I. DISEASES OF CEREAL CROPS

WHEAT

BLACK MOULD (Alternaria tenuis and Cladosporium sp.) was so heavy at Kindersley, Sask., according to the agricultural representative, that the spores, as a greenish black powder, could be scooped up from the swathers. Four other specimens of black mould were received from scattered places in Sask. (T.C. Vanterpool). Infection was 3-tr. 2-sl./674 fields examined in Alta. The affected heads were all in fields n. of Vegreville (W.P.C.).

ERGOT (Claviceps purpurea). A single affected head was brought in from Queens Co., P.E.I. (R.R. Hurst). See Ergot Survey.

POWDERY MILDEW (Erysiphe graminis) infection was 1-sev./6 fields of winter wheat at Creston, B.C., and 2-tr. 3-sl./13 fields in s. Alta. The disease was relatively prevalent on spring wheat in s. Alta. where the infection was 26-tr. 7-sl. 3-mod./79 fields; only a trace occurred in one field in the Peace River area and in one in central Alta. out of the 576 examined (W.P.C., J.S.H.). Powdery mildew was sev. on the lower leaves in many fields of winter wheat about Harrow, Ont. (C.D. McKeen). See Rust Nurseries.

HEAD BLIGHT (Fusarium spp.). A tr. infection was observed in one field at Leross, Sask. (H.W. Mead). Infection was a trace in the 4 samples examined. The following species were isolated: Man.-Winnipeg, F. culmorum; Morris, F. graminearum; Kemnay, F. poae; Que.- Normandin, F. poae (W.L. Gordon).

COMMON ROOT ROT (Helminthosporium sativum and Fusarium spp.). Damage was 1-tr. 2-sl./6 fields of winter wheat at Creston, B.C. and 1-sl. /13 fields in s. Alta. (J.S.H.). Damage was 298-tr. 258-sl. 60-mod. 8-sev./655 fields of spring wheat in Alta. Damage was tr.-sl. in the Peace River area and over most of central Alta., but it was mod.-sev. east of a line joining Vegreville and Drumheller. The disease was more prevalent and destructive than usual in s. Alta. where some late-maturing heavy stands contained up to 10% prematurity blight (W.P.C., J.S.H.).

Common root rot was much more common in Sask. in 1953 than in the preceding year. The average disease rating of 12.22 was exceeded only in 1949 (13.39) and 1951 (13.66). The rating in 1952 was only 7.46. Although the crop yields were relatively high (provincial mean about 22 bu. per acre) in 1953, growing conditions were generally less favourable and root rot infections were consequently higher than in 1952. Rainfall was less favourably distributed in 1953 than in the previous season and some hot weather occurred in late July and mid-August. Disease ratings in 1953 for crop districts 1-9 were 7.6, 11.4, 15.6, 13.3, 6.6, 11.7, 12.5, 18.0, and 10.9 respectively. September estimates of wheat yields for crop districts 1-9 were 22, 21, 23, 20, 26, 22, 22, 26, and 20 bu. per acre respectively. Unlike most years, there is little correlation between disease ratings and estimated yield. The prematurity blight phase of common root rot was more common than usual. It occurred in 18 fields out of 206 surveyed. The average damage was a trace, although the loss in individual fields ranged up to 5%. Specimens identified as affected by prematurity blight were received from 10 localities. The condition was present in e. and central Sask.

An examination was made of the root rot disease ratings over the years 1941 to 1953 when the data were taken on a comparable basis. A marked upward trend is evident in the disease rating for the province when the average annual ratings are plotted. In Fig. 1, the fluctuation from year to year is shown by the dotted line joining the annual ratings, and the upward trend by a heavy line showing the five-year moving average, and by a straight line fitted to the data by the method of least squares. The latter line shows an average annual increment in the disease rating of 11.23 - 8.30 = 0.297 over the period. The low disease

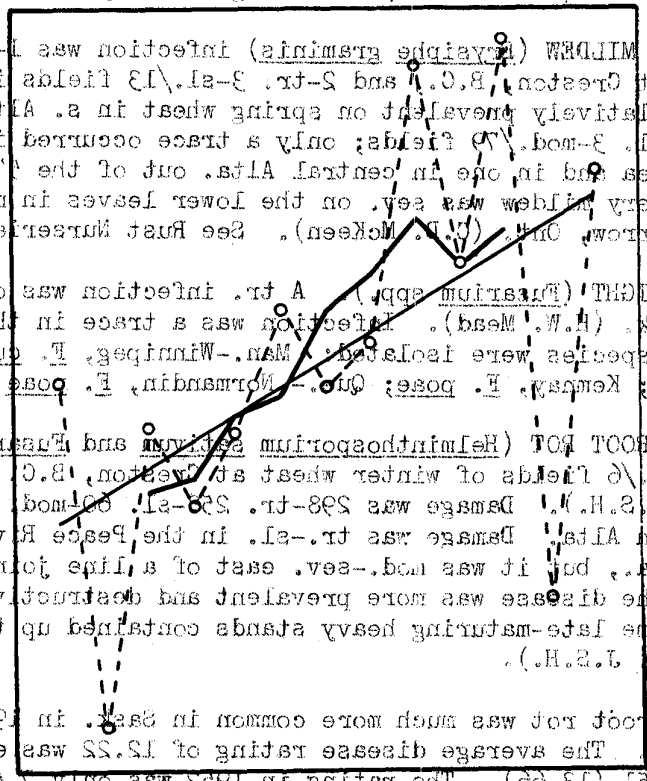

FIGURE 1

Fig. 1. Upward trend in common root rot over a period of 13 years in Sask. Dotted lines connect annual provincial averages. The heavy line represents the five-year moving average, while the light straight line was fitted by the method of least squares.

ratings for the excellent crop years of 1942 and 1952 appear to have interrupted the regular increase in the disease, so that the line based on the moving five-year average may represent the data better than the straight line of best fit. Evidence of an upward trend emphasizes the importance of the annual survey for common root rot in order to assess its progress (B.J. Sallans).

