# I. DISEASES OF CEREAL CROPS

## WHEAT

ERGOT (Claviceps purpurea) infection was 27-tr./484 fields of spring wheat in Alta. (P. M. H., T. R. D.); a mod. infection was noted in a field at Winterburn, w. of Edmonton (A. W. Henry). Ergot was observed or reported from four places in Sask.; the disease was heavy at Unity. Many agriculturalists believe that ergot on wheat is increasing (T. C. Vanterpool). A trace of ergot was recorded in R. L. 2622 in the plots at Ste. Anne de la Pocatiere, Que. (L. J. Coulombe). Up to 1% of the heads were infected by ergot in a field of Cascade at Andover, N. B. Couch grass growing at the edges of the field as well as some plants in the field were also infected. Examination of rodrow trials of spring wheat at Jacksonville, near Woodstock, revealed up to 2% of heads of Cascade affected by ergot while Huron, Redman, Coronation and Acadia were free of ergot (S. F. Clarkson).

POWDERY MILDEW (Erysiphe graminis). Infection was 11-tr. 1-sl./30 fields of winter wheat in s. Alta. and 38-tr. 8-sl. 6-mod./484 fields of spring wheat in Alta. Powdery mildew was much more prevalent in southern than in central and n. Alta. (P. M. H., T. R. D.). Powdery mildew was observed only once in Sask., when a mod. infection was seen in a seed plot at Tisdale in late July (H. W. M.). A sl. infection was observed on Kharkov at Saskatoon, where I do not recall seeing powdery mildew on wheat before. The disease was common on several varieties of wheat and barley at Kylemore according to F. J. Greaney and D. McLean (T. C. Vanterpool). See also under Rust Nurseries.

HEAD BLIGHT (Fusarium spp.). In the 4 samples examined, only a few spikelets were infected in each; the following species of Fusarium were isolated: Elie, Man., durum wheat - F. culmorum; Pilot Mound, Man., common wheat - F. culmorum; Fredericton, N. B., Little Club - F. avenaceum; and Charlottetown, P. E. I., Marquis - F. poae and F. avenaceum (W. L. Gordon). Traces of head blight were observed in the plots at Ste. Anne de la Pocatiere, Que. (L. J. Coulombe).

COMMON ROOT ROT (Helminthosporium sativum and Fusarium spp.). Infection was 2-tr. 2-sl./30 fields of winter wheat in s. Alta., and 142-tr. 189-sl. 49-mod. 6-sev./484 fields of spring wheat in Alta. (P. M. H., T. R. D.). Common root rot was mod. to sev. in one replicate in a yield test of a Rescue x Golden Ball hybrid at Lethbridge. The disease was most pronounced in late-emerging plants (M. N. Grant).

Common root rot in wheat was less severe in Sask. in 1952 than in any year since 1942. The mean disease rating for 126 fields was 7.46 compared with 13.66 for 1951. Though data on actual losses in yield are not available, it is believed that the lesions on the roots had little effect on yield this year, when the temperature conditions were equable and moisture reserves in the soil were abundant. The crop was exposed to no adverse conditions except in a relatively small portion in the Saskatoon--North Battleford areas. Disease ratings for crop districts 1-6 and 9 respectively were 6.7, 4.3, 9.2, 9.3, 6.1, 8.0, and 10.6. Ratings for districts 7 and 8 were not available. Preliminary

estimates of wheat yields for the 9 crop districts were: 21.0, 26.3, 24.2, 24.3, 26.2, 24.8, 27.9, 26.1, and 27.1 bushels per acre.

A survey was also made in the three Prairie Provinces on the occurrence of common root rot in wheat. Two sets of data were taken in the field, (a) percentages of plants with severe lesions on the subcrown internodes, and (b) percentages of plants with lesions at or just above the crown. The former percentages were converted to disease ratings on the basis of laboratory examination of samples from every fourth field. The ratings normally give some indication of the reduction of yield caused by common root rot, but the yield appears to have been little affected this year because most of the crop was not subjected to adverse growing conditions.

Table 1. Disease ratings on subcrown internodes and percentages of plants with crown lesions compiled according to province and soil zone.

| | | Soil Zones | | | | Provincial totals or means |
|---|---|---|---|---|---|---|
| | | Brown | Dark Brown | Black | Grey | |
| Alta. | No. of fields | 9 | 18 | 40 | 5 | 72 |
| | Disease rating | 9.0 | 7.5 | 5.5 | 5.2 | 6.4 |
| | Crown lesions | 32.8 | 42.8 | 31.0 | 23.0 | 33.6 |
| Sask. | No. of fields | 23 | 58 | 45 | 0 | 126 |
| | Disease rating | 9.2 | 6.7 | 7.6 | -- | 7.5 |
| | Crown lesions | 32.8 | 39.7 | 35.6 | -- | 37.0 |
| Man. | No. of fields | 0 | 0 | 51 | 0 | 51 |
| | Disease rating | -- | -- | 6.8 | -- | 6.8 |
| | Crown lesions | -- | -- | 35.4 | -- | 35.4 |
| All Provinces | No. of fields | 32 | 76 | 136 | 5 | 249 |
| | Disease ratings | 9.2 | 6.9 | 6.7 | 5.2 | 7.2 |
| | Crown lesions | 32.8 | 40.4 | 34.2 | 23.0 | 35.7 |

The disease ratings do not differ greatly from province to province and are influenced to a considerable degree by the proportions of the various soil types in each province (Table 1). The brown soil zone in s.w. Sask. and s.e. Alta. with an average disease rating of 9.2, was the most severely affected. The dark soil zone, which is largely confined to Alta. and Sask., shows a similar amount of disease to that found in the black soil zone, which extends across all three provinces. The grey soil zone was entered only briefly in Alta. and the 5 fields visited are insufficient for drawing conclusions. In Table 2, the disease rating was 7.2 in crops on fallow land compared with a rating of 6.3 on stubble; the difference in the ratings was consistent for the various soil zones. (B. J. Sallans).

