I. DISEASES OF CEREAL CROPS

WHEAT

BLACK MOULD (Cladosporium herbarum and Alternaria tenuis) developed frequently, in late August and September, on standing grain in Sask., where the plants were killed early by common root rot or take all. Not only the heads and culms were attacked, but also broad areas of the leaves in many fields in N.E. Sask. (T.C. Vanterpool).

EYE SPOT (Cercosporella herpotrichoides Fron). A sample of wheat plants supposedly affected by take all from a field of winter wheat in Durham Co., Ont., was received from E.A. Summers, District Representative. It was estimated that 40% of the straws were down and the yield not over 10-15 bu. per acre. Examination revealed no take all or common root rot. The saprophyte, Wojnowicia graminis, not previously reported in Ont., was fruiting on one plant. These findings were afterwards confirmed by P.M. Simmonds. The affected straws did show rather regularly a discoloured and collapsed area in the first internode. The disease was diagnosed as eye spot by Mrs. G. Dion, N.R.C. Regional Laboratory, Saskatoon, formerly with Dr. Mary Glynne, Rothamsted. The fungus was induced to fruit on the affected parts and was subsequently isolated. Eye spot has been considered a disease of considerable importance in England since it was first recognized there in 1935. The present report is the first of its occurrence in Canada (I.L. Conners).

ERGOT (Claviceps purpurea). A trace of ergot was found in a field in east Sask. and in Thatcher seed from south central Sask. (H.W.M.).

ANTHRACNOSE (Colletotrichum graminicola). Infection was light to moderate in 12 fields in S.E. Sask. (H.W.M.).

POWDERY MILDEW (Erysiphe graminis) infection was 3-tr. 3-sl. 1-mod./ 37 fields of winter wheat and 40-tr. 24-sl. 18-mod. 7-sev./ 399 of spring wheat in Alta. Infection was much more severe in southern Alta. than in the central and northern regions (T.R.D.). The disease was particularly severe in the Claresholm area, where the spikes as well as the leaves were attacked (M.N. Grant). Powdery mildew was very light on the 1949 crop of winter wheat in Ont. although infection was mod.-sev. in some O.A.C. plots at Guelph in June. The disease was very prevalent on the newly sown 1950 crop. Samples received from E.A. Summers from Durham Co. were mod.-sev. affected and showed considerable yellowing. He reported that a field of Dawson's Golden Chaff was quite yellow, but that a field of Cornell 595 was unaffected. He found the disease worst in the early-sown fields (J.D. MacLachlan). On the Central Experimental Farm, Ottawa, infection was tr.-sev. (av. mod.) in 5 out of 9 fields examined (V.R. Wallen).

HEAD BLIGHT (Fusarium spp. and Helminthosporium sativum). In 1949, 11 collections of head blight were obtained from B.C., Man., Ont., and Que. Infection was rated a trace. The identity of the organisms present in each collection was determined by the usual cultural methods. The organisms

isolated from each variety and place were: B.C.-Agassiz, Little Club, Fusarium culmorum; Man.-Morden, McMurachy, H. sativum; Ont.-Ottawa, Redman, H. sativum (chiefly) and F. Equiseti; St. Catharines, Thatcher and Redman, F. Equiseti and F. Poae; Williamstown, Hope x Timstein, F. Poae; Que.-Lennoxville, McMurachy, F. Poae; and Normandin, Little Club, McMurachy, and Hope x Timstein, F. avenaceum, Norka, F. graminearum, and Verval, F. graminearum and F. avenaceum (W.L. Gordon).

COMMON ROOT ROT (Helminthosporium sativum and Fusarium spp.). Infection was 121-tr. 140-sl. 53-mod. 4-sev./399 fields of spring wheat and 6-tr. 9-sl. 9-mod. 4 sev./37 of winter wheat in Alta. The disease appeared to be most severe in southern Alta. Infection was tr.-sl. in the variety plots at Lacombe and Olds (T.R.D.). In southern Alta. infection was 11-tr. 5-sl. 1-mod./29 fields of winter wheat seeded in the fall of 1949 (M.N. Grant).

