DISEASES OF CEREAL CROPS

WHEAT

LEAF SPOT (Ascochyta sorghi) was more prevalent than usual on spring wheat in s. Alta. (J.S.H.). Seven fields in w. and s.w. Sask. were affected; durum wheat at Leader was moderately infected, the 6 others showed tr. infections (R.D.T., B.J.s.)

DRY-SOIL MOLD (Aspergillus sp., Penicillium sp.). Moderately affected seedlings were received from Headingly, Man (W.A.F.H.).

BLACK POINT (Bipolaris sorokiniana). A specimen was received from Morrin, Alta. (A.W.H., D.S.). B. sorokiniana was isolated from the darkened peduncles of a specimen received from MacGregor, Man. Some of the plants submitted had died prematurely (w.A.F.H.).

COMMON ROOT ROT (Bipolaris sorokinana, Fusarium spp.) caused considerable damage at Amisk, Fabyan, and Blue Ridge and lighter damage at Neerlandia, Twin Butte and Vermilion, Alta. (A.W.H., D.S.). Two fields at Benalta in c. Alta. suffered 30% damage (B.B.). It was rated 13-tr. 11-sl. 5-mod. in winter wheat fields in s. Alta. (J.S.H.). Field ratings of common root rot in Sask. averaged 13.5, the highest level reached since 1951. The average ratings over the past 23 years have shown two periods of upward trends separated by a reverse trend. Ratings rose from 6.0 in 1942 to 13.7 in 1951, fell to 7.5 in the very favorable crop year of 1952 and again in 1955; then rose to its present level of 13.5. The 1964 ratings for crop districts 1 to 9 were, respectively, 14.2, 11.5, 17.0, 13.4, 14.3, 17.2, 9.0, 13.8 and 9.0. June rainfall in crop districts 3 and 6, with the highest disease ratings, was much below normal. It was also well below normal in crop district 8 where common root rot was considerably higher than usual. The low ratings in crop districts 7 and 9 in n.w. Sask. were related to better than average moisture conditions in June (B.J.s.). It was rated 8-tr. 6-sl. 1-mod./22 fields surveyed in Lincoln and Welland Counties, Ont. (T.R.D.)

ERGOT (Claviceps purpurea). Specimens were received from Grande Prairie and Belloy, Alta. (A.W.H., D.S.). Trace infections were noted at Crooked River and Englefeld, Sask. (R.J.L.). Distinct mottled-brown to dark discolorations occurred on the lemmas of florets infected with the sphacelial stage of ergot at Parkdale, Man. (W.A.F.H.).

POWDERY MILDEW (Erysiphe graminis) was rated 2-tr. 9-sl./30 fields surveyed in n. & c. Alta. It was fairly extensive at Spirit River (w.P.s., A.w.H.). It was tr. in 1 winter wheat field in s. Alta. (J.S.H.). It was rated 1-tr. 4-sl. 4-mod./22 fields surveyed in Lincoln and Welland Counties, Ont. (T.R.D.). Infection was sl. and not as heavy as in 1963 in e. Ont. (R.V.C.).

SCAB (Gibberella zeae) was unusually prevalent in the Peace River district of Alta. It was rated 5-sl./15 fields surveyed (W.P.S.). A specimen was received from Wanham, Alta. (A.W.H., D.S.). Infection was variable, averaging 1% at St. Francois Xavier and Rosser, Man. (H.A.H.W.).

TAKE-ALL (Ophiobolus graminis) was mod.-sev. at Amisk and was identified in specimens received from Alhambra and Dewberry, Alta. (A.W.H., D.S.). It was 1-tr./224 fields surveyed in Sask. (B.J.S.) and 1-sl./22 fields visited in Lincoln and Welland Counties, Ont. (T.R.D.).

ROOT ROT (Plenodomus sp.) caused 5% damage to winter wheat in experimental plots at Lacombe, Alta. in May. (A.W.H., B.B.).

BASAL GLUME ROT (Pseudomonas atrofaciens) caused mod. damage in 3/15 fields surveyed in the Peace River district of Alta. (W.P.S.). Specimens were received from Fairview, Ponoka and Woking, Alta. (A.W.H.). One field at Hirsch, Sask. had 20% of the heads affected. A sl. infection also occurred at Alameda (B.J.S.). An outbreak of basal glume rot occurred in s.e. Sask and w. Man. resulting in bacterial black tip in the kernels. Infections ranged as high as 21% and were suspected of lowering grades of wheat. However, much of the low-grade wheat resulted from frost damage (w.A.F.H.) (see under 'Frost Injury' below (D.W. Creelman).

