I. DISEASES OF CEREAL CROPS

WHEAT

BLACK MOULD (Cladosporium herbarum and Alternaria tenuis).

Affected plants were received from 4 widely scattered places in Sask. (T.C. Vanterpool).

ERGOT (Claviceps purpurea) infection 1-tr. 1-sl./484 fields of spring wheat examined in Alta. (T.R.D.). Ergot infection was usually only tr. in the 14 fields found infected and mostly located in n. and n.e. Sask. Heaviest infections were 10-20% of heads at one end of a field adjacent to brome grass at Kenistino and 5 heads per 15 feet of row at edge of field at Prince Albert (H.W. Mead, T.C. Vanterpool). Ergot was more prevalent than usual in Man.; it was found on wheat, oats, barley, and rye as well as Agropyron spp., brome grass, and timothy (A.M. Brown).

POWDERY MILDEW (Erysiphe graminis) infection was 11-tr. 2-sl. 3-mod./29 fields of winter wheat in s. Alta. (M.N. Grant) and 86-tr. 44-sl. 8-mod./484 fields of spring wheat in Alta. (T.R.D.). Infection was also tr.-sev. on both hard red spring and soft white spring varieties grown under irrigation at the Lethbridge Station (M.N. Grant). A trace was found on winter wheat at Arkell, Ont., on 2 May. A mod. infection was already present in the plots, O.A.C., Guelph on 4 May and the disease was general in the plots by 30 May (J.D. Gilpatrick). Infection was mod. on the lower leaves and culms in a block of Rideau winter wheat at the Central Experimental Farm, Ottawa, on 6 July (V.R. Wallen). Powdery mildew was present on some Ottawa lines at St. Charles de Caplan, Que. (D. Leblond). It was also heavy in the rust nurseries (q.v.) at Kentville and Nappan, N.S.

HEAD BLIGHT (Fusarium spp. and Helminthosporium sativum). Isolations were made from 6 collections of head blight; only odd heads were affected. The organisms isolated from each variety and place were as follows: Man.-Gretna, Redman, F. avenaceum; Morden, durum, and St. Claude, Regent, H. sativum; Solsgirth, Lee, F. culmorum. Ont.- Guelph, Redman, F. avenaceum. N.S.- Kentville, Marquis, F. culmorum (W.L. Gordon). Head blight was severe in an acre plot at Lachevrotiere, Que. (D. Leblond).

COMMON ROOT ROT (Helminthosporium sativum and Fusarium spp.). Infection 5-tr. 17-sl. 5-mod. 1-sev./34 fields of winter wheat and 226-tr. 195 sl. 53-mod. 2-sev./484 fields of spring wheat examined in Alta. Root rot was slightly more sevt in central and n. Alta. than in s. Alta. (T.R.D.).

Data taken from the survey records on common root rot indicate that the level of infection was somewhat lower in wheat in Sask. in 1950 than in the previous year. The mean disease rating for 293 fields of wheat was 11.19. The standard deviation, 6.29, indicates a high degree of variability in the ratings

from individual fields. The coefficients of variability were particularly high in crop districts 2, 7, 5, and 9 and relatively low in districts 8 and 3. The disease ratings for crops districts 1 to 9 were respectively 8.9, 10.6, 17.9, 14.3, 7.6, 10.9, 11.2, 10.6, and 10.0. First estimates of yields in bu. per acre for these districts were respectively 22, 17, 15, 5, 21, 13, 15, 25, and 19. Except for crop district 3, yield shows a good negative correlation with disease ratings (B.J. Sallans).

White heads (less than 1% of the total) were found scattered through a field of Redman at Rosenfeld, Man. The basal parts of the affected plants were severely diseased. Isolation yielded Fusarium graminearum, an organism not previously isolated from cereals affected by root rot in Man. (W.L. Gordon).

A trace of common root rot was present in a block of Rideau winter wheat at the C.E.F., Ottawa, Ont. (V.R. Wallen).

TAKE ALL (Ophiobolus graminis). Infection was 4-tr. 1-sl./34 fields of winter wheat and 38-tr. 10-sl. 3-mod./484 fields of spring wheat examined in Alta. Almost all the diseased fields of spring wheat were found in central and n. Alta. (T.R.D.). Traces of take all were observed in 8 fields out of 293 examined in Sask.; five fields were in e.-central and n.e. Sask., where take all has been known for some time, two in the Battleford area (n.w.) and one at Netherhill (w.-central) (H.W.M.). A mod. infection was observed in 2 fields in e.-central Sask. on 14 Aug., but 4 affected fields were located in the Prince Albert area (n.-central) on 21 Aug., infection being tr.-mod. One field, sl.-mod. infected, near Spruce Home, carried a similarly affected crop in 1949 (T.C. Vanterpool).

BASAL GLUME ROT (Pseudomonas atrofaciens). One case of basal glume rot and one of bacterial black point were seen in Sask. (T.C. Vanterpool).

STRIPE RUST (Puccinia glumarum). A sl. infection was found on winter wheat varieties at Creston, B.C., and a trace on winter wheat near Cardston, Alta. (M.N. Grant).

STEM RUST (Puccinia graminis). For a general account of the rust situation in the Prairies the reader is referred to the special report "Rust Nurseries in Canada in 1950", near the end of this Section.