Common root rot appears to have been more prevalent in Sask. in 1949 than in any previous year for which comparable data are available. The mean disease rating for the 245 fields inspected was 13.39 with a standard deviation 5.58. In all nine crop districts the ratings were higher than in 1948 and in the four districts across southern Sask. the figures were up 50-100%. There has been a marked upward trend from the low mean rating of 6.0 in 1942 to the high of this year. The ratings for the crop districts 1 to 9 in 1949 were respectively 12.5, 14.1, 17.5, 19.7, 9.8, 15.9, 13.4, 11.4, and 10.5. As in previous years these ratings show a high negative correlation with the average yield per acre in the various crop districts. The first estimates of the Sask. Secretary of Statistics for crop districts 1 to 9 were 18.1, 10.6, 3.5, 2.9, 22.0, 10.3, 10.3, 26.1, and 18.6 bu. per acre. In some individual fields in the northern areas, particularly about Nipawin, 30-40% of the surface area of the field was affected by the prematurity blight phase of common root rot. Plants from such areas yielded severely shrunken grain (B.J. Sallans).

A survey trip through northern Sask. on 9-10 Aug. revealed that wheat, as well as the odd field of barley present, was suffering from the worst outbreak of root rot ever recorded for this part of the province. Take all, as expected, was worst where two or more consecutive crops of wheat had been grown; in 2 such fields the stunted areas involved 20-25% of the field. Moreover, several fields on new breaking showed a slight, fairly uniform distribution of take all and a moderate amount of root rot of the prematurity type, in which the heads are empty but the stem-bases are only slightly discoloured. Many fields on older land were heavily attacked by common root rot, all plants in large areas being affected. Although little or no external discolouration was evident, the crowns of affected plants were found to be darkened internally when cut open. On incubating, these samples yielded mostly Helminthosporium sativum and occasionally Fusarium spp. In specimens collected on a later trip on 31 Aug.-1 Sept. from many of the same fields the relative frequency of H. sativum and Fusarium spp. was reversed. This result suggests that H. sativum was the primary pathogen. Although moisture was ample, symptoms of root rot appeared during the hot spell, 1-9 Aug., when the maximum daily temperature was 72°-88°F. Except for a severe frost of 12°-16°F. on 24 May,

which killed the early top-growth and caused abnormal tillering of the plants, the season was favourable for plant growth, and with the return of cool, moist weather yields were well above average in spite of damage caused by root rot. While it is true that high soil moisture favours the development of take all, it is generally agreed that on the more open prairie common root rot decreases with increase of soil moisture (P.D.S. 28:2). This outbreak, however, occurred when moisture was above normal. The need for a close study of the ecology of common root rot on the transitional soils of the northern park belt is apparent (T.C. Vanterpool).

The prematurity blight stage of common root rot was general in Man. and caused 2% estimated damage. It was severe in patches in S.W. Man. (J.E. Machacek).

TAKE ALL (Ophiobolus graminis). Infection was 32-tr. 10-sl. 3 mod./399 fields of spring wheat and 2-tr. 4-sl. 1-mod./37 of winter wheat examined in Alta. (T.R.D.). Several fields in the Cowley area were ploughed up in the late spring as a result of severe winter killing and root rot (M.N. Grant).

Several second and third crops of wheat on new land in the Snowden area, west of White Fox, Sask., suffered severely from take all. Elsewhere only trace infections were found (H.W.M.). Infection was slight to severe in the northern park belt of Sask., the disease being severe at Snowden and Smeaton (T.C. Vanterpool). Take all was generally light and occurred sporadically in Ont. (J.D. MacLachlan).

SEED STERILITY (Podosporiella verticillata O'Gara). According to H.A.H. Wallace (Phytopathology 40:30. 1950), this fungus was isolated from 11 samples of seed of common and durum wheat grown in 1946 and 1947 and originating in an area from Assiniboia, Sask., to Edmonton, Alta. In all cases infection was but a trace. The fungus resembles Helminthosporium cyclops Drechsler and the imperfect stage of Pleosphaeria semeniperda Brittlebank & Adam. Naturally infected seed did not germinate. As the author notes, the fungus is apparently new to Canada (I.L.C.). What appears to be the same fungus was isolated from a sample of grain grown near Edmonton (G.B. Sanford).

BASAL GLUME ROT (Pseudomonas atrofaciens). A trace of the disease was seen in 2 fields in S.E. Sask. (H.W. Mead).