Table 2. Disease ratings on subcrown internodes and percentages of plants with crown lesions compiled according to crop sequence and soil zone.

| Place in rotation | | Soil Zone: Brown | Dark Brown | Black | Grey | Totals or means |
|---|---|---|---|---|---|---|
| Fallow | No. of fields | 18 | 59 | 112 | 3 | 192 |
| | Disease rating | 9.7 | 7.1 | 6.9 | 7.1 | 7.2 |
| | Crown lesions | 34.2 | 40.9 | 34.4 | 18.3 | 36.1 |
| Stubble | No. of fields | 14 | 17 | 24 | 2 | 57 |
| | Disease rating | 8.4 | 6.0 | 5.5 | 2.5 | 6.3 |
| | Crown lesions | 31.1 | 38.5 | 32.9 | 30.0 | 34.0 |

TAKE-ALL (Ophiobolus graminis) infection was 2-tr. 4-sl./30 fields of winter wheat in s. Alta. The disease was generally distributed through the winter wheat plots at Creston, B.C. (P.M. Halisky). Infection was 47-tr. 52-sl. 22-mod. 5-sev./484 fields of spring wheat examined in Alta. Take-all was unusually prevalent in 1952. In one sev. affected field of Canus at Nobleford, the damage was more pronounced in a third-year continuous wheat crop than in an adjacent second-year crop. (P.M.H., T.R.D.). The disease was more prevalent than usual in central Alta. Fields at Lacombe, Didsbury, and Blackie were sev. damaged. It was reported as far north as Hines Creek. The fungus fruited more commonly than usual (A.W. Henry).

Take-all was more prevalent and severe than usual, being present in s.e. and n.w. Sask. and on the Regina plains. It was reported in 17 out of 126 fields examined. Individual fields at Whitewood, Delmas, and Highgate showed 30, 15, and 10% of the plants diseased (H.W.M.). Take-all was present in a large number of fields and is still a problem in areas where a strict rotation is not followed (T.C. Vanterpool).

BASAL GLUME ROT (Pseudomonas atrofaciens). Trace infections were observed in two fields at Wellwyn and Hirsch in s.e. Sask. (H.W.M.). A sl. infection was observed in several localities in Man.; pathogenic isolates 4023 and 4063 were obtained (W.A.F. Hagborg).

STRIPE RUST (Puccinia glumarum). Infection was 1-tr. 2-mod./30 fields of winter wheat and 2-tr. 2-mod. 1-sev./124 fields of spring wheat in s. Alta. Stripe rust was prevalent on winter wheat in the Creston valley, B.C., in mid-July. By early August a mod. infection developed on some of the soft-wheat hybrids at Lethbridge, Alta. (P.M. Halisky). Stripe rust was not observed elsewhere in Alta. (T.R.D.). See also under Rust Nurseries.

STEM RUST (Puccinia graminis). Infection was 1-tr. 1-mod./30 fields of winter wheat observed in s. Alta. It was first observed on Kharkov and

Jones Fife in the Lethbridge plots on 5 August (J. E. Andrews). Infection was 17-tr. 4-sl. 4-mod. 1-sev./124 fields of spring wheat examined in s. Alta. Stem rust was generally distributed throughout s. e. Alta. It was prevalent in irrigated fields and caused sev. damage to a few late stands of Lehmi soft wheat (P. M. Halisky). Elsewhere infection was 2-tr. 2-sl. at widely scattered points in central Alta. (T. R. D.).

First reports of stem rust were from s. e. Sask. about 12 July. A survey of the area 15-18 July revealed a very light infection. In late July and early August stem rust was found in all fields between Moose Jaw and the Man. boundary via Weyburn, Estevan, and Carlyle, being present on 90% of stems in most fields. Later, stem rust was found west of Swift Current and as far north as Green Lake (H. W. M.).

Traces of stem rust were recorded on a few varieties in winter wheat plots at Ste. Anne de la Pocatiere, Que. (L. J. Coulombe). Only a tr. of rust was noted in York Co., N. B. (J. L. Howatt) and in Queens Co., P. E. I. (R. R. Hurst). For a general review of stem rust, and the races involved, see under Rust Nurseries and Physiologic Races. Since the former report was written, it has been estimated that the yield loss caused by leaf rust and stem rust to common wheat in Man. amounted to about 15% and that two-thirds of this loss was caused by leaf rust.