Stem rust infection was 2-tr. 3-sl./29 fields of winter wheat in s. Alta. Stem rust was first found south of Lethbridge on Karkov on 14 July and in the Brooks area on Elgin on 8 Aug. It was almost impossible to find stem rust on spring wheat in s. Alta., although the artificial inoculation of hybrids grown on irrigated land resulted in mod.-sev. infection. A trace was found near Lethbridge on Lemhi soft spring wheat (M.N. Grant). No stem rust was observed in central and n. Alta. (T.R.D.). Infection was 21-tr. 1-sl. 3-mod./286 fields mostly on durum wheat in s.-central Sask., but a few of the infected fields were Thatcher (H.W.M.).

A light infection of stem rust was observed in a few plots of wheat at O.A.C., Guelph, Ont. (J.D. Gilpatrick). Although stem rust was late in developing, a heavy infection was recorded in some plots of Huron at the Station, Ste. Anne de la Pocatiere, Que. In an experiment to determine the value of dusting wheat with sulphur for the control of rust, no rust was observed in the dusted plots of Huron and Cascade whereas the undusted plots of Huron carried 10% of stem rust and 60% leaf rust and those of Cascade 30% of leaf rust. Significant differences in yield were recorded in favour of dusting with sulphur (A. Payette, F. Gauthier). Only a trace of stem rust was found in one field in Carleton Co., N.B.; 5 counties were surveyed (J.L. Howatt).

LEAF RUST (Puccinia triticina). Infection was 5-tr. 5-sl. 1-mod./29 fields of winter wheat in s. Alta. (M.N. Grant) and 84-tr. 14-sl. 12-mod./484 fields of spring wheat in Alta. (T.R.D.). Leaf rust was first observed on winter wheat south of Lethbridge on 14 July. Traces were general on winter wheat by 24 July when leaf rust was first observed on spring wheat in the same area. By 9 Aug. trace amounts were found in the Brooks area (M.N. Grant). In central and n. Alta. leaf rust was found only in scattered trace amounts (T.R.D.). Infection was 37-tr. 30-sl. 17-mod. 10-sev./286 fields in Sask. Rust was general in n., n.e., e., s.e. and s.-central Sask. and caused considerable damage to late crops (H.W.M.).

Leaf rust mod. infected Cornell 595 in the plots, O.A.C., Guelph, Ont., on 4 May and was general on all winter wheat varieties on 30 May (J.D. Gilpatrick). In a Foundation block of Thatcher at the C.E.F., Ottawa, infection varied from trace to 60% on 31 July (V.R. Wallen). The percentages of leaf rust recorded on the named varieties in the plots at Ste. Anne de la Pocatiere were as follows: Huron 45, Coronation II and Redman 40, Cascade 25 in the main trial; and Cascade and Regent 10, and Lee a trace in the observation plots (A. Payette). See also Rust Nurseries.

BROWNING ROOT ROT (Pythium spp.) was one of the major root-rot diseases in the 1920's and the 1930's, surpassing take all and equalling common root rot in economic importance in most years. Pathologists and farmers alike agree that the disease has been of little or no economic importance in recent years in districts where formerly it caused much concern. This year, browning root rot was reported in 5 fields only in Sask., in which the infection was sl.-mod. Over a score of fields were suspected of having the disease from the brown colour of the lower leaves but showed no root-tip lesioning, so characteristic of browning. What are the reasons for this phenomenal decrease? In early work on the disease, Vanterpool and his coworkers (Can. J. Research C, 13:220-250. 1935; ibid.18:240-257. 1940; and Sci. Agric. 20:735-749. 1940) showed that it could be reduced or prevented by the application of straw, farmyard manure, or phosphatic fertilizers to the soil, and that, of the common wheat varieties, Thatcher showed the most resistance. The evidence available indicates that most factors have operated in recent years in reducing the disease to minor importance. The replacement

of the binder and thresher by the combine has resulted in considerably more straw being returned to the land than formerly when much of it formed straw-piles and was burned or otherwise used. The number of combines in Sask. has increased from 6,000 in 1931 to 42,000 in 1950, a seven-fold increase. The increased use of phosphate fertilizer has been even greater. Whereas the chief fertilizer agency in Sask. sold 700 tons of phosphatic fertilizers in 1932-33, 30,000 tons were sold in 1949-50, a forty-fold increase. Again, Thatcher is now the most commonly grown wheat variety in Sask. These changes appear to be the chief factors in the decrease of browning root rot although the increased use of farm machinery and the employment of certain soil-erosion preventive methods have contributed in certain areas (T.C. Vanterpool).

SPECKLED LEAF BLOTCH (Septoria avenae f. sp. triticea). Infection was 3-tr. 11-sl./34 fields of winter wheat and 196-tr. 112-sl. 6-mod./484 fields of spring wheat examined in Alta. (T.R.D.). See also under Rust Nurseries.

GLUME BLOTCH (Septoria nodorum). Infection was 30-tr. 7-sl. 2-mod. 3-sev./267 fields of spring wheat examined in central and n. Alta. (T.R.D.). The disease was prevalent around Sibbald on Marquis and especially on Thatcher (A.W. Henry). Glume blotch was common on darkened heads of wheat and on leaves (? S. avenae var. triticea). Leaf mortality and shrivelling of grain was severe in many areas (H.W.M.). Affected material was received from Muenster, Nipawin, and Prince Albert (T.C. Vanterpool). Tr.-sev. infections were noted in some fields in York Co., N.B. (J.L. Howatt). A trace was found in a field of late wheat in Queens Co., P.E.I. (R.R. Hurst).