STEM RUST (Puccinia graminis) was rated 19-tr. 4-sl./244 fields visited in Sask. (B.J.S.). It was 6-sl. 6-mod. 10-sev./

* See Appendix "A" for list of contributors, their addresses and affiliation.

22 fields surveyed in Lincoln and Welland Counties, Ont. (T.R.D.). Trace infection was seen in a small plot at La Pocatibre, Que. (H.G.). Infections were generally only tr. but were sev. in a few areas in e. Ont. (R.V.C.).

"LEAFRUST (Puccinia recondita) was 5-sl./30 fields surveyed in n. and c. Alta. (W.P.S.). Infections of bread wheat in Sask. were rated 75-tr. 31-sl. 24-mod. 19 sev./212 fields surveyed. Traces were recorded in 2/28 fields of durum wheat. Severe infections of bread wheat occurred se. of a line through Weyburn, Melville and Kamsack. Traces occurred w. of a line through Moose Jaw, Saskatoon and Nipawin (B.J.S.). It was rated 2-tr. 6-sl. 11-mod. 3-sev./22 fields in Lincoln and Welland Counties, Ont. (T.R.D.) and was tr. only in e. Ont. (R.V.C.).

STRIPE RUST (Puccinia striiformis) was unusually prevalent on winter wheat in the s. w. corner of Alta. during the fall of 1963 but was not common in 1964. Despite an unusually mild winter there was only one instance where there was any suspicion that the rust might have overwintered in the area (T.G.A., M.N.G.).

BROWNING ROOT ROT (Pythium graminicola Subram. (P. errhenomanes Drechsl.). Two fields at Kinley, Sask. were moderately affected (B.J.s.).

SPECKLED LEAF BLOTCH (Septoria spp.) was rated 14-tr. 31-sl. 7-mod. 5-sev./ 244 fields surveyed in Sask. (R.D.T., B.J.S.).

GLUME BLOTCH (Septoria nodorum). Infections were 12-sl. 8-mod./30 fields visited in n. and c. Alta. (W.P.S.). Specimens were received from Fairview, where it was abundant, Claresholm, Grande Prairie, Topland, Vermilion, Wanham and Woking, Alta. (A.W.H., D.S.). Ratings in Sask. were 2-tr. 7-sl. 2-mod. 1-sev./224 fields. The disease occurred in the e. half of the province (B.J.S.).

COMMON BUNT (Tilletia caries, T. foetida) was fairly abundant on a specimen from Mellowdale, Alta. (A.W.H., D.S.) and was 2-tr./30 winter wheat fields in s. Alta. (J.S.H.). Bunt was present in plots at La Pocatikre, Que. (H.G).

LOOSE SMUT (Ustilago tritici) was found in Sask. only in durum and the bread variety 'Lee'. The average percentage in 29 fields of durum was 0.42. All 3 fields of 'Lee' examined were infected with an average of 2% loose smut (B.J.S.). Twenty-five/35 fields of durum examined in Man. were affected. Infections ranged up to 9% with a mean of 1.5%. All 46 fields of common wheat examined were free of loose smut (J.J.N.). It was mod. in a plot at La Pocatibre, Que. (D.L.).

BACTERIAL BLACK CHAFF (Xanthomonas translucens). A specimen was received from Frobisher, Sask. (B.J.S.).

AGROPYRON MOSAIC (agropyron mosaic virus). In some winter wheat fields in York, Simcoe, Huron, Middlesex and Perth Counties, Ont., 75-100% of the plants at the borders of fields near diseased Agropyron repens were affected. Higher than normal fall temperatures favored its spread to wheat (J.T.s.).

ASTER YELLOWS (aster yellows vim). Infected plants observed in experimental plots of durum wheat at 2 locations in Man. AYV was recovered from them by leafhopper transmission (C.C.G.)

BARLEY YELLOW DWARF (barley yellow dwarf virus). A trace infection occurred at Evesham, Sask. (R.D.T.). Infection was rated 4-tr. 5-sl. 1-mod./15 fields surveyed in Man. (C.C.G.).

