present in one field in zone 13, Alta., and one in Sask.

BROWN STRIPE (Scolecotrichum graminis) moderately infected a plot at Scott, Sask. Leaf spots, of which the cause was undetermined caused moderate damage in 3 fields also in Sask.

RYE

STEM RUST (Puccinia graminis). A trace was noted in one field of fall rye in Sask. and a moderate infection was reported on fall rye from Macdonald College, Que.

LEAF RUST (Puccinia secalina Grove, P. dispersa Erikss. pp). Light infections were reported from Agassiz, B.C.; Beaverlodge, Alta.; at Swift Current and throughout southern Sask.; at Morden, Ste. Agathe, and Winnipeg, Man.; and Macdonald College, Que.

ERGOT (Claviceps purpurea). A trace was found in one field in Sask. and at Starbuck and Birch River, Man. Traces were

present in rye in the Cereal plots, Ottawa, Ont.; Prolific was the heaviest infected. In general, ergot was absent or found in 2 to 5% of the heads in Que., but in one field in Laprairie county ergot was present in 40% of the heads.

POWDERY MILDEW (Erysiphe graminis) moderately infected fall rye at Macdonald College, Que.; it was first observed on May 15.

FOOT ROTS. Common Foot Rot (Helminthosporium and Fusarium spp.) slightly to moderately affected 6 fields out of 8 surveyed in Sask. It also slightly affected 5 fields out of 10 examined in Man.

SPOT BLOTCH (Helminthosporium sativum). A trace was found in a field at Tyndall, Man.

SCALD SPOT (Rhynchosporium Secalis). A trace was observed in zone 10, Alta.

SPECKLED LEAF BLOTCH (Septoria Secalis). A trace to a light infection was found at the Experimental Station, Beaverlodge, Alta., on fall rye.

LEAF SPOTS (Cause undetermined) caused a trace to slight infection in 4 fields out of 8 surveyed in Sask.