Common root rot was heavy in a field, which appeared to be slightly alkaline, near Dafoe, Sask. Root rot was present on specimens received from Cavalier, Prince Albert, and Stockholm; the basal nodes appeared to have been injured by 2,4-D. Root rot also appeared responsible for the poorly filled heads in a sample of winter wheat from the Tisdale area. (T.C. Vanterpool).

SPOT BLOTCH (Helminthosporium sativum). A sl. infection was noted in a field at Portage la Prairie and in one at Poplar Point, Man. (J.E.Machacek).

TAKE-ALL (Ophiobolus graminis). Damage was 1-mod./6 fields of winter wheat examined at Creston, B.C., and 3-tr. 3-sl. 1-mod. 1-sev./13 fields in s. Alta. (J.S.H.). Damage was 72-tr. 66-sl. 20-mod. 17-sev./655 fields of spring wheat in Alta. The damage was considerable in east-central Alta., in an area between Vermilion, Coronation, and Camrose, being sev. about Strome and Killam (W.P.C., J.S.H., A.W. Henry). Take-all was observed in 15/206 fields examined in Sask. The disease was common in n.e.Sask., about 2% loss occurring at Dafoe, Quill Lake, and McKague. In 2 fields (second crop after summer fallow) at Elrose visited on request, about 5% of the plants were severely stunted (B.J. Sallans). Take-all was observed in 6 fields in an area east and north of Quill Lake, infection being a trace to 10-15%. Near Clair, large affected spots, visible from the road, were present with a scattered infection throughout one large field. Diseased specimens were received from 4 widely scattered points also in n.e. Sask. (T.C. Vanterpool). Affected winter wheat specimens were received in 1952 from Bowmanville and Bradford, Ont. (E.T. Reeder).

On slight evidence Petrak has supported Fitzpatrick et al. (Mycologia 14:30-37. 1922) in considering Ophiobolus graminis as a later synonym of O cariceti. He concludes that Gaeumannomyces is synonymous with Linocarpon Sydow and therefore reduces G. graminis (Sacc) v. Ark & Olivier (see P.D.S. 31:2) to his new combination Linocarpon cariceti (Berk. & Br.) Petr. (Sydowia 6:387. 1952) (I.L. Conners).

BASAL GLUME ROT (Pseudomonas atrofaciens) was reported to be sev. in a field near Berwyn, Alta. (W.P.C.). A sl. infection was observed in 9 fields in the Indian Head-Melville area, Sask., during the annual survey (H.W. Mead).

Cultures of Pseudomonas sp. pathogenic to seedlings were isolated from large bacterial lesions on the shot-blade and sheath of both durum and common wheat varieties. The disease was found at Morden, Poplar Point, and Pilot Mound, Man. (W.A.F. Hagborg).

STRIPE RUST (Puccinia glumarum[1]) infection was 1-tr. 1-sl. 11-sev. in

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[1] According to Hylander,Jørstad and Nannfeldt (Opera Bot. Soc. Bot. Lund 1 (1):75. 1953), the correct binomial for this rust is Puccinia striiformis West., being the oldest name "founded on descriptions of the teleuto state". Previously most authors considered P. striiformis a synonym of P. rubigo-vera.

wheat at Creston, B.C. (J.S.H.); a trace was also found near Dawson Creek (W.P.C.). See also Rust Nurseries.

STEM RUST (Puccinia graminis) infection was 1-sl./6 fields of winter wheat at Creston, B.C. but none was found in s. Alta. Infection was 145-tr. 35-sl. 6-mod. 8-sev/655 fields of spring wheat in Alta. No rust was found west of Pincher Creek, but it was sev. in early September on late-sown Lemhi at Brooks. Pustules of stem rust were unusually common on the leaves (J.S.H.). Although stem rust was generally distributed through central Alta., the attack came too late to cause damage except in 4 fields of Thatcher found damaged near Lloydminster. The fact that Thatcher was rusted suggests the presence of race 15B. No stem rust was found in the Peace River district (W.P.C.). Stem rust was present in most fields in Sask., but mod.-sev. infections were confined to the s.e. quarter of the province. Shrivelling of the grain was common in this area (H.W.Mead). Stem rust was generally sl. in N.B. this year. In the Station plots, Fredericton, infection was nil on Selkirk and R.L. 2629, mod. on Cascade, Huron and Acadia, and sev. on Climax (J.L. Howatt). Stem rust rarely caused damage even to susceptible varieties in P.E.I., probably because the crop was sown early; damage was sev. in one field of Garnet (R.B. McLaren). For a more complete discussion of stem rust development in the Prairies see Rust Nurseries.

LEAF RUST (Puccinia triticina). Infection was 1-tr. 3-sl. 1-mod./6 fields of winter wheat at Creston, B.C., and 1-tr./13 fields in s. Alta. (J.S.H.). Infection was recorded as 159-tr. 97-sl. 23-mod. 1-sev./655 fields of spring wheat examined in Alta. It was found in most fields examined in s. Alta., but it came too late to cause much damage. Rust was generally scattered in central Alta., but it was not seen in the Peace River area (J.S.H., W.P.C.). Leaf rust infection was fairly widespread in Sask., the heaviest infections were in s.e. and s. central Sask.; infection was sev. in 53 fields (W.H. Mead). Leaf rust infection was generally sl. in fields in N.B. and in the plots at Fredericton (P.N.Grainger). See also Rust Nurseries.