SOIL-BORNE MOSAIC (virus). Incidence in York, Simcoe, Huron, Middlesex and Perth Counties, Ont. was very low in winter wheat fields where the disease was common in other years. Higher than normal soil temperatures in the fall of 1963 were probably responsible for the low incidence (J.T.S.).

WHEAT SPOT MOSAIC (wheat spot mosaic virus). This virus, isolated repeatedly between 1952 and 1955 and not encountered since, was isolated from wheat in Alta. in 1964 by T.G.Atkinson (J.T.S.) .

WHEAT STREAK MOSAIC (wheat streak mosaic virus). Severe damage was observed in the vicinities of Lethbridge, Magrath and welling., Alta. (A.W.H. , D.S.) . It was general on winter wheat in the fall of 1963 in the e. half of the winter wheat area of s. Alta. (C.P.D.S. 43: 154-159. 1963) and many severely diseased fields were cultivated out in the spring of 1964. However, the cool, moist spring was most favorable for wheat growth and appeared to be particularly unfavorable for disease expression and multiplication and spread of the vector. As a consequence, losses were minimized and satisfactory yields were obtained from many fields that would have been severely affected under circumstances more favorable for disease development. In a few cases losses were sustained on spring wheat crops adjacent to diseased winter wheat (T.G.A., M.N.G.). WSMV waa isolated and identified from winter wheat in a field nr. Clandeboye,

"For a more complete review of the prevalence and importance of the cereal rusts in 1964, see Can. Plant Dis. Survey 45: 13-32. 1965.

Middlesex Co., Ont. This is the first known record of this virus in Ont. (J.T.S.).

WHEAT STRIATE MOSAIC (wheat striate mosaic virus) occurred as trace infections at Kindersley and Lemsford, Sask. (R.D.T.). About 10% of the numerous fields examined in Man. showed tr. infections (C.C.G.).

SPLOTCH (physiological) was rated 3-tr. 3-sl.. 1-mod. 1-sev./29 fields of durum wheat examined in Sask. (R.D.T., B.J.S.).

BRITTLE DWARF (aphid injury). A few plants in experimental plots near grass roadways at Saskatoon, Sask. were affected (B.J.S.).

CHEMICAL INJURY (herbicides). Considerable damage was noted in fields at Regina, Weyburn and Yorkton, Sask. (B.J.S.).

CHLOROTIC LEAF BANDING (high temperatures). Specimens were received from Bloomsbury, Derwent and Vegreville, Alta. (A.W.H., D.S.). It occurred at Webb (B.J.S.) and severely damaged seedlings were received for diagnosis from Englefeld, Sask. (W.A.F.H.).

FROST INJURY. Seed submitted from Yarbo, Sask. showed typical frost damage (R.J.L.). In 12 samples of wheat received from s.e. Sask. the principal cause of a very low grade (#6) was frost damage. From meteorological records and farm service reports the damage was shown to be caused by frosts occurring in the week ending Aug. 17. Frost was reported during that period from Broadview, Ceylon, Francis, Lipton, Melville and Minton in the area from which the samples were received (W.A.F.H.).

HEAD DISCOLORATION (physiological melanism) occurred in tr.-sl. amounts in the vicinity of Winnipeg, at Portage la Prairie, Holland and Dauphin, Man. Isolations yielded either no organism or Alternaria tenuis. A single collection from Oakburn, Man. yielded A. tenuis and Nigrospora sp. (W.A.F.H.).

STEM BREAK (2,4-D injury and wind) caused 10% damage in several fields nr. Young, Sask. Fields were sprayed late, apparently causing elongation of the upper node at which point plants collapsed in high winds (R.D.T.).

WEED STAIN. Wheat kernels received from Stewart Valley, Sask. showed irregular black stains occurring randomly over the surface. These stains were attributed to Russian thistle fragments, the sample having been exposed to a light rain (B.J.s.)

OATS

ANTHRACNOSE (Colletotrichum graminicola) caused 5% damage in 1/9 fields surveyed in the Peace River district of Alta. and B.C. (B.B.). It was sev. on late plantings at Ste. Petronille and Ste. Famille, Montmorency Co. and at Deschambault, Portneuf Co., Que. (D.L.).

