I. DISEASES OF CEREAL CROPS

WHEAT

ALTERNARIA BLOTCH (A. tenuis) was common in Man. in 1948 but caused slight damage. Two severe outbreaks occurred in very late-sown fields of Regent (W.A.F. Hagborg).

ERGOT (Claviceps purpurea). Traces were recorded in some varieties of winter wheat at Lacombe, in a plot of Marquis at Olds, and in 6 out of 331 fields of spring wheat in Alta. (T.R.D.); in 2 plots of Regent x Thatcher R.L. 2035.4 at Winnipeg, Man. (W.A.F. Hagborg); and in a field in P.E.I. (R.R. Hurst).

POWDERY MILDEW (Erysiphe graminis) infection was 35-tr. 24-sl. 4-mod. /331 spring wheat fields in Alta. and tr.-sl. in the plots at Lacombe, tr.-mod. at Olds and mod. at Edmonton; infection was mod.-sev. in the irrigated plots at Lethbridge and a trace in 4 out of 41 fields of winter wheat in southern Alta. (T.R.D.). Infection slight in a block of Rideau at the C.E.F., Ottawa, Ont. (V.R. Wallen); moderate and less than usual in winter wheat about Guelph (J.D. MacLachlan). A trace in a field in Prince Co., P.E.I. (R.R. Hurst). Compare these local observations with those on the rust nursery material (see Table 2).

HEAD BLIGHT (Fusarium spp.). Continued most and relatively cool weather during the summer appeared to favour the development of head blight in Man. By the end of July, it was found in moist fields of wheat and barley examined and in 15 of the 25 varieties of the co-operative test of wheat varieties at Winnipeg. Occasionally as many as 5% of the spikes were affected. Of the 6 collections of wheat head blight that were cultured, Fusarium Poae was isolated from one collection, F. Scirpi var. acuminatum from 3, F. culmorum from 2, and F. graminearum and Helminthosporium sativum from one.

Gibberella Zeae, the perfect stage of Fusarium graminearum, was found in profusion on corn stubble of the 1947 crop on the University farm by J.E. Machacek on Aug. 8, 1948. (This collection of perithecia was the second recorded for Man., the first having been reported by Dr. G.R. Bisby in 1923). Formation of perithecia evidently took place between mid-June and early August for perithecia were not found on the same stubble on June 12. Empty perithecia, as well as mature and in some collections immature perithecia, were found on the corn stubble at the same location on Sept. 12. No perithecia were found on corn stubble of the 1948 crop when it was examined in mid-November (W.L. Gordon, J.E. Machacek, W.A.F. Hagborg).

Six other collections of head blight on wheat and one on barley from outside Man. were cultured. The species isolated were as follows: Agassiz, B.C., F. avenaceum; Fort William, Ont., F. culmorum; Appleton, wheat 2 collections F. graminearum and barley F. Poae, Helminthosporium sativum; Normandin, Que., F. graminearum (W.L. Gordon).

Traces of head blight occurred in the plots at Ste. Anne de la Pocatiere, Que. (A. Payette).

COMMON ROOT ROT (Helminthosporium sativum and Fusarium spp.). Infection was 79-tr. 100-sl. 18-mod. 4-sev./331 fields of spring wheat in Alta., being slightly more intense in southern than in central Alta.; trace in the plots at Lacombe; 18-tr. 9-sl. 10-mod. 3-sev./41 fields of winter wheat (T.R.D.).

In 1948 the mean disease rating for 245 fields inspected in Sask. was 10.34, compared with 9.80 in 1947 and 10.68 in 1946. The variability from field to field within the province was high (standard deviation 5.48) whereas within a crop district it was, for the most part, lower. The root-rot ratings for crop districts 1 to 9 were respectively 8.1, 6.9, 10.7, 17.8, 7.2, 10.7, 11.2, 10.7 and 9.0. The main difference from last year was the low rating in crop district 2 and the unusually high rating in crop district 4. In fact there appears to have been an increase of the disease in crop district 4 during the succession of dry years from 1943 on, the disease ratings from 1943 to 1948 being 8.5, 11.0, 13.4, 16.7, 12.5 and 17.8. This increase may indicate a build-up of inoculum (B.J. Sallans).