LEAF RUST (Puccinia triticina). Infection was 13-tr. 3-sl. 2-mod. 3-sev./30 fields of winter wheat in s. Alta., where it was first observed in mid-June. A sev. infection developed in late September on early-sown young stands (P. M. H.). Infection was 99-tr. 77-sl. 50-mod. 19-sev./484 fields of spring wheat examined in Alta. (P. M. H., T. R. D.). Leaf rust was not observed at the substation, Whitehorse, Yukon (G. B. Sanford). Leaf rust was found in all districts of Sask. but it was particularly sev. in s. e. Sask., where the stems also became sev. infected. Infection was 22-tr. 58-sl. 24-mod. 21-sev./168 fields. Although leaf rust was present on all fields of common wheat in the Elrose and Swift Current areas, it was not observed on durum wheat in these areas (H. W. M.).

Leaf rust was heavy on winter wheat in the plots at Ste. Anne de la Pocatiere, Que., infection being up to 50% on Rideau (L. J. Coulombe). A sev. infection of leaf rust was observed in wheat in Queens Co., P. E. I. (R. R. Hurst). See also under Rust Nurseries.

BROWNING ROOT ROT (Pythium spp.) Infection was sev. on a crop of wheat at the Station, Scott, Sask.; on this land the crop and fallow strips have been alternated since 1935, without the addition of manure or fertilizer containing phosphate in the interval according to H. Friesen. Its development under these circumstances is to be expected. The disease was also observed on Marquis, a slightly more susceptible variety than Thatcher, on summer-fallow at Kindersley. Cf. Sci. Agr. 32:443-452. 1952. (T. C. Vanterpool).

SNOW MOULD (Sclerotinia sp. indet.) Sev. damage was reported in fields of winter wheat near Vanderhoof, B. C. Specimens yielded only a low-temperature Sclerotinia identical with the fungus isolated from grasses damaged in the plots at Prince George in 1951 (P. D. S. 31:39). Additional damage was not observed in these plots in 1952 (M. W. Cormack).

SPECKLED LEAF BLOTCH (Septoria avenae f. triticea). Infection was 143-tr. 116-sl. 42-mod. 11-sev./484 fields of spring wheat examined in Alta. (P. M. H., T. R. D.). The disease was not observed at the Substation, Whitehorse, Yukon (G. B. Sanford). A mod. infection was noted in fields in the Lloydminster, Alameda and Meadow Lake areas in Sask.; it evidently caused some loss in yield because the kernels were shrunken (H. W. M.). Septoria diseases were again relatively severe in Sask. in 1952. Many of the leaf samples bearing spots even from fairly young plants proved to be caused by Septoria when the material was incubated. Although the moist season may account for the prevalence of these diseases in 1952, the evidence suggests their greater prevalence may be due to more inoculum being present, since more stubble is left on the surface of the soil with the introduction of the combine. In a sample from Wiseton received 25 June, perithecia were observed on one small piece of stubble although the ascospores were not fully delimited. Most of the infection was probably due to S. avenae f. triticea, but S. tritici was present on leaves of Kharkov winter wheat collected in the plots at Saskatoon on 29 July. (T. C. Vanterpool). See also under Rust Nurseries. T. E. Summers and D. H. Bowman (U. S. D. A. Pl. Dis. Reporter 37(3):142-147. 1953) report leaves of wheat severely affected by S. nodorum-like pycnidia and pycnidiospores in Mississippi, but S. tritici was not observed on the material examined. In fact S. nodorum was found on leaves, culms, and glumes of certain wheats. (I. L. C.).

NODE REDDENING. A conspicuous reddening of the lowest two or three nodes was reported by the Agricultural Representative from Colonsay, Sask. Isolations yielded two fungi, tentatively identified as Septoria sp. and Fusarium sp. No bacteria were observed (T. C. Vanterpool).

GLUME BLOTCH (Septoria nodorum). Infection was 108-tr. 75-sl. 26-mod. 18-sev./484 fields examined in Alta. As in 1951, the disease was much more prevalent than usual, especially in central Alta. (P. M. H., T. R. D.). A mod. infection was found in the Lloydminster and Alameda areas of Sask. Small samples of affected heads from 4 widely scattered points in Sask. The loss in yield is unknown (H. W. M.). See also under Rust Nurseries.

SPECKLED LEAF BLOTCH (Septoria spp.) Infection was 3-tr. 3-sl./30 fields of winter wheat examined in s. Alta. (P. M. H.). A sl.-mod. infection was noted in the winter wheat plots at Ste. Anne de la Pocatiere, Que. (L. J. Coulombe). See also under Rust Nurseries.

DWARF BUNT (Tilletia brevifaciens G. W. Fischer). A few plants were found affected in a field of Kharkov at Creston, B. C. No dwarf bunt was found in s. Alta. (P. M. Halisky). The disease is already known from the Armstrong-Enderby district in B. C. (P. D. S. 11:6 and 23:3-4).

Dwarf bunt was discovered in Ont. in 1952, when it was found in early August in a field of Cornell 595 at Keswick, York Co. A second infected field of the same variety was reported by Dr. Blair H. MacNeill, O. A. C., Guelph, in the same area. In the original field, infection was confined to the edge of the field, where it was estimated that 0.1% of the heads were affected.