STEM RUST (Puccinia graminis). A trace was found on winter wheat in the Raymond area, Alta., on 1 Aug. The only severe infection observed was on a variety of soft wheat near Turin. The first rust on spring wheat was observed on Red Bobs on 5 Aug. at Claresholm. Infection was 3-tr. 5-sl. 4-mod. 1-sev./139 fields in southern Alta. (M.N. Grant). No stem rust was found on wheat in central and northern Alta. in 1949 (T.R.D.). A trace of stem rust was recorded in 15 out of 245 fields examined in Sask. (H.W.M.). In striking contrast to the abundance of leaf rust on wheat in Man., stem rust was virtually absent from the varieties now commonly grown. It was not found until late in July and subsequent infection was light and largely confined to barley (T. Johnson).

According to Peturson (Sci. Agric. 29:230-236, 1949), the present yields of wheat in Man. and eastern Sask. are only possible because rust resistant varieties are grown almost exclusively. Moreover, stem rust of wheat apparently does not now spread as far northward or westward in Western Canada as it did before these varieties were generally grown. The introduction of resistant varieties has not appreciably affected the complex of the physiologic races of wheat stem rust, but has reduced the amount of inoculum. Susceptible varieties, however, are still subject to the rust hazard in spite of the protection afforded by the surrounding acreage of resistant varieties. Because of a definite change in the races of wheat leaf rust, this rust is about as prevalent as ever in the rust area.

Infection was generally light on winter wheat in Ont. A trace was observed in the spring wheat plots at O.A.C., Guelph (J.D. MacLachlan). Stem rust was first observed at Ste. Anne de la Pocatière, Que., on Little Club on 16 July. Later it became heavy on this variety, with traces on other spring wheats (A. Payette). Infection was only a trace in the fields examined in N.B. (J.L. Howatt), and slight on several varieties in the plots at the Station, Charlottetown, P.E.I. (D. Robinson). For additional observations see Rust Nurseries.

LEAF RUST (Puccinia triticina) was first observed in Alta. on Kharkov winter wheat at Lethbridge on 28 July (M.N. Grant). Infection 6-tr. 2-sl./37 fields of winter wheat and 66-tr. 90-sl. 18-mod. 2-sev./ 399 of spring wheat. It was general through southern and central Alta., being slightly more severe in the south. A tr.-mod. infection was present in the plots at Lacombe and Olds (T.R.D.). Leaf rust was more widespread and severe in Sask. than in 1948, being most prevalent in the eastern part. Infection was 24-tr. 21-sl. 9-mod. 30-sev./245 fields (H.W.M.). Leaf rust appeared in southern Man. in early June and thereafter spread quickly throughout the province until, by the end of July, it had reached epidemic proportions. As the infection was rather uniformly heavy from the southern border to the Swan River Valley it is likely that it caused some reduction in the general yield of wheat. Very little difference in varietal reaction was observed between Thatcher and the various Hope and H-44 derivatives (T. Johnson). Leaf rust infection was, in general, slight on the 1949 crop of winter wheat in Ont., but it was very prevalent on the newly-sown 1950 crop. A trace was observed on Cornell 595 in the plots, O.A.C., Guelph, in June (J.D. MacLachlan). Only a light infection was present on 3 fields of Cornell 595 at the C.E.F., Ottawa, on 6 July, whereas powdery mildew was mod.-sev. An even lighter infection occurred in 2 fields of Cascade (V.R. Wallen). Leaf rust heavily infected all varieties in the plots at Ste. Anne de la Pocatière, Que., but it came too late to cause serious damage (A. Payette). In general, leaf rust was heavy on wheat in Queens Co., P.E.I., in August (R.R. Hurst). See also under Rust Nurseries.

SPECKLED LEAF BLOTCH (Septoria Avenae f. sp. triticea). Infection was 1-tr. 2-sl./37 fields of winter wheat and 89-tr. 101-sl. 10-mod./399 of spring wheat examined in Alta. with tr.-mod. amounts in the

plots at Lacombe and Olds. The infection was generally slight in 1949 (T.R.D.). A light infection was widely distributed in Man. (T. Johnson). See also the discussion under Rust Nurseries.

GLUME BLOTCH (Septoria nodorum). A trace was seen in one field of winter wheat and infection was light in one and moderate in a second of spring wheat in Alta. (T.R.D.). The disease was present on 2 lots of wheat heads from Arcola, S.E. Sask.; the heads were mostly empty with a few shrunken kernels (H.W. Mead).

SPECKLED LEAF BLOTCH (Septoria Tritici). Infection was heavy and severe on the lower leaves of winter wheat in the plots, O.A.C., Guelph, Ont., when the crop was examined 5 May. Cornell 595 was highly susceptible. Pycnidia were found in great abundance (J.D. MacLachlan).