TAKE ALL (Ophiobolus graminis). Infection was 8-tr. 7-sl. 4-mod. 1-sev./41 fields of winter wheat and 23-tr. 13-sl. 2-mod. 1-sev./331 fields of spring wheat in Alta. (T.R.D.). Single plants or small patches were affected in 3 fields in east central Sask.; in one field infection spread from the grassy headland (H.W.M.). Infection was slight and sporadic in winter wheat about Guelph, Ont. (J.D. MacLachlan).

BASAL GLUME ROT (Pseudomonas atrofaciens). A trace was found in one field of spring wheat in Alta. (T.R.D.).

STEM RUST (Puccinia graminis). A trace occurred in one field of winter wheat in 41 examined in Alta. and on most varieties in the plots at Lacombe. A severe infection developed in late-maturing fields of soft wheat at Brooks. Infection was only a trace to slight on spring wheat throughout southern Alta. and a trace at scattered points in central Alta. (T.R.D.). Infection was 10-tr, 2-sl. 3-mod., confined to fields in eastern Sask. from Arcola to Carrot River; it was found at Saskatoon on 10 Aug. on Sea Island and Red Bobs (H.W.M.). For the occurrence of stem rust in Man. as well as Alta. and Sask. consult "Cereal Rust Development in the Prairie Provinces in 1948", on p. 18.

Stem rust infection was slight in winter wheat about Guelph, Ont. (J.D. MacLachlan) and ranged from 20 to 30% in three blocks of Garnet and one of Rideau at the C.E.F., Ottawa (V.R. Wallen). Infection was a trace in a few varieties at Ste. Anne de la Pocatiere, Que. (A. Payette); a trace to slight in all fields examined in N.B. (J.L. Howatt) and a trace in fields in P.E.I. (R.R. Hurst).

LEAF RUST (Puccinia tritioina). A slight infection was noted at Sorrento, B.C. (G.E. Woolliams). Leaf rust was general and often quite heavy throughout the foothills area of north-central Alta. by mid-August. In most fields of winter wheat even slight infections were rare in southern Alta., but infection was moderate to severe in spring wheat. In other parts of central Alta. infection was a trace to slight. "I do not recall a year when leaf rust was more general and heavy in Alta." (G.B. Sanford). Leaf rust infection was 19-tr. 19-sl. 15-mod. 9-sev./247 fields in Sask.; severe infections occurred in the north-east, north-central sections at Weldon, Meath Park, Kelliher and Yorkton. Leaf rust was first recorded at Saskatoon on 27 July (H.W. Mead). The incidence of leaf rust in Man. is recorded in a summary for the Prairie Provinces on p. 18.

Leaf rust infection was in general moderate on winter wheat about Guelph, Ont.; it appeared to be less severe than in 1947 (J.D. MacLachlan). Infection was 40% in a block of Rideau and ranged from 5 to 25% in 3 blocks of Garnet at the C.E.F., Ottawa (V.R. Wallen). In the plots at Ste. Anne de la Pocatiere, Que., infection developed late and ranged from 40-50% on Huron and Coronation to 15-20% on Cascade and Redman (A. Payette). Leaf rust was found in all fields examined in N.B. and caused moderate damage in a few (J.L. Howatt).

BROWNING ROOT ROT (Pythium spp.). No severe outbreaks were observed or reported in Sask. May and, especially, June were much too dry for the disease to develop. When the rains did come in early July the soil temperature was probably too high (T.C. Vanterpool).

BUNT (Tilletia caries and T. foetida). The inspection records (summarized in Table 1) of the Board of Grain Commissioners show that bunt of wheat was less prevalent in 1948 than in the past several years. In Hard Red Spring and Amber Durum wheats there was a marked decrease in the percentage of cars graded smutty, but in Alberta Red Winter the figure remains unchanged (W.J. Cherewick, W. Popp).