Affected culms were 11-24 in., av. 18.7 in. in height and healthy culms were 24-45 in., av. 39.8 in. The bunt balls were noticeably weathered, resulting in large masses of spores being smeared on the glumes and rachis of the spike. These spore masses are readily wetted with water. In Shear's mounting fluid the gelatinous sheath about the spore is readily demonstrated. An examination of 144 samples of commercial and seed grades of winter wheat, 106 samples by us and the rest by Miss Jean E. Newman, Plant Products Division, Production Service, revealed spores of T. brevifaciens present on 4 samples as follows: one of Cornell 595 from Minesing, Simcoe Co., two of the same variety from Omemee, Victoria Co., and one of Rideau from Belleville, Hastings Co. The latter sample contained a bunt ball of dwarf bunt. A fuller account of this survey for dwarf bunt will appear in the Can. Jour. Agr. Sci. (I. L. Conners and A. J. Skolko).

BUNT (Tilletia caries and T. foetida). The data presented in Table 3 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 were again low and the figure for the previous crop year was also lower than was to be expected from the data for the first quarter (P. D. S. 31:4).

Table 3. Wheat bunt in Western Canada

| | Aug. 1, 1951 to July 31, 1952. | | | Aug. 1 to Oct. 31, 1952. | | |
|---|---|---|---|---|---|---|
| Class of Wheat | Cars Inspected | Cars Graded Smutty | Percentage Graded Smutty | Cars Inspected | Cars Graded Smutty | Percentage Graded Smutty |
| Hard Red Spring | 239,964 | 101 | 0.04 | 63,506 | 60 | 0.09 |
| Amber Durum | 6,993 | 10 | 0.14 | 2,027 | 3 | 0.15 |
| White Spring | 314 | 0 | 0.00 | 72 | 0 | 0.00 |
| Alberta Red Winter | 373 | 9 | 2.41 | 191 | 4 | 2.09 |
| Garnet | 1,162 | 0 | 0.00 | 236 | 1 | 0.42 |
| Mixed Wheat | 306 | 0 | 0.00 | 56 | 0 | 0.00 |
| All classes | 249,112 | 120 | 0.05 | 66,088 | 68 | 0.10 |

Bunt infection was 5-tr./30 fields of winter wheat examined in s. Alta. (P. M. Halisky). Infection was 3-tr. 1-sl. and 2-mod./484 fields of spring wheat examined in Alta. The tr. infections were found in the Peace River District; the other infected fields were in s. Alta. (P. M. H., T. R. D.). Bunt was found in only 4 fields out of 175 examined in Sask. Infection was tr. in 2 and between 3-10% in 2 (R. C. Russell). A trace of bunt was found in one field out of 105 examined in Man. and e. Sask. (W. J. Cherewick).

When the samples of winter wheat of Ont. origin were being examined for dwarf bunt (q. v.), it was noted that most of the samples were contaminated with spores of T. foetida. Among the 94 commercial samples examined, only 12 were free of bunt spores and some 54 contained bunt balls as well as carrying a heavy spore load. T. caries was relatively scarce being present in but 12 samples of the 144 examined and then only in trace amounts.

When the Grain Inspection records for Eastern Canada were tabulated, it was found that for the first quarter of the current crop year (Aug. 1 to Oct. 31, 1952) 8.7% (121,000 bu.) of the white winter wheat and 6.0% (172,000 bu.) of all winter wheat inspected had graded smutty. Indeed, the losses have been high since 1945-46. (I. L. Conners, A. J. Skolko).

LOOSE SMUT (Ustilago tritici). Infection was 12-tr. 1-sl./484 fields of spring wheat examined in Alta. (P. M. H., T. R. D.). A tr. was found in 2 fields out of 175 examined in Sask. (R. C. Russell). Out of 105 fields of wheat examined in Man. and the e. half of Sask. loose smut infection ranged from 0 to 3.5%, av. 0.2%. Fields of Lee wheat accounted for most of the loose smut.

BACTERIAL BLACK CHAFF (Xanthomonas translucens). Infection was 1-tr. 1-mod./30 fields of winter wheat and 9-tr. 3-sl./124 fields of spring wheat examined in s. Alta. Exudate was apparent on leaf lesions in one field of spring wheat (P. M. Halisky). The disease was common around Edmonton and elsewhere in central Alta. in fields of Thatcher and Saunders; infection was tr-mod. (A. W. Henry). A sl.-mod. infection attributed to X. translucens was noted on the leaves of Kharkov in the plots at Saskatoon, Sask.; bacterial ooze was present on the lesions (T. C. Vanterpool).

STREAK MOSAIC (virus) was found on both winter and spring wheat in southern Alta. in 1952. The disease is apparently identical with the wheat streak that has caused damage in some winter wheat areas in the great plains region of the United States. The disease was originally described by H. H. McKinney (U. S. D. A. Circ. 442. 1937). The symptoms of the disease are greenish yellow to yellow, interrupted or fairly continuous, streaks in the leaves parallel to the veins. Entire leaves may become chlorotic. Affected plants are usually stunted, and the yield and quality of the grain is reduced.

Severe damage from streak mosaic was observed in several fields of winter wheat in the Cardston and Pincher Creek districts of Alta. and in some fields the crop was not worth harvesting. These latter fields were sown early in August 1951 near crops already infected. Other fields suffered reduction in yield, but the losses became progressively less the longer seeding was delayed. Some mosaic-infected plants were present in late fields, but the losses were negligible. Streak mosaic was also found in many fields of spring wheat in areas where winter wheat was grown. Infections sufficiently heavy to cause severe damage occurred only in spring wheat growing near infected winter wheat.