LEAF BLOTCH (Drechslera avenacea). The pathogen was isolated from heavily infected specimens from the Willingdon district, Alta. (A.W.H., D.S.). Infection was mod. on 'Scotia' oats at Nappan. N.S. (C.O.G.).

ROOT ROT (Fusarium culmorum) was mod. in a field at Broderick, Sask. and 10% of the plants were killed in a plot at Saskatoon. No infection was seen in 25 other fields visited (R.J.L., B.J.S.). 'Scotia' had 1% infection at Nappan, N.S. (C.O.G.).

GLUME AND STEM BLIGHT (Fusarium sp.) was mod. on the basal portion of glumes and on stems, particularly near the nodes, at Nicolet, Que. (D.L., M.F.).

HALO BLIGHT (Pseudomonas coronafaciens). An infection of 8% was reported nr. Calgary, Alta. (A.W.H., D.S.). It was rated 1-tr. 6-sl./26 fields surveyed in Sask. (B.J.S.). It was found in 4/4 fields observed in Man. In the most severely affected field the mean loss of leaf area was estimated at 5% (W.A.F.H.). Ratings were 7-tr. 1-sl./11 fields surveyed in Lincoln and Welland Counties, Ont. (T.R.D.).

STRIPE BLIGHT (Pseudomonas striafaciens) was sev. on an oat cover crop at the Research Station, Lethbridge, Alta. in Oct. (T.G.A.)

CROWN RUST (Puccinia coronata). In w. Canada, damaging infections were confined to the Red River Valley in Man. where intensities of 20-40% were recorded in mid.-Aug. Crown rust infections were generally ltight n. of the Trans-Canada Highway, rarely reaching 10%. Trace amounts only occurred in Sask. (G.F.). It was present, at maturity, in all areas surveyed in e. Ont. (R.V.C.). Infection was recorded in 9/17 Quebec Seed Board variety plots. Based on a maximum figure of 10, four of the plots had significant infections in the following ratios: La Pocatière, 5.00; Riviere Ouelle, 2.66; St. Flavien, 2.33 and Thetford Mines, 1.66 (D.L., M.F.).

STEM RUST (Puccinia graminis) was rated 3-tr. 1-sl./29 fields surveyed in Sask. (B.J.S.).

LEAF RUST (Puccinia recondita). Infections in Sask. were 1-tr. 2-sl./29 fields (B.J.S.). It was found in all areas of e. Ont. at maturity (R.V.C.).

SPECKLED LEAF BLOTCH (Septoria avenae f. sp. avenae). Trace infections occurred in 2/26 fields examined in Sask. (R.D.T.). It appeared late in e. Ont. but became ex-

tremely heavy (R.V.C.). It was trace on 'Scotia' oats at Nappan, N.S. (C.O.G.) and mod.-sev. on 'Fundy' in plots at St. John's West, Nfld. (G.A.N.).

LOOSE SMUT (Ustilago avenae). Neither loose nor covered smut were found in 48 fields examined in Man. (J.J.N.). Loose smut infection was 3% in 1/7 fields examined in N.B. (S.R.C.).

RED LEAF (barley yellow dwarf virus) was general in s. Alta. but damage was only slight (T.G.A.). Traces were seen at Whitewood and Cudworth, Sask. (R. J.L., B. J.S.). Incidence was usually light in e. Ont but it was extremely heavy in the Kapuskasing and New Liskeard areas (R.V.C.). It was widespread in Man. and fields as far n. as The Pas were infected. It was rated as 11-tr. 5-81. 7-mod. 1-sev./27 fields surveyed (C.C.G.). It was feared early in the summer that large acreages of grains in Carleton Co., N.B. were infected with BYDV. Heavy aphid populations were found in grain fields. The symptoms, however, could not be aphid-transmitted to healthy seedlings and similar symptoms were obtained with the feeding of moderately heavy populations of non-viruliferous aphids. Plants in affected fields recovered considerably during the latter part of the season but yields were reduced by almost half (T. C.C., S.R.C.).

BLUE DWARF (oat blue dwarf virus) was observed in an oat nursery nr. Winnipeg, Man. Experimental transmission was obtained from oats to barley, flax and oats by the six-spottea leafhopper (C.C.G.). This is the first report, to the Survey, of the occurrence of this disease in Canada (D.W. Creelman).