Table 1. Wheat Bunt in Western Canada

Class of Wheat	Aug. 1, 1947 to July 31, 1948			Aug. 1 to Oct. 31, 1948		
	Cars Inspected	Cars Graded Smutty	Percentage Graded Smutty	Cars Inspected	Cars Graded Smutty	Percentage Graded Smutty
Hard Red Spring	131,838	418	0.32	45,374	47	0.10
Amber Durum	5,862	90	1.54	4,294	12	0.28
White Spring	433	1	0.23	224	0	0.00
Alberta Red Winter	981	28	2.85	718	28	3.90
Garnet	2,330	0	0.00	402	0	0.00
Mixed Wheat	136	0	0.00	78	1	1.28
All Classes	141,580	537	0.38	51,090	88	0.17

A survey for dwarf bunt of winter wheat in B.C. was made for the first time in 1948 at the request of the Associate Committee on Plant Diseases of the National Research Council of Canada and the Dominion Department of Agriculture. Fields of winter wheat were examined in the Kootenays, Okanagan, Kamloops and the coast, but not in the Cariboo, the only other area in B.C. where winter wheat is grown. Dwarf bunt was found to be well established but not severe at Armstrong and Enderby in the Northern Okanagan. It was also found on one farm on Vancouver Island, but it was not seen in the Kootenay and Kamloops areas. Affected heads were collected from each field and sent to W. Popp, who confirmed the presence of dwarf bunt.

Dwarf bunt infection on the affected farms in the North Okanagan varied from a trace to about 5%. The varieties affected were Hussar, Ridit, Orfed, Jones' Fife, and Yogo, of which Hussar and Ridit are the most commonly grown. The replacing of Jones' Fife with the introduction of Ridit and Hussar in 1931 was very effective in reducing bunt losses until 1945. The

incidence of bunt increased in 1945, 1946, and 1947, but was considerably less in 1948. Dwarf bunt may be responsible for the increased incidence in these years (W.R. Foster). Twenty-two collections of bunt were received at Winnipeg from B.C., Alta. and Sask. The collections were identified as follows: Armstrong, B.C., (10 collections), Enderby (2), all dwarf bunt; Gordon Head, near Victoria (3), one dwarf bunt and two mixed T. caries and T. foetida; Shuswap (1) T. foetida; Lethbridge, Alta., (1) mixed T. foetida and T. caries; Magrath (3), Swift Current, Sask., (1) and Southey (1) all T. foetida (W. Popp).

Bunt infection was 1-tr. 1-sl./41 fields of winter wheat examined in Alta. (L.E. Tyner). About 25% of the heads were bunted in one field, near Whitla, of spring wheat out of 331 fields examined in Alta. (M.W. Cormack). A trace of bunt (mostly T. foetida) was found in 7 out of 251 fields examined in Sask. It was less prevalent in 1948 than for several years. Probably late seeding and the rapid warming of the soil after seeding were responsible for much of the decrease. It is possible that the publicity given to the increase of bunt in recent years resulted in more attention being paid to proper seed treatment (R.C. Russell). No bunt was found in a field survey in Man. (W.J. Cherewick, W. Popp). A trace of bunt (T. foetida) was present in a plot of Huron at Ste. Anne de Pocatiere, Que. (A. Payette).

SPECKLED LEAF BLOTCH (Septoria Avenae var. triticea). Infection was 60-tr. 83-sl. 19-mod. 3-sev./331 fields of spring wheat in Alta., tr.-sl. in the variety plots at Olds and Lacombe and sl.-mod. at Lethbridge (T.R.D.). Infection was 3-mod. 3-sev./247 fields in Sask. The affected fields were in east-central Sask. between Quill Lakes and York; the damage was considerable in late fields (H.W.M.). For additional observations see Table 2.