BUNT (Tilletia caries and T. foetida). Data obtained from the inspection records of the Board of Grain Commissioners from 1941 to 1949 inclusive indicate that bunt of wheat in Western Canada was less prevalent in 1948 and 1949 than in any previous year with the exception of 1941. The relatively small percentage of cars graded smutty during the first quarter of the present crop year (Table 1) indicates that the prevalence of bunt was not much higher this year than in 1948 (0.17% cars graded smutty for the first quarter, 1948).

Table 1. Wheat Bunt in Western Canada

Class of Wheat	Aug.1,1948 to July 31,1949			Aug. 1 to Oct. 31, 1949		
	Cars Inspected	Cars Graded Smutty	Percentage Graded Smutty	Cars Inspected	Cars Graded Smutty	Percentage Graded Smutty
Hard Red Spring	152,428	194	0.13	60,524	94	0.16
Amber Durum	9,002	18	0.20	3,584	30	0.84
White Spring	598	0	0.00	209	1	0.48
Alberta Red Winter	1,769	83	4.69	585	34	5.81
Garnet	2,666	2	0.08	821	0	0.00
Mixed Wheat	245	2	0.82	97	1	1.03
All Classes	166,708	299	0.18	65,820	160	0.24

Of the 20 collections of wheat bunt received from B.C. 15 proved to be dwarf bunt; however, most of these came from Armstrong. During a survey through the parkland area of Man., Sask. and Alta. to Edmonton and then south to Lethbridge bunt was found in one field in Man. and in several fields in southern Alta. out of 35 examined. In a survey confined to southern Alta., no dwarf bunt was found whereas ordinary bunt was present in 3 out of 139 fields of spring wheat and in 6 out of 8 winter wheat fields (W.J. Cherewick, W. Popp). Bunt was found only in southern Alta. as follows: infection 1-tr. 2-sl. 1-mod./199 fields of spring wheat (T.R.D.)

and 1-tr. 3-sl. 2-mod./25 of winter wheat. Dwarf bunt was not observed (M.N. Grant). Bunt was found in only one field out of 202 examined in Sask., being the least bunt seen for several years. The low infection was probably due mainly to weather conditions (H.W.M.).

Bunt was more prevalent in Ont. than usual and was severe in localized areas. One contributing factor for the increase is the assumption by growers that Cornell 595 is highly resistant not only to loose smut but also to bunt and consequently that seed treatment is unnecessary. One 250-bushel lot of untreated registered Cornell 595 was distributed in the Paincourt-Bearline district, Kent Co. Four fields seeded with about 100 bu. of this lot were surveyed at harvest time, 20 July. Bunt (T. foetida) affected 10-20% of the heads. The stems bearing affected heads were abnormally short; a large majority remained standing after the field was combined (J.D. MacLachlan).

TYPHULA BLIGHT (Typhula sp.). A disease of winter wheat, which resembles Typhula blight, caused severe damage in the Vanderhoof area, B.C. According to A.M. Johnson, District Agriculturalist, 90% of the plants were affected on over 100 acres of one farm. A considerable number of plants were also killed on an additional 400-500 acres in about a 6-mile square. The disease developed under rather special environmental conditions. There was little or no frost in the ground all winter with a good snow cover maintained until mid-April. The blight was confined mainly to the heavier silt and clay soils. Some farmers claim that the disease has occurred before to a lesser extent when it has been confined to shaded locations around bluffs where the snow lies longer than elsewhere in the spring (W.R. Foster).

LOOSE SMUT (Ustilago Tritici) was found in trace amounts only in a few fields in the Prairie Provinces (W.J. Cherewick, W. Popp). Infection was 3-tr. 1-sl./399 fields of spring wheat in Alta. (T.R.D.). A trace only was found in 2 fields in Sask.; the disease was very scarce (H.W.M.). In general loose smut infection was sl.-mod. on susceptible varieties in Ont. Infection ranged from 1-5% in 15 fields around Barrie, 2% in a field at Brantford and 1-5% about Guelph. In one field in Puslinch Twp., Wellington Co., 5-10% of the heads were affected (J.D. MacLachlan). A single sample of loose smut was brought in to the laboratory, Charlottetown, P.E.I. (R.R. Hurst).

BACTERIAL BLACK CHAFF (Xanthomonas translucens). A trace infection was observed in one field in Alta. (A.W. Henry). In southern Alta. the disease developed as a leaf blight of spring wheat to an unusual degree. Infection was 2-tr. 5-sl. 5-mod. 4-sev./139 fields. It was most severe in the Brooks area (M.N. Grant).