SPECKLED LEAF BLOTCH (Septoria tritici). A trace was observed in 2 fields and in the plots at O.A.C., Guelph, Ont. (J.D. Gilpatrick). See also under Rust Nurseries.

BUNT (Tilletia caries and T. foetida). Data on the prevalence of bunt in Western Canada (Table 1) were obtained from the records of the Board of Grain Commissioners. The percentage of cars graded smutty during the first quarter of the present crop year indicates that the prevalence of bunt has increased slightly in the past two years.

Table 1. Wheat Bunt in Western Canada

Class of Wheat	Aug. 1,1949 to July 31, 1950			Aug. 1 to Oct. 31, 1950		
	Cars Inspected	Cars Graded Smutty	Percentage Graded Smutty	Cars Inspected	Cars Graded Smutty	Percentage Graded Smutty
Hard Red Spring	167,959	286	0.17	37,224	75	0.20
Amber Durum	6,513	54	0.83	2,688	5	0.19
White Spring	667	1	0.15	103	0	0.00
Alberta Red Winter	1,113	50	4.49	350	26	7.43
Garnet	3,072	0	0.00	532	0	0.00
Mixed Wheat	231	2	0.87	63	1	1.59
All Classes	179,555	393	0.22	40,960	107	0.26

Wheat bunt, both common and dwarf, was more prevalent in the North Okanagan area, B.C., than previous years. The winter wheat variety Wasatch has proved resistant for the three years that it has been under trial in the area and is now recommended and licensed for sale (W.R. Foster). Infection was 3-tr. 1-sl./29 fields of winter wheat and 2-tr. 3-mod. 2-sev./212 fields of spring wheat examined in s. Alta. No dwarf bunt was found (M.N. Grant). No bunt was observed in n. and central Alta. (T.R.D.). Bunt was observed in 10 fields out of 286 examined in Sask.; infection was a trace (less than 1%) in 6, sl. (1-4%) in 3 and mod. (5-10%) in one (H.W.M.). A survey of 28 fields in Man. revealed 4% bunt in 2 fields of Thatcher and a trace in one of durum (W.J. Cherewick, W. Popp).

TYPHULA BLIGHT (Typhula sp.) was again severe in Vanderhoof area, B.C. (P.D.S. 29:6) (W.R. Foster).

LOOSE SMUT (Ustilago tritici). Infection was 1-tr. 1-sl./29 fields of winter wheat in s. Alta. (P.M. Halisky) and 7-tr. 1-sl/484 fields of spring wheat in all parts of Alta. (T.R.D.). Out of 286 fields examined in Sask. 2 fields, both of durum wheat, showed a trace and 1% of heads infected (H.W.M.). Out of 28 fields examined in Man. 5 fields showed a trace to 1.5% loose smut (W.J. Cherewick, W. Popp).

BACTERIAL BLACK CHAFF (Xanthomonas translucens). As black chaff, the infection was 10-tr. 1-mod. and as a bacterial leaf blight it was 1-tr. 3-sl. 4-mod./212 fields of spring wheat in s. Alta. The leaf blight infections were found principally in the irrigated area near Brooks (M.N. Grant). The disease was found causing water-soaked lesions on the peduncles of Lee at Brandon, Man.; the organism was isolated and proved pathogenic to seedlings (W.A.F. Hagborg).

BLEACHED HEADS (non-parasitic), characterized by a blighting and bleaching of the heads and of the top third of the plant, began to be observed about the first week of August following high temperatures and hot winds, which prevailed 24-28 July. It was particularly noticeable about Ogema, Milestone, and Mossbank in the south, and Nokomis and Davidson in the central part of Sask. It was severe on durum wheat but relatively slight or absent on bread wheat. M.W. White, Agricultural Representative at Ogema, reported that several hundred acres of durum were affected in his district, in some fields nearly every plant being injured. He observed that some fields sown earlier or later than the damaged ones appeared to be unaffected. Although durum wheats are generally recognized to be more drought resistant than bread wheats, available evidence indicates that there are certain "critical periods" in the growth of the durum plants during which they are more susceptible to atmospheric drought or windburn than bread wheats (O.S. Aamodt and W.H. Johnston. Can. J. Research C, 14:122-152. 1936). The critical periods are the "shooting" and "soft dough" stages. It would appear that those fields showing severe blighting were in the soft dough stage when they were subjected to hot winds in late July, whereas those which largely escaped were in an earlier or later stage of development. Probably another contributing factor was the fact that the plants had not been gradually hardened to the extreme conditions. Of course, any trouble that interferes with efficient water absorption from the soil, such as root rot, will also render the plants more liable to blighting. Although root rot was present, the majority of the injured durum plants were free from disease. The primary cause of the trouble should therefore be attributed to high temperatures and windburn at the critical, early-ripening stage (T.C. Vanterpool).