GLUME BLOTCH (Septoria nodorum). Infection was 11-tr. 9-sl. 1-mod./331 fields of spring wheat in Alta. (T.R.D.). A trace infection was recorded in one field in Queens Co., P.E.I. (R.R. Hurst).

LOOSE SMUT (Ustilago Tritici). Infection was 1-tr./331 fields of spring wheat in Alta. (T.R.D.); 4-tr./251 fields in Sask. (H.W.M.). Infection was a trace in 2 fields and 1.6% in another in the 17 fields of common wheat examined in Man., and a trace to 1.7% av. 0.6%, in the 6 out of 7 fields of durum wheat inspected (W.J. Cherewick, W. Popp). Infection was moderate to severe in susceptible winter wheat varieties about Guelph, Ont.; no loose smut was observed in a block of Cornell 595 at Ont. Agr. College (J.D. MacLachlan). A few affected headswere found in a field in Queens Co., P.E.I. (R.R. Hurst).

BACTERIAL BLACK CHAFF (Xanthomonas translucens) was again severe in Saunders wheat (naturally infected) at Indian Head, Sask. For several years Saunders has been one of the varieties most severely attacked in field test plots inoculated with X. translucens at Winnipeg, Man. The mean annual disease ratings for bacterial black chaff in per cent on four selected varieties for the past three years are given below; each figure is the mean of four replicates:-

Variety	Leaf Area Destroyed 1946	1947	1948	Head Discoloration 1946	1947	1948
Saunders	75	48	66	35	53	28
Thatcher	53	25	53	13	14	9
Apex	46	10	53	26	43	18
Regent	33	10	18	9	16	2

(W.A.F. Hagborg).

CHLOROSIS (physiological). Severe damage was observed in 8 fields of spring wheat and was reported from several others in an area south of Lethbridge and Taber, Alta. This condition apparently developed during a prolonged period of cool, wet, spring weather. It was most severe in the early seedings, but was not constantly associated with a particular variety, soil type or cultural practice (M.W. Cormack).

CHLOROTIC BANDING (high surface-soil temperatures) was widespread in central and north-central Sask., but the damage was probably slight although some retardation of seedling development was reported. In open-air experiments at Saskatoon boxes 12" x 12" x 10" were filled with moist soil to within 1½" of the top, wheat seed was sown and the remaining 1½" filled with dry soil. In four of the eight series that were run, germination was completed during hot clear weather. It was found that chlorotic banding first appeared when surface-soil temperatures registered 42°-45°C, white spot injury increased as the temperature rose to 52°C, while collapse and death of the seedlings occurred at about 52°-54°C. The same three types of symptoms are also commonly found on seedlings which have been subjected to surface-soil temperatures at or near the freezing point. It is planned to incorporate the results of this study in a short paper to Scientific Agriculture (T.C. Vanterpool).

MELANISM (physiological). Head discoloration was reported to be prevalent and severe in a number of fields of Rescue wheat in the Aneroid district, Sask. Specimens of diseased plants were received for examination and in them the discoloration appeared to be very similar to the physiological bronzing that is a normal character in certain wheat varieties. In the specimens, lateral floret development had been arrested in many of the spikelets before kernel development began. In the florets with dwarfed glumes, anthers were present containing pollen grains, but no seed had developed. Anthesis had not occurred in either sterile or fertile florets, the anthers in the fertile florets, being present on the brush of the kernel. Glume and lemma discoloration, chiefly of the exposed surfaces, was common to all florets. The symptoms of disease were not characteristic of Alternaria blotch, bacterial black chaff, or pseudo black chaff and were considered to have resulted primarily from the exceptionally high temperatures (max. 101°F.) that were reached on July 5 and 6 in the Aneroid-Cadillac-Gravelbourg-Chaplin area (W.A.F. Hagborg). Head discoloration was conspicuous about Aug. 1 on Rescue in south and south-east Sask. At Assiniboia and Kindersley root rot was also present (T.C. Vanterpool).