OATS

ERGOT (Claviceps purpurea). A trace was present in a seed sample of Garry oats from Zealandia, Sask. (M. Champlin).

ANTHRACNOSE (Colletotrichum graminicola) was observed in six districts of Sask. The lower affected leaves appeared reddish from a distance. Infection was light except at West Humboldt, where it was mod. and damage sl. (T.C. Vanterpool).

COMMON ROOT ROT (Fusarium spp.). Infection was 5-tr. 3-sl. 1-mod. 1-sev./153 fields in Alta. The infected fields were in the Peace River district between Beaverlodge and Dawson Creek, B.C. (T.R.D.). The disease was reported in 9 fields in Sask.; infection was 5-tr. 2-sl. 2-mod. (H.W.M.).

LEAF BLOTCH (Helminthosporium Avenae). Infection was 54-tr. 13-sl. 2-mod./153 fields examined in Alta. (T.R.D.). A trace of infection was observed at Lanigan, Sask.; spores were present (T.C. Vanterpool). Infection was, in general, light in Ont. (J.D. MacLachlan).

HELMINTHOSPORIUM BLIGHT (H. victoriae). A third of the Garry oat plants in a variety test plot at Manor, Sask., were blighted prematurely by July 5. The other varieties were reported free from the trouble. Isolations following disinfection yielded more isolates of Fusarium than H. victoriae. It is suggested that Garry may also be more susceptible to Fusarium root rot than the other commonly grown varieties of oats (T.C. Vanterpool). Blight was prevalent on Garry and Beacon oats in the plots and foundation plantings in Man. Only a light attack developed in fields of these varieties (J.E. Machacek). Blight and root rot was mod.-sev. on the susceptible varieties Beacon, Victland, and Garry, in Ont. (J.D. MacLachlan).

HALO BLIGHT (Pseudomonas coronafaciens). Infection was 82-tr. 36-sl./153 fields examined in Alta. and tr. in all varieties in the plots at Olds and Lacombe (T.R.D.); and 9-sl. 4-mod./63 fields, mostly located in west-central and east-central Sask., where it was about equally prevalent in 1948 (H.W.M.).

CROWN RUST (Puccinia coronata). Infection was 1-tr. 2-sl./63 fields in Sask. being lighter than in 1948 (H.W.M.). Infection by crown rust appeared late and was generally light in Man. (T. Johnson). Crown rust caused, in general, light to moderate infections in Ont. (J.D. MacLachlan). Crown rust was light in Que. (O. Caron). In the fields visited in eastern Que., a light infection on Banner was found only at Sacré Coeur, Rimouski Co. (H. Généreux). Only a trace of crown rust was found in oat fields in York, Sunbury, Kings, Carleton, Victoria, Kent and Westmorland Counties, N.B. (J.L. Howatt). In mid-August some fields were almost free from crown rust in Queens Co., P.E.I., while others showed upwards of 90% infection. The distribution suggested localized sources of infection (D. Robinson).

During a survey made later across P.E.I., crown rust was found everywhere and a few late fields were heavily infected (R.R. Hurst). For further observations see Rust Nurseries.

STEM RUST (Puccinia graminis) appeared late in Man. and infection was generally light (T. Johnson). Stem rust was also light in Ont. (J.D. MacLachlan). In P.E.I., on 15 Aug. stem rust infection varied from a trace to 100% (D. Robinson) and became very heavy in late fields in September (R.R. Hurst). See also Rust Nurseries.

SPECKLED LEAF BLOTCH (Septoria Avenae) was found in Alta. in only 5 fields of 153 examined, infection being 3-tr. 2-sl. (T.R.D.). See also Rust Nurseries.

SMUTS (Loose Smut, Ustilago Avenae and Covered Smut, U. Kolleri). Up to 5% infection of loose smut were found in most oat fields in the northern Okanagan Valley, B.C.; covered smut was also present, but in fewer fields (G.E. Woolliams). Oat smut was recorded in 8 fields in Alta.: 1-tr. 5-sl. 2-mod. (T.R.D.). Covered smut was found in 25 out of 63 fields in Sask.; av. infection 2%, with 20% the maximum.