In the fall of 1952, streak mosaic occurred in many fields of winter wheat sown in August and early September. Volunteer wheat plants growing in either summerfallow or stubble fields have proven a real menace to the crop. These plants become infected with the disease in late summer or early fall and are the sources of infection of early-sown crops of winter wheat in the vicinity. The virus was readily transmitted mechanically in the greenhouse (J. T. Slykhuis).

CHLOROTIC BANDING (high temperature at soil surface) caused sl. damage in a field at Humboldt, Sask., about 21 May. The crop was also sown too deep; as a result, the seedlings were weak and emerged late, probably aggravating the trouble (T. C. Vanterpool).

HEAD DISCOLORATION (cause unknown). Some 10% of the glume area was darkened on 40 and 60% of the heads in two fields at St. Francois Xavier and St. Eustache, Man. (W. A. F. Hagborg).

NITROGEN DEFICIENCY was suspected in fields located on heavy clay at Kindersley and Estonia, Sask. The plants were yellow and growth poor. The condition was probably brought about by incorporation of too much trash. Following a year of heavy straw growth and a return to the land of practically all the straw in combine-harvesting, nitrogen deficiency might become a problem in fields where there is insufficient moisture to rot the straw fairly quickly. During the last 2 years wheat on stubble has given a good response to applications of 16-20-0 fertilizer in some localities in the brown soil zone in w. central Sask. (T. C. Vanterpool).

2,4-D DAMAGE. Severe damage was observed in fields of Saunders wheat that had been sprayed by aircraft with a mixture of 2,4-D in diesel fuel oil. In one field of Saunders, 98% of the culms were a pronounced purple colour. The pigmented stems usually bore bleached spikes with sterile florets and yields were greatly reduced (P. M. Halisky). Some 5 cases of 2,4-D injury in Sask. were brought to the writer's attention. In some instances, the yield would be reduced (T. C. Vanterpool).

WINTER INJURY. Several hundred acres of winter wheat in the Armstrong-Enderby district, B. C., showed injury in the spring. In some fields, the injury was so extensive they were plowed up and replanted to some other crop. Patches of wheat up to several acres in extent were completely wiped out. In others, the plants survived but produced only a few tillers with few secondary roots. Uninjured plants produced numerous tillers and roots. The injury appeared to be caused by heavy winter snows that did not completely disappear until 1 April. The fields were still under a foot or more of snow on 1 March and were still under snow during mild growing weather (G. E. Woolliams). The possibility that the injury was due to snow mould (q. v.) does not seem to have been investigated (I. L. C.).

## OATS

ANTHRACNOSE (Colletotrichum graminicola). Mod. damage was reported in a 20-acre field at Buffalo Lakes, Alta. (A. W. Henry).

POWDERY MILDEW (Erysiphe graminis). Sl. infection was observed on Eagle in the University plots, Vancouver, B. C. (H. N. W. Toms). Tr. infection in 2 fields in Alta. (T. R. D.).

COMMON ROOT ROT (Fusarium spp.). Infection was 24-tr. 10-sl./303 fields examined in Alta. (P. M. H., T. R. D.).

LEAF BLOTCH (Helminthosporium avenae). Traces were observed in the plots at Ste. Anne de la Pocatiere, Que. (L. J. Coulombe).

HALO BLIGHT (Pseudomonas coronafaciens). Infection was 149-tr. 46-sl. 6-mod./303 fields examined in Alta. Halo blight was more prevalent and far more sev. in n. Alta. than elsewhere in Alta. The disease tended to decrease gradually in prevalence and severity from n. to s. with only one infected field seen in s. Alta. (P. M. H., T. R. D.). Halo blight affected a trace to 60% of the leaf surface in fields observed in Man. Pathogenic isolates 4017 and 4072 were obtained (W. A. F. Hagborg).

STRIPE BLIGHT (Pseudomonas striafaciens) affected 30% of the leaf area in a field at Pipestone, Man.; pathogenic isolate 4066 was obtained. A sample of sev. diseased plants were received from Nipawin, Sask.; isolates 4019 and 4058 were made (W. A. F. Hagborg).

CROWN RUST (Puccinia coronata) was heavy on M. C. 433 in the Quebec Seed Board plots at Ste. Anne de la Pocatiere on 8 Aug. and mod. plus on Abegweit and Vanguard at St. Flavien on 13 Aug. (D. Leblond). Infection was sl. -mod. in the plots at Ste. Anne de la Pocatiere (L. J. Coulombe). Only a few infected fields were noted in York, Carleton, and Victoria counties, N. B. (J. L. Howatt). Crown rust was very light at Kentville, N. S. (D. W. Creelman) and throughout P. E. I. (D. B. Robinson). See also Rust Nurseries and Physiologic Races.

STEM RUST (Puccinia graminis). A tr. of rust was observed on Eagle in the University plots, Vancouver, B. C. (H. N. W. Toms). Stem rust was widespread in Kings Co., N. S., infection ranging from tr. to 50% (D. W. Creelman). See also Rust Nurseries and Physiologic Races.

BROWNING ROOT ROT (Pythium sp.) was observed on 23 June at Nora, Sask. The damage to the roots was heavy for oats. P. debaryanum types were most commonly isolated (T. C. Vanterpool).