BLAST (physiological). A field with 75% of the heads affected was reported at Barrhead and less severely affected ones at Edmonton and Grande Prairie, Alta. (A.W.H., D.S.). It was present to a slight degree in most oat fields visited in Sask. (B.J.S.). Blast was rated 8-tr. 3-sl./11 fields surveyed in the Vineland-St. Catharines area, Ont. (T.R.D.).

GRAY SPECK (manganese deficiency). Specimens were received from Crooked Creek, Alta. (A.W.H., D.S.). It was rated 1-sl. 3-mod. 1-sev./9 fields in the w. part of c. Alta. and 3-tr. 2-sl. 2-mod./9 fields in the Peace River district (B.B.).

NUTRIENT DEFICIENCY (probably potassium deficiency) affected large patches in fields at Lotbiniere, Ste. Claire, Ste. Sabine, and Notre Dame du Lac, Que. It was probably aggravated by generally poor weather conditions (D.L.).

BARLEY

SPOT BLOTCH (Bipolaris sorokinana) was rated 1-tr. 2-sl./33 fields surveyed in Sask. (R.J.L., B.J.S.). Infection was mod.-sev. on 6-row barleys in 8 fields between St. Francois Xavier and High Bluff, Man. (H.A.H.w.). 'Charlottetown 80' was 10% infected at Nappan, N.S. (C.O.G.) and infection was mod.-sev. on 'Vantage', 'Parkland' and 'Montcalm' in plots at St. John's West, Nfld. (G.A.N.).

COMMON ROOT ROT (Bipolaris sorokiniana, Fusarium spp.). The average rating in 33 Sask. fields was 15.3, somewhat higher than in 1963 (B.J.S.). It was sev. in patches on 6-row barley at Rosser, Man. (H.A.H.W.). Infection was general but slight on 'Herta' in P.E.I. (C.B.W.).

NET BLOTCH (Drechslera teres) was rated 8-sl. 10-mod. 12-sev./41 fields examined in n. and c. Alta. (W.P.S.). Reports from Airdrie, Calgary, Enilda, Grimshaw, Standard, Sylvan Lake and Rockyford, Alta. indicated infections ranging from 15-100% (A.W.H., D.S.). Ratings were 3-sl. 15-mod./21 fields surveyed in the Peace River district of B.C. and Alta.; it was mod. in 4/9 fields at Bonnyville; in 4/8 fields in c. Alta. and tr.-mod. in 2/6 fields at Myrnam, Alta. (B.B.). Ratings in Sask. were 6-tr. 13-sl. 6-mod. 1-sev./33 fields examined (R. D. T., B. J.S.).

SCAB (Fusarium sp.). A specimen received from Ardmore, Alta. contained 0.2% pinkish kernels bearing conidia of the causal fungus (A.W.H., D.S.).

STEM RUST (Puccinia graminis) was 4-tr./33 fields examined in Sask. (B.J.S.). It was found in 7/15 Quebec Seed Board plots with notable infections occurring at Honfleur, Bellechasse Co. and at St. Hyacinthe (D.L., M.F.).

LEAF RUST (Puccinia hordei) was observed in 11/15 Quebec Seed Board plots. Taking maximum infection as 10, the ratios in the most notably infected plots were: Honfleur, 4.86; La Pocatiere, 3.71; St. Gedeon, 3.71; St. Hyacinthe, 3.00; Normandin, 2.57; Thetford Mines, 2.29 (D.L., M.F.). Infection was 1% on 'Charlottetown 80' at Nappan, N.S. (C.O.G.).

SCALD (Rhynchosporium secalis). Infections in n. and c. Alta. were rated 6-sl. 3-mod. 4-sev./41 fields examined in contrast to its rare appearance in 1963. (W.P.S.). It was reported as sev. in a field at Stony Plain, fairly extensive at Millet, Airdrie and Calgary, abundant at Grimshaw and mod. at Fort Saskatchewan and Strathcona, Alta. (A.W.H., D.S.). Ratings

were 5-sl. 4-mod. 7-sev./21 fields surveyed in the Peace River district of B.C. and Alta. and 2-tr. 1-sl. 2-sev./8 fields in c. Alta. where average damage was between 5 and 10% (B.B.). Scald was slight at Regina, Sask. (B.J.S.).