Loose smut, which is relatively scarce in Sask., was found infecting 3 fields, infection being about 2% in 2 fields and 10% in one. (H.W.M.). Smut infection was generally light in Ont. (J.D. MacLachlan). A trace of loose smut was present in 2 fields of Beaver in Carleton Co., Ont. (V.R. Wallen). Both smuts were found in many fields in York, Carleton and Victoria Counties, N.B., infection being 0-1% (J.L. Howatt). Covered smut was quite general in 6 widely scattered localities visited in P.E.I.; av. infection 2% (D. Robinson).

BLAST (non-parasitic) was 43-tr. 102-sl. 6-mod./153 fields in Alta. and sl.-mod. in the variety plots at Lacombe and Olds (T.R.D.). Damage was 19-tr. 4-sl. 2-mod. 1-sev./63 fields in Sask.; and was less severe than in 1948 (H.W.M.).

GREY SPECK (manganese deficiency) was found in a field of oats west of Spaulding, Sask., on 10 Aug. Oat plants of the variety Exeter grown in the greenhouse in soil from Spaulding developed typical grey speck symptoms, whereas another group of plants so grown but sprayed with manganese sulphate remained unspotted. Several oat fields in the area were affected by grey speck, which was most severe and destructive to oats on new breaking. Successive oat crops after breaking showed less and less of the disease. The disease has been looked for since my coming to Sask. in 1928 and was undoubtedly collected before. However, in previous attempts to prove its existence grey speck failed to develop on plants grown in the soil under greenhouse conditions. It is possible that the oat variety used was unsuitable as varieties vary considerably in their response to manganese deficiency (T.C. Vanterpool). Grey speck caused an estimated 30% loss in yield in a field of Ajax oats at Oak Bank, Man., although this is one of the more resistant varieties. Grey speck was observed at Prawda, the eighth district in which it has been found (W.A.F. Hagborg). Grey speck was observed in 10 fields in Kings and Queens Counties, P.E.I., causing a trace to moderate damage (R.R. Hurst).

BARLEY

ERGOT (Claviceps purpurea). A sample of barley received from Shuswap, B.C., contained about 30% ergot (W.R. Foster). Ergot was very scarce this year, infection being 4-tr. 1-sev./355 fields examined in Alta. (T.R.D.). A heavy infection was also reported in a field at Berwyn, Peace River district (A.W. Henry). A trace was found on Glacier in the plots at Saskatoon, Sask. (H.W.M.). A light infection was found in Ont. (J.D. MacLachlan). A trace was recorded twice in P.E.I. (R.R. Hurst).

POWDERY MILDEW (Erysiphe graminis) was reported as follows: tr.-sl. infection 2 fields in southern Alta. (T.R.D.); heavy infection on several hybrid lines in the Laboratory cereal plots, Winnipeg, Man. (A.M. Brown); moderate infection in Ont., but less than in 1948 owing to adverse weather conditions and on Arion winter barley in the O.A.C. plots in June (J.D. MacLachlan); traces on several varieties sown at Notre Dame du Lac, Témiscouata Co., Que. (A. Payette); and light infection on several varieties in the plots at Charlottetown, P.E.I. (D. Robinson).

HEAD BLIGHT (Fusarium spp.). Two collections of head blight were obtained and the organisms present determined. Infection was heavy in Velvet at Normandin, Que.; 74 kernels from 16 spikes examined: Fusarium avenaceum (28 isolates), F. graminearum (18), F. Poae, F. sambucinum f. 1, F. Scirpi var. acuminatum (1 each). F. Poae was also isolated from a sample from Winnipeg, Man. (W.L. Gordon).

COMMON ROOT ROT (Helminthosporium sativum and Fusarium spp.). Infection was 5-tr. 10-sl. 2-mod. 1-sev./355 fields in Alta. (T.R.D.); and 3-tr. 7-sl. 18-mod. 7-sev./35 fields in Sask. (H.W.M.). Common root rot was severe at Smeaton and very severe in spots in the field at Lac Vert. These outbreaks developed under high moisture conditions. A similar case was reported on barley at Nipawin on 14 Sept. 1945 (P.D.S. 25:13) (T.C. Vanterpool).

SPOT BLOTCH (Helminthosporium sativum). Infection was 3-tr. 6-sl. 2-mod./355 fields in Alta. (T.R.D.). It was common in Man., but was not generally severe (T. Johnson).

NET BLOTCH (Helminthosporium teres). Infection was 22-tr. 15-sl. 2-mod./355 fields in Alta. (T.R.D.); 2-sl. 1-mod. 2-sev. in eastern Sask. and mod. in the plots at Melfort (H.W.M.). Net blotch was the most conspicuous leaf spot of barley in Man. in 1949. It was prevalent throughout the province and considerably more abundant than in the preceding two years.