Several specimens of Pelissier durum wheat were received from the Aneroid-Assiniboia area, Sask. The heads and peduncles had been killed in the flowering stage. The rest of the stem and leaves were normal in growth and colour. The injury is believed to have been caused by unfavourable moisture conditions during a period of hot dry weather at the peak of the plants' water requirements (H.W.M.).

DEEP SEEDING INJURY. Deep seeding combined with a cold spring caused distortion and poor emergence of the seedlings in several fields in Sask. In some instances the surface was difficult to penetrate on account of a crust (T.C. Vanterpool).

FROST. Severe frosts caused widespread damage to cereals in many parts of the Prairie Provinces. As a result, only 50% of the wheat crop is grading No. 1, 2, and 3 Northern instead of 85% of the wheat being in these grades as in a normal year (cf. The Wheat Review. Dom. Bur. Statistics Dec. 1950, p.6). The growing season began with a late cool spring, which delayed seeding. Growth remained slow throughout the summer, the crop being 2 or more weeks late at heading time. In fact the weather was so cool towards the end of the season that the crops failed to colour up normally before the destructive frosts of 16 and 18 August. Seed is of very poor quality, germination being very low particularly in coarse grains (I.L.C.).

HEAD DISCOLORATION or MELANISM (physiological) was prevalent especially in Rescue wheat and mostly in s. Sask. (H.W. Mead, T.C. Vanterpool). Head discolorations, apparently largely physiological in origin, but with the lesions invaded by saprophytes or weak parasites, were widely distributed in s. Man. At Portage la Prairie, severe head discolorations were present on several new varieties in the co-operative test of common wheat varieties. Most severely affected was C.T.713, for which the 5-plot mean rating was 38% compared to 16% for Redman (W.A.F. Hagborg).

HEAT BANDING (high soil surface temperatures). About 50% of the plants were found dying in a low-lying section of a field at Prince Albert on 20 June by Mr. MacKay, Agricultural Representative, and spotting was evident throughout the field. Several cereal crops were found similarly affected at Nipawin by J.B. Durant, Agricultural Representative. A few reports with specimens showing heat damage were also received (T.C. Vanterpool). A specimen was received from Kerrobert. These symptoms developed after a short hot period about 12-13 June. (H.W.M.).

2,4-D INJURY. Cases of head distortion, breaking of peduncles, breaking of culms near base, swelling of the basal node with abnormal development of adventious roots were found or reported from a few places in Sask. These abnormalities appeared to have been caused by 2,4-D. In some cases it was complicated by mechanical injury from tractor wheels or by other causes (T.C. Vanterpool).

OATS

ERGOT (Claviceps purpurea). Trace in a field in Queens Co., P.E.I. (R.R. Hurst).

ANTHRACNOSE (Colletotrichum graminicola). Severely infected plants were received from Nut Mountain, Sask. In 1949 oats yielded 105 bu. per acre in the same field. This year the plants started well but soon deteriorated. A second sample was received from White Fox (H.W.M.). A slight infection was observed on the lower leaves at Weirdale and trace at Star City. In light leaf infections, anthracnose lesions may be confused with aphid injury (T.C. Vanterpool).

POWDERY MILDEW (Erysiphe graminis). A trace was found in one field in s. Alta. (M.N. Grant) and one in central Alta. (A.W. Henry). Trace in a field at Cap St. Ignace, Montmagny Co., Que. (D. Leblond); 5-10% infection at Notre Dame du Lac, Temiscouata Co. (A. Payette). See also Rust Nurseries.

COMMON ROOT ROT (Fusarium spp.). Infection was 45-tr. 15-sl. 2-mod./212 fields in Alta. (T.R.D.). Infection was 2-sl. 9-mod. 3-sev./16 fields examined for root rot in Sask. (H.W.M.).

LEAF BLOTCH (Helminthosporium avenae). Infection was 52-tr. 8-sl. 1-mod./212 fields in Alta., being much more prevalent in s. Alta. than elsewhere (T.R.D.). Infection tr.-mod. in the co-operative oat test plots on irrigated land at Lethbridge (M.N. Grant). Traces in many of the trial plots of the Quebec Seed Board and mod. infection at St. Flavien (D. Leblond); sl. infection in a field at Notre Dame du Lac. (A. Payette). Heavy infection in a field at Woodville, N.S. (C.L. Lockhart). Trace infections were observed in 3 fields around St. John's, Nfld. (G.C. Morgan).

HELMINTHOSPORIUM BLIGHT (H. victoriae). A few plants prematurely blighted were found in the test plot of Garry at Lethbridge, Alta. Over half the isolations from tissue plantings after surface disinfection yielded H. victoriae. This report is believed to be the first of Helminthosporium blight in Alta. (M.N. Grant). The presence of H. victoriae was observed in 13 out of 125 growers' seed samples from the lower St. Lawrence when the seed was given the plate test at Ottawa (D. Leblond).

HALO BLIGHT (Pseudomonas coronafaciens). Trace was seen in one field at Balcarres, Sask., and affected specimens were received from Swift Current (H.W.M.). A slight infection was present on specimens from Archerwill (T.C. Vanterpool). A trace infection was found in a field at Headingly (T. Johnson). Trace infection on volunteer plants in a turnip field in Queens Co., P.E.I. (R.R. Hurst).