BROWNING ROOT ROT (Pythium spp.). Affected specimens received 9 June from Three Hills, Alta. (A.W. Henry). Although no enquiries about browning root rot were received in Sask. in June and July, plants, 36-37 in. tall, the heads of which were empty were sent in on 26 Aug. Most of the roots were filled with numerous Pythium oospores. The accompanying soil sample revealed a peaty, fluffy soil. Browning root rot has never been seen so severe on such tall plants or so late in the season. However, some of the most severe cases of browning root rot ever encountered were seen at Brancepeth, near Birch Hills, on peaty soil in the 1930's. What conditions favoured the late infection this year are unknown (T.C. Vanterpool).

ROOT ROT (Rhizoctonia solani). Mod. infection on a planting of Selkirk at Portage la Prairie, Man. Stem bases, crowns, and roots were partly rotted and the typical mycelium of R. solani was abundant in the decayed tissues (J.E. Machacek).

In May 1953, attention was drawn to a conspicuous yellowing and stunting of winter wheat in s.w. Ont. The centre of the affected area was located on the lighter soils in Kent Co., particularly in the vicinity of Highgate. The

disease occurred in patches in the field; within these patches the wheat plants were stunted and sometimes dead and the surviving plants were reduced in vigour; maturity would be delayed and yield low. It was estimated that the stand of plants in the affected areas was reduced 50% and the remaining plants had made only 40% as much growth as normal plants elsewhere in the same field. A tan-coloured cortical rot of the root system and dark zonate lesions on the basal leaf sheaths were the conspicuous symptoms on the plants.

Rhizoctonia solani was the chief fungus found in rotted stem and root tissues near the crown. The fungus appeared responsible for the severe basal rot, but was also present in less diseased plants. In addition, parasitic nematodes, chiefly Pratylenchus sp. were numerous in the root tissues of affected plants. Experiments to date have disclosed that R.solani alone may cause some stunting of wheat especially at high temperatures, but that when the nematodes are also present the stunting is more than doubled. It is suggested that the two pathogens must interact in some manner to produce this root rot of wheat. (W.G.Benedict, W.B.Mountain).

GLUME BLOTCH (Septoria nodorum) was not noted at Creston, B.C., but infection was 2-tr. 1-sl./13 fields of winter wheat examined in s. Alta. (J.S.H.). Infection was 76-tr. 73-sl. 38-mod. 12-sev./655 fields of spring wheat, being generally distributed in Alta. (W.P.C., J.S.H.). A sl. infection was found in 3 widely separated fields of the 190 examined in Sask. (H.W. Mead). Specimens received from Annaheim (T.C.Vanterpool).

SPECKLED LEAF BLOTCH (Septoria spp.). Infection was 1-tr. 2-sl. 3 mod./6 fields of winter wheat at Creston, B.C., and 6-tr. 4-sl./13 fields in s. Alta. (J.S.H.). In spring wheat, the infection was 119-tr. 242-sl. 156-mod. 38-sev./655 fields, being general in Alta., and most severe in the more mature fields (W.P.C., J.S.H.). Infection (S. avenae f. sp. triticea) was 2-tr. 16-sl. 6 mod. 5-sev./190 fields examined in Sask. It became rather prevalent late in the season in the eastern part of Sask. (R.J.Ledingham, H.W.Mead). From specimens submitted by R.J.Ledingham, typical S. avenae f. sp. triticea was found in a collection from Bruno, Sask., whereas Solenophoma donacis var. stomaticola occurred on one from Hawarden (I.L. Conners). S. avenae f. sp. triticea was mod. on varieties in the Que. Seed Board Plots at St. Charles de Caplan, Que. (D. Leblond, D.B.O.Savile). See Rust nurseries.

A grey leaf spot was observed on wheat seedings sent from Yorkton, Sask., on 26 June; it may have been caused by a Septoria, but no spores were seen (T.C. Vanterpool).

COMMON BUNT (Tilletia caries and T. foetida). The data presented in Table 1 were obtained from the records of the Board of Grain Commissioners. The percentage of cars graded smutty during the first quarter of the present crop year shows a slight increase over the final figures for the last two years, but it is still quite low (W. Popp).

Table 1. Common Bunt in Wheat in Western Canada

Class of Wheat	Aug. 1, 1952 to July, 1953			Aug. 1 to Oct. 31, 1953		
	Cars Inspected	Cars Graded Smutty	Percentage Graded Smutty	Cars Inspected	Cars Graded Smutty	Percentage Graded Smutty
Hard Red Spring	267,784	339	0.13	49,667	62	0.12
Amber Durum	5,202	11	0.21	2,742	6	0.22
White Spring	272	0	0.00	61	0	0.00
Alberta Red Winter	276	10	3.60	150	6	4.00
Garnet	1,844	6	0.32	484	1	0.21
Mixed Wheat	393	1	0.25	89	0	0.00
All classes	275,771	367	0.13	53,193	75	0.14

Out of 674 fields examined in Alta., infection was 10% and tr. in 2 fields near Lacombe and tr. in one field in s. Alta. (W.P.C., J.S.H.). Bunt was seen less frequently than usual in Sask.; only a tr. was found in 3/212 fields examined (R.C.Russell). Bunt was not found in the 93 fields examined in Man. (W. Popp). During a field survey of winter wheat for dwarf bunt in Ont., observations were also made on common bunt. Heads were collected for the physiologic form survey; only T. foetida was found. Out of 164 fields surveyed, 28 were affected by common bunt and two by both common and dwarf bunt. Infection varied from a tr. to 25%, av. 0.77%. As at least half the fields examined were on the farms of the better growers it is probable that common bunt would be found in more than 18% of the fields if a purely random survey were made.