OATS

ERGOT (Claviceps purpurea). Trace infection reported in one field (T.R.D.). Ergots were found by the Seed Laboratory, Saskatoon, in 3 seed samples of Sask. origin (P.M. Simmonds, I.L. Conners).

POWDERY MILDEW (Erysiphe graminis). Infection was general on late sowings in areas in the Fraser River Valley where the ground had been flooded and early growth noticeably retarded (W. Jones).

COMMON ROOT ROT (Fusarium spp.). Infection was 1-sl./113 fields in Alta. (T.R.D.) and 3-sl. 16-mod./19 fields in Sask. (H.W.M.).

LEAF BLOTCH (Helminthosporium Avenae). Infection was 25-tr. 4-sl./113 fields in Alta. (T.R.D.); and slight about Guelph, Ont. (J.D. MacLachlan). Traces, at least, were recorded on all varieties included in the Quebec Seed Board plots located at widely scattered places in Que. The heaviest infection observed was at Notre Dame du Lac and ranged from light to severe (T. Simard, D. Leblond).

HELMINTHOSPORIUM BLIGHT (H. victoriae), as was expected, was more widespread and severe in Man. in 1948 than in 1947 when it was first noticed. The causal fungus had apparently become widely disseminated by wind, and all the fields of Garry oats observed had some of this disease in them although only treated seed had been sown. Blighting was particularly severe where Garry had been sown in or near fields showing infection last year. The amount of infection on the seed of this year's crop is, however, surprisingly low, which may be attributed to the fact that dry weather during late summer and fall prevented the formation of abundant inoculum.

To aid plant breeders in their effort to produce resistant oat varieties, a simple method of soil inoculation was devised. The fungus was grown on ground oat hulls and the inoculum, after grinding, was sown with the seed. The reactions of varieties in the greenhouse and field were found to be very similar (J.E. Machacek).

Helminthosporium blight was moderate to severe in the susceptible varieties, Beacon, Victland and Garry, about Guelph, Ont. (J.D. MacLachlan). A trace was present in a block of Beacon at the C.E.F., Ottawa (V.R. Wallen). It was noted on Beacon and/or Garry in Q.S.B. plots at several places in Que. (T. Simard, D. Leblond).

HALO BLIGHT (Pseudomonas coronafaciens). Infection was 47-tr. 21-sl. 2-mod./113 fields in Alta. and tr.-sl. in the variety plots at Olds and Lacombe (T.R.D.); and 7-sl. 3-mod./57 fields in west-central to east-central Sask. (H.W.M.). A severe infection occurred at Winnipeg, Man. on numerous varieties, both old and new. A severe infection developed on some lines of foundation stock of the variety Exeter, previously considered resistant (W.A.F. Hagborg). A slight infection was observed in a field in Queens Co., P.E.I. (R.R. Hurst).

CROWN RUST (Puccinia coronata). A slight to moderate infection developed in eastern Sask. between Broadview and Tisdale (H.W.M.). Its prevalence in Man. and further eastward is indicated in Table 2.

Infection was slight to moderate about Guelph, Ont. (J.D. MacLachlan). Traces were noted on a block of 3003 whereas a 5% infection was present on Beaver and Beacon at C.E.F., Ottawa (V.R. Wallen). In the Q.S.B. plots at least traces were noted on all varieties, except Mohawk and 3003 (T. Simard, D. Leblond).

In some 30 fields examined in N.B., a trace was found in most early maturing fields, but moderate to severe infections were encountered in some late maturing fields near buckthorns (J.L. Howatt). For several years the Springhill area in York Co. has been under observation on account of the severe infection of crown rust that develops there each year on oats. During the period search has been made for the common buckthorn with limited success. However, observations made this year were successful in locating large hedges and clumps of the alternate host. Plans have now been completed for the removal and destruction of the bushes. When the varieties Erban, Ajax and Vanguard were grown $\frac{1}{4}$ mi. from the nearest buckthorn crown rust infection was 85% on Erban and 95% on the other two (S.F. Clarkson). Crown rust became very abundant on late oats in P.E.I. (R.R. Hurst).