CROWN RUST (Puccinia coronata). Infection 13-tr. 2-sl. 1-mod./56 fields mostly in s.-central and s.e. Sask.; this infection was the heaviest for several years (H.W.M.). Infection in the Q.S.B. plots was mod. at Lachevrotière, Que., sl. at Ste. Anne de la Pocatière, tr. at St. Flavien, East Broughton, Frampton, St. Prosper and about Lake St. John and absent below Ste. Anne and in the Gaspé (D. Leblond). Infection varied from 0 to 50% in plots at Ste. Anne (A. Payette). No rust was observed during a survey covering 6 counties in N.B. (J.L. Howatt).

Crown rust appeared very late in the season in trace amounts in N.S.; most fields were entirely free of rust (J.F. Hockey). A 10% infection was recorded on Laurel oats at Charlottetown, P.E.I. (R.B. MacLaren). See also Rust Nurseries.

STEM RUST (Puccinia graminis) was common on Victory oats in the Comox valley, B.C., on 30 Aug.; it caused little damage (W. Jones). A heavy infection developed late in the season at the Ladner Substation (H.N.W. Toms). A light infection was noted on the variety Overland at Creston (P.M. Halisky). Infection was 10-tr. 6-sl. 7-mod. 1-sev./56 fields examined in Sask., nearly all being in the s.-central and s.e. (H.W.M.). A trace was noted in the Q.S.B. plots at Batiscan, Que. (D. Leblond). A 5% infection was noted on Laurel oats at Charlottetown, P.E.I. (R.B. MacLaren). See also Rust Nurseries.

BROWN STRIPE (Scolecotrichum graminis) was severe on a variety from Eastern Canada grown at the station, Lacombe, Alta. (L.E. Tyner).

SPECKLED LEAF BLOTCH (Septoria avenae). Infection was 4-tr. 1-sl./160 fields examined in central and n. Alta. (T.R.D.). The disease was present in Q.S.B. plots at most places in Que. being sev. at St. Charles de Caplan (Gaspe) and mod. in the Lake St. John area (D. Leblond). Speckled leaf blotch was present in the plots at Ste. Anne de la Pocatiere, infection varying from a trace to 40% depending on the variety (A. Payette). Infection was tr.-mod. in some fields in York Co., N.B. (J.L. Howatt).

SMUTS (Loose Smut, Ustilago avenae and Covered Smut, U. kolleri). Smut infection was 17-tr. 12-sl. 2-mod. 3-sev./212 fields examined in Alta. (T.R.D.). Covered smut was found in 33/56 fields examined in Sask.; infection was 21-tr. (less than 1%), 11-sl. (1-4%) and one with 18% of the heads smutted. Loose smut was found also in one field (H.W.M.). Covered smut infections ranged tr.-15% in 3 fields that were found affected 14-15 Aug. (T.C. Vanterpool).

The seedling-infecting smuts of coarse grains were rather scarce this year in the n. part of Man., but they were very prevalent throughout the s. part. This distribution was the reverse of their usual occurrence. Out of 113 fields inspected 35 were free of infection while the other 78 contained a trace to 29% smut, average infection for all fields inspected being 1.7% (W.J. Cherewick, W. Popp).

Covered smut was common in Que. Infection was 1-15% in 73 out of 125 fields examined; in one field at St. Martin de Beauce 25% of the heads were affected. Loose smut was rather rare (D. Leblond). In a field at Notre Dame de Lac, Temiscouata Co., 50% of heads were affected, about half being loose and half covered smut (A. Payette). Smut infection was tr.-12% in fields in York, Carleton, Victoria, Sunbury and Albert Counties, N.B. (J.L. Howatt). Most oat fields showed no smut, but infections up to 17% were seen in Kings and Annapolis Counties, N.S. (J.F. Hockey). No systematic survey was made in P.E.I., but 25% of covered smut was observed in a field

of hullness oats and 5% of loose smut in one of ordinary oats in Queens Co. (D. Robinson, L.C. Callbeck). Out of 40 fields visited in Nfld., infection was sl.-mod. in 5; 4 were in the Avalon peninsula and one in the Burin peninsula. The other 35 fields were practically free of smut. (G.C. Morgan).

BLAST (non-parasitic) was 48-tr. 136-sl. 9-mod. 2-sev./212 fields in Alta.; there was some damage in central and n. Alta. (T.R.D.). Blast was rated 5-tr. 3-sl. 2-mod. 1-sev./56 fields in Sask. The trouble was less prevalent than usual on account of the favourable growing season (H.W.M.). Blast was quite marked, particularly in late-maturing fields everywhere in Que. (D. Leblond).

CHLOROTIC BANDING. On account of high temperature at the soil surface, 60% of the plants were affected in a 2-acre field at Cloverdale, B.C.; the damage was slight as most of the plants recovered in the next 10 days. (cf. T.C. Vanterpool, Sci. Agric. 29(7):334-339. 1949) (I.C. MacSwan). Seedlings showing chlorotic banding and flagging of the terminal parts of the plant at the juncture of the leaves with the stem were received from 3 farmers at Hepburn, Sask., and one at Wolverine. Bright sunshine during a period of high air temperatures (83.5°-89°F.) 10-14 June resulted in high soil temperatures (T.C. Vanterpool). Two cases of chlorotic banding were received, one from Chelan, and one from Maidstone. In the latter case, the seed had been planted very deep ($3\frac{1}{2}$-6 in.) and the seedlings were probably more susceptible to high soil surface temperatures than those from seed planted at the normal depth (H.W.M.). Some leaf banding was observed in 4 acres of oats at upper Falmouth, N.S.; the plants made a satisfactory recovery (J.F. Hockey).