Conners and Skolko (Can. J. Agr. Sci. 33(6):597-605. 1953) have drawn attention to the prevalence of common bunt in winter wheat in Ontario. Another year's figures may now be added to those given in their Table 1, p. 602.

They are:

Crop year	Class	Estimated production '000,000 bu.	Inspected '000 bu.	Graded Smutty '000 bu.	Percentage smutty
1953	White Winter		4,925	108	2.2
(Aug.-Oct.)	Total	26.6	7,866	161	2.0
1952	White Winter		5,635	214	3.8
	Total	20.8	9,432	304	3.2

These figures suggest come improvement (I.L. Conners, R.V. Clark).

DWARF BUNT (Tilletia contraversa Kühn). A tr. was seen in one field at Creston, B.C. (J.S. Horricks) and a single head was collected in the variety plots

at the Creston Substation (D.B.O. Savile).

A field survey for dwarf bunt was carried out in Ont. 1-18 July to obtain information on the present distribution of the disease in the province. As a result dwarf bunt was found in 25 out of 164 fields examined; in 2 fields common bunt (T. foetida) was also present. The affected fields by counties were distributed as follows: Bruce 3/12, Simcoe 17/30, York 4/11, Ontario 1/10. Infection appeared to be very uneven in the fields, but it was most readily found about the entrance to the field; it varied from a tr. to 25% about the entrance to some fields. Since the survey was completed, a bunt ball of dwarf bunt was seen in a grain sample from Middlesex Co. An extensive examination of grain samples by the Plant Products Division, in the Department of Agriculture indicates that dwarf bunt is even more widespread than the field survey suggested.

The most striking character of the affected plants is their dwarf stature. Affected heads on the primary culm are fully as large as healthy heads, but the culms carrying them rarely exceed half the height of the healthy culms. Although diseased plants may be present throughout the field, they are most easily located wherever the stand is poorer, i.e. about the entrance to the field, along the edges, in the dead furrows or where some erosion of the soil has occurred. (I.L. Conners, R.V. Clark).

In January 1954, an old collection of bunted heads of Dawson's Golden Chaff made 26 July 1947 from the same farm where dwarf bunt was found in 1952 was handed to us for examination; the heads proved to be affected by the dwarf bunt organism. As these heads came from a crop that had been treated by hot water to control loose smut and were found in that part of the field where wheat was grown in 1945, the inference is that dwarf bunt was present in Ont. previous to the introduction of Cornell wheat. However Cornell is not the only New York State variety that has been grown in Ont.; dwarf bunt may have been introduced in such varieties as Yorkwin. This belated discovery points to the difficulty formerly experienced in recognizing the organism from an examination of the spores. Undoubtedly the sample, if examined, was identified as T. caries (A.J. Skolko, I.L. Conners).

In a paper prepared for publication in the Can. Journal of Botany, the results are reported of a re-study of several species of Tilletia attacking the ovaries of grasses. It was concluded that Tilletia brevifaciens described by Fischer as the organism causing dwarf bunt of wheat and several grasses is not specifically distinct from T. contraversa Kühn originally described in 1874 on Agropyron repens, but also known on other species of Agropyron. Wheat probably first contracted dwarf bunt in the mountainous areas of Europe, where native species of Agropyron are found naturally infected by T. contraversa. The pathogen has been introduced into North America (I.L. Conners).

LOOSE SMUT (Ustilago tritici). Infection was 1-tr./13 fields of winter wheat examined in s. Alta. and 12-tr. 2 sl./655 fields of spring wheat in Alta., 9 in s. Alta. and 3 at Drumheller (W.P.C., J.S.H.). Loose smut was observed in 1/212 fields examined in Sask., but it was noticed several times in plots of Lee (R.C. Russell). The average infection in the 93 fields examined in Man. was 0.6%; in Lee, however infection varied from 0.1 to 5% and averaged 2.4% (W.Popp). Less than 1% of the heads were affected in a 40-acre field of winter wheat at Nictaux, N.S. (K.A. Harrison).

BACTERIAL BLACK CHAFF (Xanthomonas translucens). A tr. was seen in one field in s. Alta. (J.S. Horricks). In s. Man. the disease infected 80-100% of the leaves in the fields examined and destroyed 15-35% of the leaf area. The pathogen was isolated from samples collected at Boissevain, Brandon, Deloraine, Morden, Pipestone and Virden. It was isolated from Agropyron repens from Broomhill and Deloraine, A. sp. from Oak Lake and Bromus inermis from Deloraine (W.A.F. Hagborg).

STREAK MOSAIC (virus) was prevalent in the established winter wheat areas of s. Alta., where it was first recognized in 1952 (P.D.S. 32:7). (J.T. Slykhuis. Can. J. Agr. Sci. 33(2):195-197. 1953). It overwintered in many fields of winter wheat and seriously affected growth in the spring. At least 4 fields were considered worthless and were cultivated up and planted to other crops. In 25 other fields, winter wheat suffered sev. damage, with yields reduced in some from a possible 40 bu. per acre of No. 2 Northern to 5-6 bu. of No. 4 Northern. Severe damage in winter wheat was again correlated with early seeding in proximity to a source of infection. Several fields of spring wheat located near diseased winter wheat suffered sev. damage. Many other fields of winter and spring wheat were mod. or sl. affected by the disease.