STEM RUST (Puccinia graminis). Infection was 6-tr. 5-sl. 1-mod./113 fields in Alta. and tr.-sl. in the plots at Lethbridge in late August (T.R.D.); and 10-tr. 6-sl. 3-mod. 2-sev. in fields in eastern Sask. (H.W.M.). For its occurrence in Man. and eastward see p. 11.

Infection was sl.-mod. about Guelph, Ont. In Q.S.B. plots at Lennoxville, Que., infection was tr.-mod. on several varieties; stem rust was virtually absent elsewhere (T. Simard, D. Leblond). Stem rust was quite abundant in late fields in P.E.I. (R.R. Hurst).

BROWN STRIPE (Scolecotrichum graminis). Infection slight on a block of Beacon at O.A.C., Guelph, Ont. (J.D. MacLachlan).

SPECKLED LEAF BLOTCH (Septoria Avenae). Infection was 5-tr. 3-sl./113 fields in Alta. and slight in the plots at Lethbridge (T.R.D.). The disease was light to moderate in the Q.S.B. plots at several places in Que.. (T. Simard, D. Leblond). Of the 50 varieties under test at Ste. Anne de la Pocatiere, the heavier infections recorded were: 25% on Erban, 20% on Abegweit and 10-15% on Banner and several lines of 3003 (A. Payette). The observations in Que. are confirmed by the examination of rust nursery material (Table 2).

SMUTS (Loose Smut, Ustilago Avenae, and Covered Smut, U. Kolleri). Covered smut was found in several oat fields about Armstrong, B.C. (G.E. Woolliams). Smut infection was 6-tr. 2-sl./113 fields in Alta. (T.R.D.). Infection was loose smut 3-tr. 1 with 5%, covered smut 24-tr. 14 with 2-25% in 38 fields in Sask.; the latter appeared to be more prevalent than in 1947 (H.W.M.). Out of 163 fields examined in Man., 145 were affected; infection ranged from tr. to 15%, average 1.1% (W.J. Cherewick, W. Popp). Smut infection was sl.-mod. about Guelph, Ont. (J.D. MacLachlan). Loose smut was found in 4 (tr.-1%) and covered smut in 5 (tr.-2%) out of 17 fields examined in York and Sunbury Counties, N.B. (J.L. Howatt). Traces of both smuts found in Prince Co., P.E.I. (D. Robinson).

GREY SPECK (manganese deficiency) was observed in the portion of a block of Beacon that had not been sprayed at O.A.C., Guelph, Ont. (J.D. MacLachlan).

BLAST (non-parasitic) was reported as follows: damage 60-tr. 46-sl. 4-mod. 1-sev./113 fields in Alta. (T.R.D.); damage slight, widespread in Sask., but not severe in any area (H.W.M.); damage tr.-mod. in most varieties in Q.S.B. plots in Que. (T. Simard, D. Leblond). As in 1947 (P.D.S. 27:10) a careful estimate of blast was made in the plots at Ste. Anne de la Pocatiere. The figures for the named varieties included both years were: Beaver 3.6, Mabel 3.2, Roxton 11.1, Ajax 3.8, Banner 14.1, Garry 3.1, and Erban 4.9. In general this year's figures are in good agreement with those of last year (A. Payette). Traces of blast were seen in 15 fields in Queens Co., P.E.I. (R.R. Hurst).

BARLEY

ERGOT (Claviceps purpurea). Infection 10-tr./99 fields in Alta. and in some varieties at Lacombe and Olds (T.R.D.); trace in one field at Percival out of 38 examined in Sask.; also trace at Saskatoon (H.W.M.); infection slight, less than 1947, about Guelph, Ont. (J.D. MacLachlan); trace in a field in Queens Co., P.E.I. (R.R. Hurst).