SPECKLED LEAF BLOTCH (Septoria avenae). Infection was 50-tr. 23-sl./303 fields examined in Alta. (P. M. H., T. R. D.). Speckled leaf blotch affected most varieties in the plots at Ste. Anne de la Pocatiere, Que., infection ranging up to 25-30% of the leaf area. (L. J. Coulombe). The disease was observed at 2 places in Kings Co. and in the plots at Nappan, N. S. Infection averaged about 20% (D. W. Creelman, K. A. Harrison). Speckled leaf blotch caused about 10% lodging in a field of Abegweit at New London, P. E. I. Most varieties are susceptible, but Abegweit is one of the more susceptible (G. W. Ayers). Stem symptoms were observed at Long River (D. N. Robinson). See Rust Nurseries.

SMUTS (Loose Smut, Ustilago avenae and Covered Smut, U. kolleri). Loose smut was found in one field of Winter Turf in N. Saanich, B.C. (W. Jones). Smut infection was 25-tr. 22-sl. 6-mod. 5-sev./303 fields examined in Alta. (P.M.H., T.R.D.). Only 3 fields were examined in Sask., but a tr. occurred in two (R.C. Russell). Of the 154 fields of oats surveyed in Man. and in the e. half of Sask., smut infection ranged only from 0 to 4.0%, and averaged 0.3% (W.J. Cherewick). A tr. of loose smut was found in a block of M.C. 2639 inspected at Macdonald College, Que. (H. Genereux) and this variety and several others were affected by smut in the plots at Ste. Anne de la Pocatiere (L.J. Coulombe). Tr. infections were noted in Carleton Co. and up to 3% of the heads affected in several other counties in N.B. (J.L. Howatt). Loose smut affected 10% of the heads in a field in Kings Co., N.S. (K.A. Harrison). A sl. infection of covered smut was recorded on Abegweit at Charlottetown, P.E.I. (D.B. Robinson).

BLAST (non-parasitic) was recorded as follows: Tr. on Victory and Eagle in the plots, Vancouver, B.C. (H.N.W. Toms); injury 146-tr. 114-sl. 26-mod. 1-sev./303 fields examined in Alta. (P.M.H., T.R.D.); sl. damage in all areas of Sask. as growth conditions were favourable for filling of the spikelets (H.W.M.). Mod. everywhere in the Q.S.B. plots; it was heavy on Abegweit and M.C. 433 at St. Flavien (D. Leblond).

GREY SPECK (manganese deficiency) was mod.-sev. in one field at St. Norbert, Man.; the yield reduction was estimated to be 25% (W.A.F. Hagborg).

## BARLEY

ERGOT (Claviceps purpurea). Infection was 20-tr. 3-sl./377 fields in Alta. (P.M.H., T.R.D.). A tr. infection in one field at Yorkton, but only 12 fields were examined in Sask. A light infection was common on many varieties in the plots at Saskatoon, Scott, and Melfort. (H.W.M.). A sl. infection was recorded on barley at Charlottetown, P.E.I. (J.E. Campbell).

POWDERY MILDEW (Erysiphe graminis). Tr. on Olli in the University plots, Vancouver, B.C. (H.N.W. Toms); mod. plus on Mensury and O.A.C. 21 in the Q.S.B. plots at Notre Dame du Lac, Que. (D. Leblond). See also Rust Nurseries.

STRIPE (Helminthosporium gramineum). Infection was 4-tr. 1-sl. 1-sev./319 fields examined in central and n. Alta. (T.R.D.).

COMMON ROOT ROT (Helminthosporium sativum and Fusarium spp.). Infection was 77-tr. 119-sl. 40-mod. 5-sev./377 fields examined in Alta. The disease was more severe than in 1951. Compana was mod. infected in most of fields of this variety examined (P.M.H., T.R.D.). No root rot was observed on barley at the Substation, Whitehorse, Yukon (G.B. Sanford). Infection was 1-sl. 4-mod. 4-sev./9 fields examined in Sask. (H.W.M.).

NET BLOTCH (Helminthosporium teres). Infection was 115-tr. 85-sl. 22-mod. 7-sev./377 fields examined in Alta. It was more common and severe than usual, but it was not as prevalent as scald (q. v.). Net blotch was present in 57% of the fields in s. Alta. and in 63% of those in central and n. Alta. (P. M. H., T. R. D.). Net blotch was present in 8 fields out of 12 examined in Sask. Barley was sev. infected in the plots at Scott and Melfort and in most farmers' fields in n. e. Sask. The disease killed many of the leaves and mod. infected the heads. Frequent showers favoured the disease (H. W. M.).

BROWN STRIPE (Pseudomonas sp.), apparently an undescribed disease, was observed on barley in Man. It is characterized by long stripes on the leaves. The central area of the stripes are amber-coloured and translucent, bordered by light to dark brown margins (W. A. F. Hagborg).

STRIPE RUST (Puccinia glumarum). Sl. infections were found in 2 fields of late-sown barley in s. Alta. (P. M. Halisky).