The 1953 season afforded the first opportunity since the discovery of the mite vector Aceria tulipae to study the natural spread of streak mosaic in the field. The mites were always present where mosaic was abundant, but they were never found in districts where mosaic did not occur. During the late spring and summer, the mites and the virus were spread from diseased wheat crops and volunteer wheat in nearby fields. By harvest time, volunteer wheat was the main carrier of the mites and the virus was therefore the important source of infection of winter wheat sown in the fall. Many of these young stands became infected to varying degrees (J.T. Slykhuis).

BRITTLE DWARF (Brachycolus tritici) was conspicuous and severe on spring wheat growing near the University winter wheat plots. Aphids were present on all affected plants (T.C. Vanterpool). See P.D.S. 26:6.

HEAD STERILITY (Cause unknown) has been common in recent years than formerly particularly in n. and n.e.Sask. in wheat and less often in barley on plants otherwise well developed and without any discoloration being present at the base of the culm. It is suggested that heavy rains at a critical stage in the plants, growth about flowering or heading time result in the soil being water-logged for a few days so that roots do not receive sufficient air to sustain the plants. As a consequence of the disturbed water relations, the heads fail to set seed. It seems evident that some other factor than invasion by commom root rot organisms is responsible and should be looked for (T.C. Vanterpool).

SEEDLING DEATH appeared to be due to too deep seeding followed by 2-3 hot days soon after the seedlings emerged in material received from Prince Albert, Sask. This combination of factors operates quite often in Sask. to reduce cereal stands (T.C. Vanterpool).

2,4-D DAMAGE. Sl. injury to the crowns was observed in 2 fields (at Kelfield and St. Louis) in Sask. (H.W. Mead) and to the heads in a field at Perdue (T.C.Vanterpool).

WIND DAMAGE. The heads in 4 replicates of the durum variety D.T. 137 were partially or completely blighted at the Station, Morden,Man. (J.E. Machacek).

OATS

ERGOT (Claviceps purpurea) was a tr. in one field near Colinton out of 297 examined in Alta. (W.P. Campbell). See also Ergot Survey.

ROOT ROT (Fusarium spp.). Damage was 9-tr. 4-sl. 1-mod./297 fields examined at scattered locations throughout Alta. (W.P.C., J.S.H.). A heavy infection (3-5%) was observed in a field near Clair, Sask. (T.C. Vanterpool).

Fusarium graminearum was readily isolated from a specimen of oat stubble collected by Dr. J.H. Craigie from a field of oats that had badly lodged at Merrickville, Ont. Perithecia of Gibberella zeae were found on a few stems in the stubble specimen. Single ascospore cultures made from the perithecia were the usual 'wild type' and were identical with single conidial cultures of the wild type of F. graminearum obtained from corn in Southern Rhodesia. The collection of perithecia of G. zeae on oats is believed to be the first record of the occurrence on this host in Canada (W.L. Gordon).

LEAF BLOTCH (Helminthosporium avenae). Infection was: 4-tr. 11-sl. 1-mod./294 fields scattered through Alta.; sl. in 3 fields near Creston, B.C. (W.P.C., J.S.H.) 10% in 3 fields in Kings Co., N.S. (D.W. Creelman) and sl. in a field at Hunter River, P.E.I. (J.E. Campbell).

ROOT ROT (Helminthosporium victoriae caused 30% damage to Beaver oats in the oat trials at Notre Dame du Lac, Que. (L.J. Coulombe, R.V. Clark).

HALO BLIGHT (Pseudomonas coronafaciens) caused sl. damage to oats at Minnedosa, Jordan, and Winnipeg, Man. (W.A.F. Hagborg). Infection was 90-tr. 85-sl. 29-mod. 4 sev./297 fields examined in Alta., the more sev. infections being in central Alta. (W.P.C., J.S.H.).

STRIPE BLIGHT (Pseudomonas striafaciens). Infection was sev. on seedlings at Brandon, Man., on 15 June, but later growth was less heavily infected, only a trace occurring on the uppermost leaves on 15 July (W.A.F. Hagborg).

CROWN RUST (Puccinia coronata). Infection was only 1-tr./25 fields in s. Alta. (J.S. Horricks). Only 15 fields were examined in Sask., but infection was 1-tr. 2-sl. 2-sev. mostly in e.-central Sask.; the rust was fairly heavy on late oats at Saskatoon (W.H. Mead). Crown rust became quite heavy on several varieties in the test at Ste Anne de la Pocatiere, Que., by 10 Aug., but infection was nil on Len. 39 and a trace on 4367-122 and 4274-37-4 (L.J. Coulombe). Crown rust was observed in several fields in Rouville and St. Hyacinthe Counties (L. Cinq-Mars, R. Crete). Crown rust was again light in N.S.; tr. infections observed at Kentville and South Ohio (D.W. Creelman). Infection varied from tr. to 10% in fields across P.E.I. (R.R. Hurst). See also Rust Nurseries.

STEM RUST (Puccinia graminis). Tr. found in 2 fields near Stettler, Alta. (W.P.C.). Infection was 4-tr. 5-sl. 2-mod. 1-sev./15 fields examined in Sask. (H.W.Mead). A 5% infection was recorded in several fields in Rouville and St. Hyacinthe Counties, Que. (L. Cinq-Mars, R. Crete). Damage was sev. in a field of Ajax at Woodstock, N.B.; the crop lodged early and kernels were poorly developed at harvest (S.R. Colpitts). Infection was tr. at Kentville and Grand Pre in Kings Co. and 25% at Upper Clyde, Shelburne Co., N.S. (D.W. Creelman). Very little stem rust was observed in P.E.I. this year (R.B. McLaren). See also Rust Nurseries.