STEM RUST (Puccinia graminis). A slight infection was noted in one field in southern Alta. (T.R.D.); and a trace was recorded in 2 fields in S.E. Sask. (H.W.M.). A light infection occurred late in the season on barley in Man. (T. Johnson). Infection was in general slight in Ont., but it was moderate in some of the O.A.C. plots (J.D. MacLachlan). Infection

was a trace on most varieties at Notre-Dame du Lac, Que., and slight on the same set at Ste. Anne de la Pocatière (A. Payette). See also Rust Nurseries.

LEAF RUST (Puccinia Hordei). A moderate infection occurred in one field in S.E. Sask. (H.W.M.). Leaf rust was found in south and central Man. but only in trace amounts (T. Johnson). Leaf rust was generally light in Ont., but infection was sl.-mod. on Arion, and tr.-sl. on Wong, winter varieties in the plots, O.A.C., Guelph (J.D. MacLachlan). Leaf rust was tr.-sl. on the varieties at Notre-Dame du Lac and Ste. Anne de la Pocatière, Que. (A. Payette). Leaf rust was light to heavy on Charlottetown 80 and other varieties in P.E.I. (D. Robinson). See also Rust Nurseries.

SCALD (Rhynchosporium Secalis). Infection was 65-tr. 73-sl. 17-mod. 5-sev./355 fields in Alta. and sl.-mod. in the variety plots at Lacombe and Olds (T.R.D.). Infection was light in one field and severe in another at Birch Hills, Sask.; it was also light in the plots at Scott and moderate at Melfort (H.W.M.). Slight infections were recorded at Spruce Home and Pontrilas (T.C. Vanterpool). Some plots at O.A.C., Guelph, Ont., were moderately infected, but the damage was slight (J.D. McLachlan).

SPECKLED LEAF BLOTCH (Septoria Passerinii). Infection was 23-tr. 13-sl. 1-mod./355 fields in Alta. (T.R.D.). The disease was found here and there in Man., mostly as trace or light infections. Only one heavily infected field was recorded. This disease was much less prevalent in 1949 than in the 2 or 3 preceding years probably owing to warm, dry weather, unfavourable to its establishment (T. Johnson). See also Table 3.

COVERED SMUT (Ustilago Hordei) was found in some fields in the north Okanagan Valley, B.C. (G.E. Woolliams). Infection was 39-tr. 16-sl. 3-mod. 3-sev./355 fields in Alta. (T.R.D.); and was 25-tr. 5-sl. 1-mod. 2-sev./190 fields examined during a special survey by the University staff in central Alta. (H.W. Henry). Covered smut was a little less prevalent in Sask. than in 1948; infection was a trace in 6 fields, sl. in 2 and 3-11% in 4 out of 38 examined and averaged 1% (H.W.M.). Infection ranged from tr. to 2% in the fields examined in P.E.I. (R.R. Hurst).

LOOSE SMUT (Ustilago nuda) was present in some fields in the north Okanagan Valley, B.C. (G.E. Woolliams). Loose smut infection was 75-tr. 28-sl. 4-mod./355 fields in Alta. and tr.-sl. in most varieties in the plots at Lacombe. Newall alone was infected at Olds (T.R.D.). During a special smut survey in central Alta. infection by U. nuda was 49-tr. 3-sl. 1-mod./190 fields, being not as severe as in 1945. Titan was moderately infected at Rimbey. U. nigra was found in trace amounts in 2 fields. The identity of the organisms was checked in all cases by a laboratory examination (A.W. Henry). Loose smut was relatively widespread in Sask., being present in 25 of the 38 fields examined. Infection was light, averaging 2%, but the two species were not separated (H.W.M.).

Some 190 fields of barley and oats were inspected during a survey through Man. and across Sask. and Alta. to Edmonton and then south to Lethbridge. The average smut infection was 1.8% in oats and 2.4% in barley, the percentage of infected heads in each crop being very similar in Man. and Sask. and only fractionally less in Alta. However, the prevalence of the different species of smut was significantly different. In Man. the covered and loose smuts of oats were present in approximately equal proportions, while loose smut decreased in prevalence westwards until in Alta. it was very scarce. Similarly the loose and false loose smuts of barley, particularly the latter, decreased in prevalence from Man. to Alta. In Man. about half the barley and oat seed was treated for smut. The effectiveness of the various seed dressings is shown in Table 2. (W.J. Cherewick, W. Popp). The number of seed lots treated with Panogen is too small, but this product appears to be promising. The slightly better results with Ceresan over Leytosan agree with those obtained in controlled experiments (I.L.C.).