GREY SPECK (manganese deficiency). What appeared to be grey speck caused severe damage in 3 fields west of Sparling, Sask. When oats was grown in soil from these fields, the crop proved very susceptible to root rot caused by Fusarium culmorum, but whether high pH, manganese deficiency, or both, were responsible has not been determined (T.C. Vanterpool). A trace of grey speck was seen in volunteer oats in a turnip field in Queens Co., P.E.I. (R.R. Hurst).

RED LEAF (cause undetermined). A leaf discoloration in cereals, particularly oats, was very pronounced in the summer of 1950. It appeared to be widespread in e. Ont., throughout Que. and in the plots in the Maritime Provinces, particularly at Nappan. (cf. H.H. McKinney. U.S.D.A. Pl. Dis. Reporter 34(5):151-154. 1950) (D.G. Hamilton). Two samples of oat leaves, one showing marked development of pigment and another of normal-appearing leaves, were collected 31 July by D.G. Hamilton and I.L. Conners from plot 50 (oat line 3003-C15) (Chemistry Lab. no. 16961K). The following are the results of an analysis expressed on a dry weight basis:-

	Affected Material	Healthy Material
Nitrogen %	1.92	3.12
Phosphorus %	0.141	0.221
Potassium %	1.77	2.70
Magnesium %	0.115	0.138
Calcium %	0.70	0.47
Manganese p.p.m.	5.8	7.5
Iron p.p.m.	100	100
Zinc p.p.m.	21	17

(F.B. Johnston).

Red leaf was province-wide in N.B., affecting up to 50% of the plants in some fields (J.L. Howatt). Red leaf affected up to 50% of the plants in fields throughout P.E.I.; the disorder was attributed to dry weather in the early part of the growing season by workers of the Winnipeg laboratory to whom specimens were submitted (D. Robinson).

BRANCHING of INFLORESCENCE (2,4-D injury) was noted in a field at Moosomin, Sask.; instead of a single panicle being formed, the inflorescence was borne on 2-4 branches each bearing a small panicle (T.C. Vanterpool).

BARLEY

ERGOT (Claviceps purpurea). Infection was 9-tr./310 fields examined in Alta. (T.R.D.). A fairly general light infection was present in the Tisdale area, Sask., where the acreage of barley is large (H.W.M.). Ergot usually in trace amounts developed late in the season. However one field of Montcalm, foundation seed at Tisdale, became heavily infected; attempts to remove the ergotty heads as they appeared failed and the seed was sold finally as ordinary grain. Source of inoculum was infected grass about 50 yd. distant (T.C. Vanterpool).

POWDERY MILDEW (Erysiphe graminis). Infection was 1-tr. 1-sl./124 fields examined in central and n. Alta. (T.R.D.). Infection was mod. in the Q.S.B. plots at St. Urbain, Ste. Anne de la Pocatière, Notre Dame du Lac, Luceville, and St. Charles de Caplan, Que. (D. Leblond). Only a few varieties, notably O.A.C. 21, were sl.-mod. infected in the plots at Ste. Anne de la Pocatière, Que. Infection was also sl.-mod. in fields along the lower St. Lawrence (A. Payette). Infection was sl. on varieties examined at the Station, Charlottetown, P.E.I. (D.B. Robinson). See also Rust Nurseries.

STRIPE (Helminthosporium gramineum). Infection was 22-tr. 10-sl. 1-mod./310 fields examined in Alta. (T.R.D.).

COMMON ROOT ROT (Helminthosporium sativum and Fusarium spp.). Infection was 46-tr. 19-sl. 2-mod./310 fields examined in Alta. (T.R.D.). In one field examined in the grey soil area 50% of the plants were slightly affected (A.W. Henry). Infection was 4-sl. 31-mod. 9-sev./44 fields examined in Sask. (H.W.M.). In a field sown late with feed barley, cleaned but not treated, in poorly prepared land at Mont Carmel, Que. 50% of the seedlings were affected and 30% were destroyed (R.O. Lachance).

HEAD BLIGHT or DISCOLORATION (Helminthosporium sativum and Fusarium spp.). Odd heads found infected at two places in Man. were collected and isolations made. H. sativum and F. poae were isolated from Montcalm at Clandeboye and Titan at Brandon, and H. sativum only from Dorset at Brandon (W.L. Gordon). Head blight infection was tr.-mod. in 40/129 fields in Alta. Isolations were not made (A.W. Henry). Barley began to show severe discoloration of the head and grain in central, n. central and n.e. Sask. before any frost damage occurred. When the seed was planted H. sativum was the principal fungus isolated and H. teres second (T.C. Vanterpool). Head blight was quite prevalent in the Q.S.B. plots at St. Charles de Caplan, Que., with traces at most other stations (D. Leblond).