SPECKLED LEAF BLOTCH (Septoria avenae). Infection was 15-tr. 27-sl. 6-mod./297 fields examined in Alta., almost entirely in n. and central Alta. (W.P.C., J.S.H.). The disease was quite heavy on some varieties in the plots at Ste Anne de la Pocatiere and Notre Dame du Lac, Que. (L.J. Coulombe). Speckled leaf blotch was general in Kings Co., N.S., and infection averaged 10-15%, but was less prevalent than last year (D.W. Creelman). A 5% infection was seen in a field in Queens Co., P.E.I. (R.R. Hurst). See Rust Nurseries.

SMUT (Loose Smut, Ustilago avenae and Covered Smut, U. kolleri) infected 51/297 fields examined in Alta.; infection was generally distributed and ranged tr.-35%, av. 3.2% in affected fields (W.P.C., J.S.H.). Covered smut was found in 10/15 fields inspected in Sask.; infection tr.-15%, av. 2.5%. No loose smut observed (R.C. Russell). Smut in oats was not severe in Man., infection ranging 0-11%, av. 0.6% in 65 fields inspected (W. Popp). Loose smut infection was 5% in a field of Ajax at Woodstock, N.B. (R.B. Colpitts); up to 5% in the few fields examined in Kings Co., N.S.; sl. in a late planting in Queens Co., P.E.I. Polygonum scabrum affected by Ustilago utriculosa occurred at the edge of the same field. A tr. of covered smut was noted in a second field (J.E. Campbell). Infection (tr.-10%) by the oat smuts was observed in about half the fields examined in Madawaska, Victoria, York, Kings and Albert Counties, N.B. (J.L. Howatt).

BLAST (non-parasitic). Damage was 92-tr. 85-sl. 45-mod. 9-sev./297 examined in Alta.; it was scattered through the entire area surveyed, occurring in no apparent pattern (W.P.C., J.S.H.). Blast caused sl. damage in 7/15 fields examined in Sask. (H.W. Mead). Blast caused mod. damage to a late-sown field in Queens Co., P.E.I. (J.E. Campbell).

HEAT INJURY. High temperature following a period of moist, cool weather caused the culms to dry up at the soil level in a field at Portage la Prairie, Man., although of normal appearance above and below the injured area. The culms had fallen over along considerable lengths of the drill rows by 12 June (J.E. Machacek).

GREY SPECK (manganese deficiency) caused sev. damage to a field of oats in an area of manganese deficiency w. of Spalding, Sask. The symptoms were typical and conspicuous in spite of good moisture conditions in the district this season. The plants were spotted and severely stunted and although some areas were better than others, there was little normal growth. See also under Barley (T.C. Vanterpool). Oat plants taken from a reclaimed peat field at Balmoral, Man., on 24 July showed typical symptoms of grey speck. The disorder is now also known from the following widely scattered localities in Man.: Elm Creek, Ethelbert, Erickson, Gilbert Plains, Mossey, Oak Bank, Prawda, Swan River, St. Norbert, and Winnipeg (W.A.F. Hagborg).

INTUMESCENCE. Specimens of a variety of Avena ?strigosa submitted by R.O. Lachance in the plots at Notre Dame du Lac, Que., Sept., bore outgrowths on the culms. No other variety was affected. No parasitic fungus could be found and nematodes were not found associated with the outgrowths by Dr. A.D. Baker. These outgrowths resembled closely the intumescences described by Sorauer (Handb. f. Pflanzenkrankh. 6. Aufl., Band 1, Teil 1, p. 414, 1933) on grass stems, particularly on oats. They occur most frequently on the culm, where it is covered by the leaf sheath. Cause of their occurrence is unknown (I.L. Conners).

BARLEY

ERGOT (Claviceps purpurea). A tr. occurred in a field in Queens Co., P.E.I., and one other sample was brought in for examination (R.R. Hurst). See Ergot Survey.

HEAD BLIGHT (Fusarium spp.). Sl. infection was observed in a field at Winkler, Man.; F. poae was isolated (W.L. Gordon). In a mixed field of 2-rowed barley and oats at New Glasgow, P.E.I., head blight caused sev. damage (J.E. Campbell).

STRIPE (Helminthosporium gramineum). Infection was 55-tr. 39-sl. 26-mod. 14 sev./415 fields examined in Alta. The disease was uncommonly prevalent throughout Alta. (W.P.C., J.S.H.). A sl. infection was seen at Kindersley, Sask., in 1/28 fields examined (H.W. Mead).

SPOT BLOTCH (Helminthosporium sativum). Infection was a tr. in a field at St. Francois Xavier and mod. and general over one at Broomhill (W.L. Gordon).

ROOT ROT (Helminthosporium sativum and Fusarium spp.). Infection was 11-tr. 146-sl. 49-mod. 9-sev./415 fields examined in Alta.; mod.-sev. infections were mostly in an area between St. Paul, Edmonton, Olds and Vermilion (W.P.C., J.S.H.). Infection was 5-sl. 12-mod. 11-sev./28 fields examined in Sask. The average disease rating was 18.8 compared with a rating of 12.2 for wheat (B.J. Sallans).

NET BLOTCH (Helminthosporium teres). Infection was 57-tr. 71-sl. 46-mod. 11-sev./415 fields examined in Alta., the heavier infections being in n. and central Alta. (W.P.C., J.S.H.). Infection mod. in 2 fields in s.e. Sask. out of 28 examined in Sask. (H.W. Mead). All the leaves were killed in a field at Willbrook; H. teres was isolated (W.E.Sackston). Mod. infection at Pradlboro (T.C. Vanterpool). Infection varied from tr. to 75-100% of the plants in the 7 fields in which the disease was observed in Man. In some fields all except the two top leaves were killed. In one field the leaves were severely yellowed; H. teres was isolated (W.L. Gordon). See Rust Nurseries.