POWDERY MILDEW (Erysiphe graminis). Infection was moderate in one field near Nipawin, Sask. (H.W.M.); in general moderate about Guelph, Ont., but severe on blocks of O.A.C. 21 and Montcalm (J.D. MacLachlan); moderate on Mensury and O.A.C. 21 and lesser amounts on other varieties in the Q.S.B. plots at Notre Dame du Lac, Que., elsewhere absent to light (T. Simard, D. Leblond); trace in a field in Queens Co., P.E.I. (R.R. Hurst).

HEAD BLIGHT (Fusarium spp. and Helminthosporium sativum). Traces were noted on most varieties in the Q.S.B. plots in Que. (T. Simard, D. Leblond).

STRIPE (Helminthosporium gramineum). Infection was 11-tr. 3-sl. 2-mod./99 fields in Alta. (T.R.D.); and a trace in one field in Queens Co., P.E.I. (R.R. Hurst).

SPOT BLOTCH (Helminthosporium sativium). Infection was 6-tr. 7-sl./99 fields in Alta. and tr.-mod. in variety plots at Lethbridge (T.R.D.). All the leaves of Valentine barley from Wisconsin were affected by spot blotch at the Experimental Farm, Brandon, Man.; infection on other varieties in the plots was not pronounced. The causal organism was isolated (W.E. Sackston). Moderate to heavy infections were recorded on the rust nursery material from several places (Table 2).

COMMON ROOT ROT (Helminthosporium sativum and Fusarium spp.). Infection was 3-tr. 2-sl./99 fields in Alta. (T.R.D.). Of the 35 fields sampled in Sask. 23 were classed as moderately and 12 as severely diseased. In one field at Vonda 100% of the plants were severely lesioned. Disease ratings on barley have been about 40% greater than comparable ratings on wheat in the past 2 years (H.W.M.). Damage was slight to moderate in some plots at the Station, Fredericton, N.B. (J.L. Howatt).

NET BLOTCH (Helminthosporium teres). Infection was 4-tr. 4-sl. 3-mod./99 fields in Alta. (T.R.D.); 3-sl. 4-mod./38 fields located between Broadview and Carrot River in the east part of Sask. (H.W.M.).

STEM RUST (Puccinia graminis). Infection was 4-tr. 3-sl./99 fields in Alta. and trace in variety plots at Lethbridge (T.R.D.). Infection was usually a trace in the few fields in which rust was found in Sask., but it was moderate in the odd field in east central Sask. and slight in a field near Prince Albert (H.W.M.). Infection was moderate about Guelph, Ont. (J.D. MacLachlan). Stem rust was light to moderate on barley in the Q.S.B. plots at Lennoxville, Que.; elsewhere it was rarely more than trace (T. Simard, D. Leblond). Some additional observations are contained in Table 2.

LEAF RUST (Puccinia Hordei) was recorded at 11 stations mostly in eastern Canada and was severe at three (Table 2). Infection was slight to moderate about Guelph, Ont. (J.D. MacLachlan).

SCALD (Rhynchosporium Secalis). Infection was 32-tr. 25-sl. 12-mod./99 fields in Alta., tr.-mod. in the plots at Lethbridge and Olds, and tr.-sev. at Lacombe (T.R.D.). A light infection was present in 2 fields near Scott, Sask., where it has been observed for several years in spite of very dry conditions (H.W.M.).

SPECKLED LEAF BLOTCH (Septoria Passerinii). Infection was 13-tr. 9-sl./99 fields in Alta. and tr. in some varieties at Lacombe (T.R.D.). Its distribution elsewhere in Canada is discussed at some length on p. 11.