STEM RUST (Puccinia graminis). Infection was 4-tr. 1-sl./58 fields examined in s. Alta.; infection appeared in late August (P. M. Halisky). A tr. infection was found in one field at Gull Lake, s. w. Sask.; light infections were noted on all common varieties in the plots at Indian Head and Saskatoon. (H. W. M.). A sl. infection was observed on barley at Charlottetown, P. E. I. (J. E. Campbell). See Rust Nurseries.

LEAF RUST (Puccinia hordei). See Rust Nurseries.

SCALD (Rhynchosporium secalis). Infection was 111-tr. 85-sl. 54-mod. 38-sev./377 fields in Alta. The disease was extremely prevalent and more severe than usual. It was found in 67% of the fields examined in s. Alta. and in 75% of those in central and n. Alta. (P. M. H., T. R. D.). Infection was 2-sl. 1-mod./12 fields examined in Sask. Scald was mod-sev. on some 200 lines of Velvon barley at Scott and mod. on all varieties at Melfort. There is little evidence of varietal resistance (H. W. M.). See Rust Nurseries.

SPECKLED LEAF BLOTCH (Septoria passerinii). Infection was 81-tr. 58-sl. 19-mod. 5-sev./377 fields examined in Alta. Although the disease was found in only 3 fields in s. Alta., it was much more prevalent than usual in central and n. Alta. (P. M. H., T. R. D.). Speckled leaf blotch destroyed 25% of the leaf area in one field at Poplar Point, Man. (W. A. F. Hagborg). It was general in the Lake St. John region, Que. (D. Leblond). Small amounts were observed in the plots at Ste. Anne de la Pocatiere (L. J. Coulombe). See also Rust Nurseries.

COVERED SMUT (Ustilago hordei). Infection was 21-tr. 26-sl. 4-mod. 1-sev./377 fields examined in Alta. The disease was slightly less prevalent than in 1951 (P. M. H., T. R. D.). Tr.-sev. infection was noted in 3 out of 10 fields examined between Edmonton and Barrhead. In one field, 30% of

heads were affected by covered smut and 20% by loose smut (A. W. Henry). A sl. infection was found in a barley field at the Substation, Whitehorse, Yukon. (G. B. Sanford). Infection was 1-2% in 2 fields out of 12 examined in Sask. (R. C. Russell). Covered and false loose smut (U. nigra) were noticeably less prevalent than in 1951 in the 199 fields examined in Man. and in the e. half of Sask. Infection ranged from 0 to 22.0%, av. 1.5% (W. J. Cherewick).

LOOSE SMUT (Ustilago nuda). Infection was 74-tr. 41-sl. 10-mod. 3-sev./377 fields examined in Alta., with its prevalence unchanged from 1951. (P. M. H., T. R. D.). Infection was sl.-sev. in 8 fields out of 10 examined between Edmonton and Barrhead. My impression was that loose smut was more severe than usual, with some fields with 30-40% of the heads infected (A. W. Henry). No loose smut was observed at the Substation, Whitehorse, Yukon (G. B. Sanford). Infection was tr. in 1 field, 1-2% in 4, 3-10% in 1 and over 10% in one out of 12 fields examined in Sask. Germination tests of spores from 10 collections of loose smut from the above fields and other sources revealed U. nuda only in 6 samples, U. nigra in one and both smuts in 3 samples (R. C. Russell). In contrast to covered and false loose smut, true loose smut was more prevalent in Man. and in the e. half of Sask. than during the last 6 years; in the 199 fields examined infection ranged from 0-38%, av. 4.5% for all fields (W. J. Cherewick). Tr. was seen in a block of Montcalm at Macdonald College, Que. (H. Genereux) and in Fort and Vantage in the plots at Ste. Anne de la Pocatiere (L. J. Coulombe).

BACTERIAL BLIGHT (Xanthomonas translucens). Infection was 25-tr. 9-sl. 2-mod./377 fields examined in Alta. (P. M. H., T. R. D.). In Man. 1-25% of the plants were found infected; pathogenic isolates 4081 and 4082 were obtained (W. A. F. Hagborg).

FALSE STRIPE (virus). Infection was 5-tr. 3-sl./58 fields examined in s. Alta. (P. M. H.). In field experiments conducted at Winnipeg in 1952, a marked reduction in yield and kernel weight was found in plots artificially inoculated with the virus. The plants of both wheat and barley were dwarfed; other symptoms of the disease became obscure as the plants approached maturity. In further experiments on seed transmission it was found that nearly 73% of the seed from the inoculated plots produced diseased seedlings and only 12% developed healthy plants whereas 92% of the seed from the uninoculated plots produced healthy seedlings and less than 1% of seedlings showing false stripe. Observations in Man. suggest that although false stripe may be endemic on experimental plots of barley, it is a comparatively rare disease in farmers' fields (W. A. F. Hagborg).

## RYE

ERGOT (Claviceps purpurea). Infection was 10-tr. 9-sl. 3-mod./34 fields examined in Alta. (P. M. H., T. R. D.). Infection was sev. near edge and sl. plus over the rest of a field at Langham, Sask. (T. C. Vanterpool). A sl. infection was noted on rye in the rust nursery and on barley in

experimental plots at the Station, Fredericton, N.B. (J.L. Howatt). A sl. infection was seen at Charlottetown and Kensington, P.E.I. (R.R. Hurst).