Spore-load in seed	Percentage of smut in the field, excluding barley loose smut						
	Untreated (186 fields)	Ceresan (75 fields)	Leytosan (60 fields)	Formald. (39 fields)	Panogen (10 fields)	Bluestone (4 fields)	Mean
Trace	0.43	0.08	0.09	0.32	nil	nil	0.26
L to H	1.94	0.41	0.53	1.78	tr. 1/	1.17	1.34
Mean	1.57	0.30	0.39	1.20	tr	0.88	1.04

1/ Only one field contained a trace of smut.

Loose smut was generally light to moderate in Ont. (J.D. MacLachlan). It affected 6% of the heads in a field of O.A.C. 21 at Kapuskasing (V.R. Wallen). Traces of both loose and covered smut were found in many fields in York, Sunbury, Victoria, Albert and Carleton Counties, N.B. In one field in Carleton Co., 60% of the heads were affected by covered smut (J.L. Howatt).

BACTERIAL BLIGHT (Xanthomonas translucens) was unusually prevalent in Alta. in 1949. Infection was 52-tr. 36-sl. 5-mod. 1-sev./355 fields inspected (T.R.D.) and sl.-mod. in the variety plots at Lethbridge (M.N. Grant). In the seed drill sample plots at Edmonton, infection was tr.-mod. in 237/364 samples. This infection became noticeable about 2 weeks after a very heavy rain in mid-July (A.W. Henry). Traces were observed on several varieties sown at Notre-Dame du Lac, Que. (A. Payette).

HEAD BLIGHT (?bacteria). Infection was 8-tr. 8-sl. 2-sev./190 fields in central Alta. (A.W. Henry).

RYE

ERGOT (Claviceps purpurea) infection was as follows: 8-tr. 2-sl. 1-mod./26 fields in Alta. and tr. in the plots at Lethbridge and Olds, being unusually scarce in Alta. this year (T.R.D.); trace in one field at Touchwood, Sask. and in the plots at Melfort (H.W. Mead); over 10% of the heads were affected in a field near Codette and although ergot was rare in 1949, this field was the most heavily infected seen for a long time (T.C. Vanterpool); heavy on fall rye, variety Rosen, at Winnipeg, but absent in adjacent plots of spring rye--apparently the flowering period of the spring rye did not coincide with the ascospore shower (A.M. Brown); trace only in Queens Co., P.E.I. (R.R. Hurst).

COMMON ROOT ROT (Helminthosporium sativum and Fusarium spp.). Infection was 1-tr. 2-sl. 1-mod. 1-sev./26 fields in Alta. (T.R.D.); and 1-tr. 2-sl. 1-mod./6 fields in Sask. (H.W.M.).

TAKE ALL (Ophiobolus graminis). A trace was found in 2/26 fields in Alta. (T.R.D.).

STEM RUST (Puccinia graminis). A trace was present in one field at Touchwood, Sask. (H.W.M.).

LEAF RUST (Puccinia secalina) was severe in one field at Touchwood, Sask. (H.W.M.). A light infection was noted at East Baintree, Man, (W.A.F. Hagborg).

SPECKLED LEAF BLOTCH (Septoria Secalis). Infection was 4-tr. 1-sl./26 fields in Alta. (T.R.D.).

BACTERIAL BLIGHT (Xanthomonas translucens). A slight infection was observed at La Rochelle and Winnipeg, Man. (W.A.F. Hagborg).

RUST NURSERIES IN CANADA IN 1949

T. Johnson, B. Peturson, A.M. Brown and G.J. Green

In Table 3 is shown the incidence of the cereal rusts and of certain other plant diseases on wheat, oat, and barley varieties grown in the rust nursery plots at 31 places across Canada in 1949. Separate tables were prepared for the cereal rusts and powdery mildew of wheat giving the disease intensity on each variety in the plots, but the complete report, mimeographed separately, must be consulted for these details.

Twelve varieties of wheat, six of oats, and four of barley were grown. The varieties were: wheat - McMurachy, Hope x Timstein R.L. 2477, Carleton, Little Club, Marquis, Spellmar, Thatcher, Vernal, Norka, Redman,