SMUT (Covered Smut, Ustilago Hordei, True Loose Smut, U. nuda, and Black Loose Smut, U. nigra). Loose smut was found occasionally in fields in the B.C. Interior (G.E. Woolliams). In the Laboratory survey smut infection was: covered smut:2-tr. 2-sl. 1-mod. 1-sev.; and loose smut 25-tr. 12-sl. 3-mod./99 fields in Alta. (T.R.D.). Either covered smut or true loose smut or both were found during an independent survey in central Alta. in 54% of the 217 fields examined, of which 63 were of smooth-awned varieties, 152 of rough-awned and 2 hooded. The number of fields of each type infected was:-

Type	Covered	Loose	Mixed	Free	Total
Smooth-awned	2	41	16	4	63
Rough-awned	24	23	12	93	152

Covered smut infection varied from a trace to 25% and affected about one field in four of both barley types. Loose smuth was about as prevalent as covered smut in the rough types, but it affected over 90% of smooth-awned barley fields; infection ranged from a trace to 15%. The kind of smut present was checked by spore germination, but no black loose smut was found (A.W. Henry).

Smut infection was: covered smut, 11 fields with trace and 7 with 2-15%, and loose smut, 7 with trace and 6 with 2-4% out of 45 examined in Sask.; average infection covered smut 1.2%, loose smut tr. and slightly less prevalent than in 1947 (H.W.M.). In all, 297 heads of loose smut taken from the plots sown with seed from all parts of Sask. were checked by spore germination; 253 proved to be U. nuda and 44 U. nigra (R.C. Russell). A heavy infection of loose smut was observed at Shell Lake. A sample of seed received from Melfort showed hard smut balls of covered smut scattered through the grain sample. These smut balls were extremely hard and brittle, not unlike ergot bodies in appearance (T.C. Vanterpool). In

Man. smut infection ranged from tr.-48% average 5.2% in the 183 fields examined. Loose smut (U. nuda) was much more prevalent in 1948 than during the past several years (W.J. Cherewick, W. Popp). Loose smut infection was light to moderate about Guelph, Ont. (J.D. MacLachlan). Traces of covered and loose smut were observed in Queens Co., P.E.I. (R.R. Hurst).

BACTERIAL BLIGHT (Xanthomonas translucens). Infection was severe on several varieties of barley in the plots at Winnipeg, Man. The mechanical transfer of inoculum during weeding and loose smut inoculation probably accounted for much of the infection (W.A.F. Hagborg). A 10% infection was observed in Montcalm in the plots at Ste. Anne de la Pocatiere, Que., whereas only traces were seen in the other varieties (A. Payette).

A head blight, characterized by a darkening or browning of the kernels and sometimes portions of the awns, was seen in 7% of the fields visited in Alta. In several fields the kernels were severely blighted and some failed to fill. Smooth-awned varieties appeared especially susceptible, but severe damage occurred in at least one field of rough-awned barley. Bacteria resembling X. translucens were isolated from the diseased kernels (A.W. Henry).

RYE

ERGOT (Claviceps purpurea). Infection was 6-tr. 10-sl. 3-mod./25 fields in Alta. and sl.-mod. in variety plots at Lacombe (T.R.D.). Out of 13 fields examined 6 were affected in Sask., in 2 of which the infection was severe (60-70% of the heads) in the Kandahar area (H.W.M.). A trace of ergot was found in winter rye at Charlottetown, P.E.I. (D. Robinson).

COMMON ROOT ROT (Helminthosporium sativum and Fusarium spp.) infection was 1-tr. 2-sl. 1-mod./25 fields in Alta. and a trace of TAKE ALL (Ophiobolus graminis) in two (T.R.D.). Of the 13 fields examined in Sask., 11 were classed as moderately and 2 as severely diseased (H.W.M.).

STEM RUST (Puccinia graminis). A light infection was noted in 3 fields in Alta. (T.R.D.) and in one field at Ryerson, Sask. (H.W.M.).

LEAF RUST (Puccinia secalina). Infection was 6-sl. 2-mod. 6-sev./25 fields in Alta. (T.R.D.) and present in 3 fields in east-central Sask. (H.W.M.).

SPECKLED LEAF BLOTCH (Septoria Secalis). A trace was observed in 2 fields and a slight infection in a third in Alta. (T.R.D.).