SPOT BLOTCH (Helminthosporium sativum). Infection was 30-tr. 10-sl. 2-mod./57 fields examined in s. Alta. (M.N. Grant). Uncommon in central and n. Alta., although a trace was observed in a few fields (A.W. Henry). A trace was recorded in a few fields in n. and w. Sask. (H.W.M.). Infection was heavy in a field at Westbourne, Man., with the 5 bottom leaves dead. A mod. general infection was present in a field at St. Francois-Xavier (G.J. Green). A trace was present on Plush in the Upton plots, Queens Co., P.E.I. (J.E. Campbell).

NET BLOTCH (Helminthosporium teres). Infection was 68-tr. 31-sl. 15-mod. 2-sev./310 fields examined in Alta. Out of 57 fields inspected in s. Alta. only 3 were infected. Infection was tr.-mod. in the plots at Lacombe (T.R.D.). Net blotch was commonly found in central Alta., although not so prevalent as scald; infection varied greatly (A.W. Henry). Net blotch was common in most areas of Sask., especially around Meadow Lake, White Fox, and Tisdale; it caused severe leaf mortality and lesioning of the spikelets. The disease was more common than usual in the University plots especially on barley hybrids (T.C. Vanterpool). A severe general infection was recorded at Letellier, Man. (W.L. Gordon). Leaf spotting, probably mostly net blotch, was slight in the Q.S.B. plots in Lake St. John area with traces at several other places in Que. (D. Leblond).

TAKE ALL (Ophiobolus graminis). Mod. infection in one field in the grey soil area in Alta. (A.W. Henry).

STEM RUST (Puccinia graminis). A field of Titan at Creston, B.C., was sev. infected (M.N. Grant). Infection was very light in 2 fields at Francis in s.e. Sask. (H.W.M.). Only a trace was found in the late-sown varieties in the plots at Ste. Anne de la Pocatière, Que. (A. Payette) and in the Q.S.B. plots in the Lake St. John area (D. Leblond). See also Rust Nurseries.

LEAF RUST (Puccinia hordei) was heavy on some varieties at the substation, Ladner, B.C. (H.N.W. Toms). Infection was mod. on Charlottetown 80; it was not found on varieties commonly grown in Sask. Small amounts of leaf rust occurred on several varieties in the plots at Ste. Anne de la Pocatière, Que. (A. Payette). Infection was light in the Q.S.B. plots at St. Flavien and traces at few other places in Que. (D. Leblond). Infection was a trace in the plots at the Station, Fredericton, N.B. (J.L. Howatt), and sl. on Charlottetown 80 and other varieties at Charlottetown, P.E.I. (R.B. MacLaren). See also Rust Nurseries.

SCALD (Rhyncosporium secalis). Infection was 68-tr. 81-sl. 13-mod. 13-sev./310 fields examined in Alta. Only one infected field was reported in s. Alta. Infection was sl.-sev. in the variety plots at Olds and Lacombe (T.R.D.). Scald was present in most of the 129 fields examined in central Alta.; infection was 0-sev. (A.W. Henry). Scald was common in n. and e. Sask., where a mixed infection of scald and net blotch occurred (H.W.M.). In the few fields observed infection was sl.-very sev. This year was favourable to scald in n.e. Sask. In the plots at the University, Saskatoon, Valentine appeared to be more resistant to scald and more susceptible to net blotch than the other varieties grown (T.C. Vanterpool).

SPECKLED LEAF BLOTCH (Septoria passerinii). Infection was 29-tr. 12-sl./251 fields examined in central and n. Alta. (T.R.D.). Out of 44 fields examined in Man. 8 and 11 Aug., 40 were infected, 15 heavily so. Although the disease was widely distributed throughout the province it was most prevalent and destructive in the n. and w. parts (G.J. Green). Infection was heavy in the Q.S.B. plots in the Lake St. John area, with traces at St. Ambroise and St. Urbain, Que. (D. Leblond). See also Rust Nurseries.

COVERED SMUT (Ustilago hordei). Infection was sl. in the U.B.C. plots at Ladner, B.C. (H.N.W. Toms). Infection was 15-tr. 11-sl. 3-mod. 1-sev./124 fields examined in central and n. Alta. (T.R.D.); and 8-tr. 5-sl. 3-mod. 2-sev./ 57 fields in s. Alta. Most of the latter fields were in the irrigated districts and were sown to Trebi (M.N. Grant). Out of 129 fields visited in central Alta., 27% were affected by covered smut (A.W. Henry). Infection was 15-tr. 6-sl. (1-4%)/47 fields in Sask. (H.W.M.). Only one field of the 100 examined in Man. was free of smut. The other 99 contained 0-35% covered and false loose smuts, average 1.7%, and trace-20% of loose smut, average 3.1% or a combined infection of 4.8% in all the fields of barley examined (W.J. Cherewick, W. Popp). A trace of covered smut was present in several varieties in the plots at Charlottetown, P.E.I. (R.V. Clark).