TAKE-ALL (Ophiobolus graminis). Damage was sl. in one field in s. Alta. (J.S. Horricks).

BROWN STRIPE (Pseudomonas sp.) occurred in a mixed infection with bacterial blight at Winnipeg and Sidney, Man. Both Xanthomonas translucens and a Pseudomonas were isolated from samples from both places (W.A.F. Hagborg).

STRIPE RUST (Puccinia glumarum). A trace was found in 2 fields in B.C.- in s. B.C. and near Dawson's Creek (W.P.C., J.S.H.).

STEM RUST (Puccinia graminis). Infection was 13-tr. 9-sl. 1-sev./415 fields in Alta. The sev. infected field was near Hanna; all the others were in s. Alta. (W.P.C., J.S.H.). Infection was 5-tr. 9-sl. 5-mod. 3-sev./28 fields surveyed in most crop areas of Sask. (H.W. Mead). Uredinia were found on the palea and lemma but also apparently on the seed coat itself mostly near the apex of the kernel in a head of hybrid barley growing in the plots at Ottawa on 25 Aug. (R.V. Clark, I.L. Conners). The plots of barley were artificially inoculated with rye stem rust at the Station, Fredericton, N.B. The results

were: no rust on Hietter, 25-35% infection on Montcalm and O.A.C. 21 and 50-65% infection on L4752, U.M. 1623 and L5112 (J.L. Howatt). See Rust Nurseries.

LEAF RUST (Puccinia hordei). Infection was a tr. in 3 fields in s. Alta. (J.S. Horricks); mod. in one field at Langbank, Sask. (H.W. Mead). Traces were seen in rod-row plots at Charlottetown and in some late-sown fields in Prince Co., P.E.I. (R.R. Hurst).

SCALD (Rhynchosporium secalis). Infection was 80-tr. 90-sl. 52-mod. 66-sev./415 fields examined in Alta. The disease was uncommonly widespread and sev. in n. and central Alta. In the Edmonton area, it appeared early in June and caused sev. damage to barley in the seedling stage (W.P.C., A.W.H., J.S.H.). Scald and net blotch were heavy in a field at Radville, Sask; material brought to Indian Head by the Station staff revealed spores of R. secalis and on culturing yielded H. teres. (W.B. Sackston). See Rust Nurseries.

SPECKLED LEAF BLOTCH (Septoria avenae f. sp. triticea) was general on barley in the Q.S.B. test plots at Ste Anne de la Pocatiere and St. Charles de Caplan, Que. It was particularly noticeable on the leaf auricles. Specimens already preserved in the Mycological Herbarium at Ottawa include ones on barley from Indian Head, Sask., and Lennoxville, Que., and on Hordeum jubatum from St. Simeon, Que. (D.B.O. Savile, D. Leblond).

SPECKLED LEAF BLOTCH (Septoria passerini). Infection was 50-tr. 93-sl. 75-mod. 49-sev./415 fields in Alta.; very little blotch was observed in s. Alta., but it was common in n. and central Alta., being most sev. on mature crops (W.P.C., J.S.H.). Infection was 1-sl. 2-mod. 4-sev./28 fields in Sask.; the disease was heaviest in e. central Sask. (H.W. Mead). Infection was 4-tr. 3-sl. 7-mod. 6-sev./24 fields examined in Man (G.J. Green). See Rust Nurseries.

COVERED SMUT (Ustilago hordei) was general throughout Alta., affecting 44/415 fields examined; infection was a tr.-20% and averaged 2.0% in the affected fields (W.P.C., J.S.H.). Covered smut appeared slightly less prevalent than usual in Sask.; observed in 11/28 fields, infection was tr.-8%, av. 1% (R.C. Russell). Covered smut reported in Vantage at Prince Albert and slight infection of covered and loose smut at Prud'homme (T.C.V.). Losses due to false loose smut (U. nigra) and covered smut were lower in the 76 fields examined in Man. this year than in the last few years; infection ranged 0.6% and averaged 0.4% (W. Popp). A single head of O.A.C. 21 affected by covered smut was submitted from the Station, Normandin, Que.; the spores were white rather than olive-black (I.L. Conners).

LOOSE SMUT (Ustilago nuda) was general throughout Alta., affecting 148/415 fields inspected; in the affected fields infection was tr.-30%, av. 2.6% (W.P.C., J.S.H.). Loose smut was recorded in 11/28 fields examined in Sask., infection being tr.-6%, av. 1%; in the Kelvington Barley Seed Control Area, loose smut was almost absent from 11 fields sown with seed treated with hot water (R.C. Russell). Loose smut (U. nuda) infection ranged from 0-11% in Montcalm and 0-8% in Vantage; in the 76 fields examined in Man., average infection was 1.5% (W. Popp). Loose smut was reported to be sev. in a field of Montcalm at Espanola, Ont. (C.B. Kelly). A sl. infection was noted in many fields in York, Victoria, and Madawaska counties, N.B. (J.L. Howatt). (Except in Man., the spores do not appear to have been germinated to determine whether U. nuda or U. nigra was present).

BACTERIAL BLIGHT (Xanthomonas translucens). Infection was 16-tr. 8-sl. 3-mod. 1-sev./415 fields examined in Alta.; the disease was most common about Edmonton and east to the Sask. border (W.P.C., J.S.H.). Bacterial blight was more abundant than usual in s. central Man. Its spread was aided by frequent rains in May, June, and July. Every plant was infected in fields at Pigeon Lake, Pipestone, Broomhill, and Boissevain and 20-35% of the leaf area was destroyed. Mod. infections occurred also in fields at St. Francois, Pipestone, Brandon, Sidney, Winnipeg. X. translucens was isolated from every Man. sample and from one collection from Edmonton, Alta. (W.A.F. Hagborg).