SPECKLED LEAF BLOTCH (Septoria passerinii) was slight in 1 field at Bishopric out of 33 surveyed in Sask. (R.D.T.). It was tr. on 'Charlottetown 80' at Nappan, N.S. (C.O.G.).

COVERED SMUT (Ustilago hordei). Infections were rated 4-tr. 3-2% 1-3%/32 fields surveyed in Sask. The average infection was 0.31%. A specimen was also received from Stenen, Sask. (B.J.S., R.J.L.). Four/51 fields examined in Man. had infections ranging up to 5% with a mean at 0.2% (J.J.N.).

LOOSE SMUT (Ustilago nuda, U. nigra). A specimen of U. nuda was received from Thorsby, Alta. (A.W.H., D.S.). Nine/32 fields examined in Sask. had 4-tr., 1, 2, 3, 6 and 8% infection with an average of 0.66% (B.J.S.). U. nuda was found in 18/51 fields in Man with infections ranging up to 8% and a mean of 0.6% while U. nigra occurred in 16/51 fields with infections up to 4% and a mean at 0.6% (J.J.N.). The variety 'Charlottetown 80' carried tr. infection at Nappan, N.S. and 'Vantage' less than 1% at St. John's West, Nfld. (G.A.N.)

BACTERIAL BLIGHT (Xanthomonas translucens) was rated 4-91. 5-mod./41 fields surveyed in n. and c. Alta. (W.P.S.). A mod. infection was seen at Eastend, Sask. (R.D.T.).

ASTER YELLOWS (aster yellows virus) was found in 18/20 fields examined in Man. Infection in farmers' fields ranged from tr.-4.3%. The highest rate of infection in experimental plots was 5% on 'Parkland' barley (C.C.G.).

BARLEY STRIPE MOSAIC (barley stripe mosaic virus) was trace in one and mod. in another experimental plot in Man. None was seen in farmers' fields (c.c.G.).

YELLOW DWARF (barley yellow dwarf virus) was trace at Kindersley, Sask. (R.D.T.). Trace infections were found in about half the fields surveyed in Man. Infection was sev. in one late-sown field. Symptoms were often difficult to distinguish from those caused by aster yellows virus (C.C.G.).

CHLOROTIC LEAF BANDING (high temperature). Specimens were received from Brownville, Edmonton and Pibroch, Alta. At Brownville, 10-30% of the seedlings were affected (A.W.H., D.S.).

RYE

STEM RUST (Puccinia graminis). Infection was slight at Virgil, Ont. (T.R.D.).

LEAF RUST (Puccinia recondita) caused slight damage to the varieties 'Tetrapetkus' and 'Prolific' at St. John's West, Nfld. (G.A.N.).

ERGOT (Claviceps purpurea). Infection was sl.-mod. in all rye fields in the La Pocatière region, Que. (H.G.).

DISEASES OF FORAGE AND FIELD CROPS

A. Forage Legumes

ALFALFA

BLACK STEM (Ascochyta imperfecta). Infection was 40% at Milo, fairly extensive at Spirit River and observed at Camp Creek, Alta. (A.W.H., D.S.). It was mod. at Regina and at Nipawin, Sask. (B.J.S., R.D.T.).

LEAF SPOT (Ascochyta imperfecta) was observed at Fort Vermilion, Alta. (A.W.H., D.S.).

SNOW MOLD (low-temperature basidiomycete). Ratings were 4-tr. 12-sl. 8-mod. 4-sev./28 fields surveyed in the Edmonton, Alta. area (E.J.H.).

BACTERIAL WILT (Corynebacterium insidiosum). Infections were 9-tr.-sl. 44-tr.-mod. 22-tr.-sev./86 fields examined in s. Alta. (E.J.H.).

STEM NEMATODE (Ditylenchus dipsaci) was rated 11-tr.-sev./86 fields in s. Alta. (E.J.H.).

CROWN BUD ROT (Fusarium spp., Rhizoctonia solani, Ascochyta imperfecta) was observed at Gibbons (A.W.H., D.S.) and was general in s. Alta. in irrigated alfalfa fields more than 1-year old. Ratings were 22-tr.-sl. 49-tr.-mod. 8-tr.-sev./86 fields surveyed (E.J.H.)