LOOSE SMUT (Ustilago nuda). Infection was sev. in a field of Sanalta at Salmon Arm, B.C. (G.E. Woolliams). Infection was 32-tr. 25-sl. 4-mod./181 fields examined in Alta. (T.R.D.). In a special survey of 129 fields in central Alta., 41% were infected with true loose smut (U. nuda); no false loose smut (U. nigra) was present (A.W. Henry). Loose smut was found in 17 out of 47 fields visited in Sask. Affected heads suitable for germination tests were obtained from only some fields, but what trials were possible showed that both U. nuda and U. nigra were present. Embryo tests of seed barley produced in 1950 in the experimental plots at Swift Current, Saskatoon, Melfort and Indian Head showed that conditions were relatively favourable for the spread of Ustilago nuda at flowering time. Therefore relatively heavy infections are expected to appear in next year's crop when untreated seed of local origin is sown (R.C. Russell). Loose smut infection was tr.-5% in fields of barley, chiefly Charlottetown 80, in P.E.I. (D. Robinson). In the plots at Charlottetown infection was 2.5% in Ottawa 3092A, 2% in Brandon 112 and Brandon 1136, with lesser amounts in 10 other varieties (R.B. MacLaren). A light infection was found in one field of O.A.C. 21 in the Avalon peninsula, Nfld. (G.C. Morgan).

BACTERIAL BLIGHT (Xanthomonas translucens). Infection was 3-tr. 2-sl./ 57 fields examined in s. Alta. A sev. infection occurred in 3 replications of 55 barley varieties watered by sprinkler irrigation at Lethbridge. Varietal disease ratings ranged from none to severe and were very consistent through the 3 replications (M.N. Grant). Infection was 6-tr./129 fields visited in central Alta. (A.W. Henry). Infection varied from 0 to 60% in variety plots at Ste. Anne de la Pocatière, Que. Some disease could be observed in fields in the district (A. Payette).

BARRENNESS OF HEAD (?frost). Barley heads with many of the lower spikelets blasted but sometimes with the lowermost normal and those immediately above affected were received from the Cariboo district, B.C. Injury probably occurred when the spikelets were still very immature; the stamens were nearly fully grown and the ovary still unfertilized. See Sorauer's Handbuch der Planzenkrankheiten: (Die nicht parasitären und Virus- Krankheiten) vol. 1, pt.1, ed. 6, p.543 (I.L. Conners).

CHLOROTIC BANDING (high soil surface temperature). Samples were received from Chelan, Sask., on 16 June, immediately after a spell of hot weather 12-13 June, which in turn came after continuous cool weather (H.W.M.).

FALSE STRIPE (non-parasitic) was rated 4-tr. 1-sl./57 fields examined in s. Alta. (M.N. Grant).

RYE

ERGOT (Claviceps purpurea). Infection was 3-tr. 3-sl./27 fields in Alta. (T.R.D.). Ergot was found in most fields inspected in Sask. infection being tr.-mod. The disease was sev. in the plots at Saskatoon and Swift Current (H.W. Mead). Five per cent of the heads were affected in a plot at Charlottetown, P.E.I. (J.E. Campbell).

ANTHRACNOSE (Colletotrichum graminicola). J.W. MacRae of the Ont. Department of Agriculture brought in on 14 Sept. a sample of rye seedlings from a 5-acre field at Mountain Station, Ont. The lower leaves were dead and anthracnose and leaf rust were heavy. The farmer stated the crop was a total loss (I.L. Conners).

POWDERY MILDEW (Erysiphe graminis). Infection was 2-tr. 1-sl./27 fields in Alta. (T.R.D.), and heavy in a plot at Charlottetown, P.E.I. (D. Robinson).

COMMON ROOT ROT (Helminthosporium sativum and Fusarium spp.). Infection was 10-tr. 8-sl. 4-mod. 2-sev./27 fields, being more severe in n. and central Alta. than in s. districts (T.R.D.). Of the 8 fields recorded in Sask. the disease rated as mod. in 4, and sev. in 4 (H.W.M.).

STEM RUST (Puccinia graminis). A trace was observed on Prolific at Lethbridge, Alta. (P.M. Halisky). See also Rust Nurseries.

LEAF RUST (Puccinia secalina). Infection was heavy in the moister part of a plot at U.B.C., Vancouver, B.C., on 2 Aug.; leaf rust was also present on fall rye there on 8 Nov. (H.N.W. Toms). Infection 1-tr./10 fields examined in s. Alta. (T.R.D.); heavy on the lower leaves of Horton's Winter Rye in the plots, O.A.C., Guelph, Ont. (J.D. Gilpatrick). Leaf rust was quite widespread and prevalent in N.S. (J.F. Hockey). See Rust Nurseries.

SPECKLED LEAF BLOTCH (Septoria secalis). Infection was 6-tr. 7-sl./27 fields examined in Alta. (T.R.D.).

STEM SMUT (Urocystis occulta). Infection was 2-sl./3 fields examined in southern Alta. (M.N. Grant).

RUST NURSERIES IN CANADA IN 1950

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In Table 2 is shown the incidence of cereal rusts and of a number of other plant diseases on varieties of wheat, oats, barley, and rye grown at 33 places in Canada in 1950. Separate tables were prepared for the rusts and powdery mildew giving the disease intensity on each variety, but the complete report, mimeographed separately in November 1950, must be consulted for this information.

Twelve varieties of wheat, six of oats, five of barley and one of rye were grown. The varieties were: wheat - McMurachy, Lee, Carleton, Little Club, Marquis, Mindum, Thatcher, Yaroslav Emmer, Norka, Redman, Exchange, Frontana; oats - Bond, Trispernia, Ajax, Vanguard, Garry, Clinton; barley - Goldfoil, Peatland, Vantage, H. 106 (Wisconsin), Montcalm; and rye - Prolific.