FALSE STRIPE (virus) infection (3-tr. 3-mod.) was observed in fields of Compana barley in s. Alta. The mod. infected fields (25% of the plants showing symptoms) were all sown with seed from the same source (J.T.Slykhuis). False stripe was present in several varieties in the plots at Winnipeg and Brandon, Man; severe damage was noted in the progeny of a Vantage x Jet cross (W.A.F. Hagborg).

STREAK MOSAIC (virus) Sl. infections were observed in 4 fields located near wheat fields severely infected with wheat streak mosaic in s. Alta. (J.T.Slykhuis).

GREY SPECK (Manganese deficiency). A barley field w. of Spalding, Sask., across the road from an affected oat field was nearly as sev. affected as the latter (see above under Oats). The symptoms on barley are less conspicuous than on oats, but the plants were similarly stunted and although there was little spotting, long grey streaks were present at the margin of the leaves. Another barley field in the vicinity, which was broken up several years earlier than the field just described, was only mod. affected (T.C. Vanterpool).

WIND INJURY caused partial or complete blighting of the heads of some varieties in the plots at Morden, Man. (J.E. Machacek).

RYE

ERGOT (claviceps purpurea). A tr. was observed at Quill Lake, Sask., and affected heads received from Wynyard, where conidial exudate was reported to be abundant by the agricultural representative on 20 Aug. (T.C.Vanterpool). Infection was sl. in the rod rows at the Station, Fredericton, N.B. (J.L. Howatt), tr. in 3 fields in Annapolis and Kings counties, N.S. (D.W. Creelman) and sev. on rye plants growing in a field of barley at Charlottetown, P.E.I. Some ergot was also found on Agropyron repens (J.E. Campbell).

POWDERY MILDEW (Erysiphe graminis). Infection was 3-tr. 2-sl./8 fields examined in s. Alta.; not observed elsewhere in Alta. (W.P.C., J.S.H.). Mod. infection observed at La Trappe, Que., on winter rye in Nov. 1952 (Fr. M. Claude).

LEAF BLOTCH (Helminthosporium sativum). Infection was general, though usually sl. (tr.-50%), in the several fields of winter rye examined in Kings Co., N.S. (D.W. Creelman).

ROOT ROT (Helminthosporium sativum and Fusarium spp.). Damage was 12-tr. 13-sl./64 fields examined in Alta.; affected fields were scattered (W.P.C.,J.S.H.).

LEAF RUST (Puccinia secaline). Infection was sev. in one field near Creston, B.C., and was tr. in 3 others in s. Alta. (J.S.H.).

SCALD (Rhynchosporium secalis). Infection was 2-tr. 4-sl. 1-mod. /8 fields examined in s. Alta. (H.S.Horricks).

SPECKLED LEAF BLOTCH (Septoria secalis). Infection was 4-tr. 22-sl. 7-mod. 1-sev./64 fields examined in Alta., occurring chiefly in central and n. Alta. (W.P.C., J.S.H.).

STEM SMUT (Urocystis occulta). Infection was a tr. in one field in s. Alta. (J.S. Horricks) and 2% of the stems at Ladywood, Man. (W. Popp).

BACTERIAL BLIGHT (Xanthomonas translucens). A tr. infection observed in one field in s. Alta. (J.S.H.). Sl. infections were found at Douglas and Broomhill, Man. (W.A.F. Hagborg).

RUST NURSERIES IN CANADA IN 1953

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

In Report 5 issued by the Plant Pathology Laboratory, Winnipeg, Man., in November 1953, are recorded the observations on the occurrence of rusts and several other fungus diseases on varieties of wheat, oats, barley, and rye grown at 33 localities in Canada in 1953. The incidence of the various diseases on the different varieties in the nurseries is given in eight tables with a summary of the data in the ninth, which alone is here reproduced (Table 2).

Twelve varieties of wheat, eight of oats, five of barley were grown in the nurseries. The varieties were: Wheat - McMurachie, Lee, Carleton, Little Club, Marquis, Mindum, Thatcher, CT-186 (since named Selkirk), Norka, Redman, Exchange and Fontana; oats - Bond, Trispernia, Ajax, Vanguard, Garry, Clinton, Landhafer, and Canuck; barley - Montcalm, Wisconsin H. 106, Vantage, Peatland, and Univ. Manitoba 43-1020; and rye - Prolific.

Cereal Rusts in the Prairie Provinces in 1953

Wheat stem rust (Puccinia graminis var. tritici) was abundant in northern Mexico during the late winter and early spring of 1953. In the southern part of the Great Central Plains area, Texas and adjoining states, rust development was scanty owing to drouth conditions. However, in the northern part of the winter wheat belt and in the spring wheat region of the United States conditions were favourable for rust development and a heavy stem-rust infection was general on wheat throughout much of this region by mid-June. The northward spread of rust spores into Western Canada began early. A few spores were caught on the slides 25-28 May at Winnipeg, Morden, and Brandon in Man., and at Regina in Sask. Stem-rust spores began to appear in appreciable numbers on slides exposed in Western Canada about 18 June and from then until the end of the crop season rust inoculum wa abundant in the air over Man. and eastern Sask. Not since 1935 has there been so much rust inoculum in the air over this area. On a number of occasions several thousand spores per square inch were caught on slides during 72-hour exposures.