POWDERY MILDEW (Erysiphe graminis) A tr. was found in a field of winter rye near Jefferson in s. Alta. (P.M.H.). Powdery mildew heavily infected a field of winter rye at Berwick, N.S. Lower leaves were completely yellow and wilted and all the leaves of most plants were attacked. The perfect stage was abundant. Whereas this field of rye was heavily attacked, a nearby field of winter wheat and timothy in an adjacent hayfield were unaffected and Agropyron repens on the roadside showed only a tr. infection (D.W. Creelman). See under Rust Nurseries.

COMMON ROOT ROT (Helminthosporium sativum and Fusarium spp). Infection was 4-tr. 8-sl. 4-mod. 3-sev./22 fields examined in central and n. Alta.; it was unreported from s. Alta. (T.R.D.). A specimen received from Kindersley, Sask. (T.C. Vanterpool).

LEAF BLOTCH (Helminthosporium sativum). The lower leaves on 75% of the plants were infected in a 4-acre field at Kentville, N.S.; damage was mod. (D.W. Creelman).

TAKE-ALL (Ophiobolus graminis). Infection was a tr. in a field near Brownvale and sl. in one at Sexsmith in the Peace River District, Alta. (T.R.D.).

STEM RUST (Puccinia graminis). Tr. infections were observed in 2 fields near Medicine Hat, Alta., on 13 August (P.M. Halisky). See also Rust Nurseries.

LEAF RUST (Puccinia secalina). Infection was 5-tr. 4-sl. 1-mod./12 fields examined in s. Alta.; it was not noted elsewhere (P.M.H., T.R.D.). See under Rust Nurseries.

SPECKLED LEAF BLOTCH (Septoria secalis). Infection was 5-tr. 3-sl. 1-mod./34 fields examined in Alta. (P.M.H., T.R.D.). A sl.-mod. infection was observed at Saskatoon, Sask. (H.W.M., T.C.V.).

STEM SMUT (Urocystis occulta). A sl. infection was noted in patches in a field at Seven Sisters, Man. (H.A.H. Wallace, A.M. Brown). Some 10-15% of the plants were affected in 5 fields visited at St. Thomas, Joliette Co., Que. (E. Lavallee). Specimens have been deposited in the Herbarium from both provinces (I.L.C.).

BACTERIAL BLIGHT (Xanthomonas translucens). Infections involving a small part to 60% of the leaf area were observed in Man. Pathogenic isolates 4020, 4024, 4025, 4059, and 4064 were made and all proved to be X. translucens f. sp. secalis. On the other hand, isolates from rye in recent years have been X. translucens f. sp. cerealis. (W.A.F. Hagborg).

PARTIAL STERILITY (2,4-D injury suspected). In a crop of fall rye in the plots at Saskatoon, Sask., the lower, centre, or upper third of the heads bore sterile florets; the rest of the head was normal. (T. C. Vanterpool).

## RUST NURSERIES IN CANADA IN 1952

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

In this report (issued November 1952) are presented the results of the examination of varieties of wheat, oats, barley, rye, and flax, grown in 34 places in Canada, for the presence of rusts and some other fungous diseases. (Detailed observations on the incidence of some of the diseases were given in eight tables but only the summary presented in the nineth table is reproduced here in Table 4).

Twelve varieties of wheat, seven of oats, five of barley, one of rye and three of flax were grown in the nurseries. The varieties were: wheat - McMurachy, Lee, Carleton, Little Club, Marquis, Mindum, Thatcher, Yaroslav Emmer, Norka, Redman, Exchange, and Frontana; oats - Bond, Trispernia, Ajax, Vanguard, Garry, Clinton, and Landhafer; barley - Montcalm, Wisconsin H. 106, Vantage, Peatland, and Univ. Manitoba 43-1020; rye - Prolific; and flax - Dakota, Bison, and Rocket.

### Cereal Rusts in the Prairie Provinces in 1952

Wheat stem rust (Puccinia graminis var. tritici) began its northward spread, this spring, from very small beginnings owing to scanty overwintering in the southern United States and Mexico. Its spread was thereafter limited for some time by dry weather and low temperatures with the result that by mid-May there was less stem rust than usual in northern Texas. Later stem rust found rather favorable conditions for increase in northern Oklahoma and Kansas, and from this area a northward spread into the spring wheat region took place in June. Dry weather, in June, in the Dakotas and Minnesota was undoubtedly a factor militating against any rapid increase of stem rust in that area. In consequence, the drift of spores northward was relatively light until early in July.

Wheat stem rust was first collected near Winnipeg on 30 June and could be found, a week later, in most wheat fields in the Red River Valley. Further spread was rather slow but by 24 July it was present on wheat and barley throughout southern Manitoba and in southeastern Saskatchewan. At harvest appreciable stem rust infection had spread westwards and northwards to a boundary definable by a line drawn from Swift Current, Sask., northeast to Saskatoon and east from there to Kelvington, Sask., and Swan River, Man. In the western and northern part of this area (west of Regina and north of Yorkton) infection was too light to cause appreciable damage. On common wheat and barley, heavy stem-rust infection was largely limited to the Red River Valley and adjacent interlake district. In this region, late-maturing crops were subject to considerable loss although the bulk of the crop escaped with slight damage. Damage to durum wheat extended over a considerably greater area owing to its later maturity and the fact that most of the stem rust consisted of race 15B to which durum wheat is highly susceptible.