1. DISEASES OF CEREAL CROPS

WHEAT

LEAF SPOT (Ascochyta sorghi) affected 10/20 spring wheat fields in s. Alta. ; 6-tr. 1-sl. 2-mod. 1-sev. Infection was mod. on Thatcher near Coutts (J. S, Horricks, T. G. Atkinson),

COMMON ROOT ROT (*Bipolaris sorokiniana and Fusarium spp.) was 7-tr. 5-sl./14 winter wheat fields at Creston, B.C. (J. S. H.); it was 6-tr. 7-sl. 2-mod./17 n, Alta fields (W, P. Campbell), 10-tr. 7-sl. 3-mod. /20 in spring wheat and 15-tr. 24-sl. 8-mod. 7-sev. /54 in winter wheat in s. Alta, (J,S. H, and T. G. A,). Common root rot was relatively light in the n. , n. -e, and e, parts of Sask. and relatively sev. in the c., s., and w. areas. Average disease ratings for crop districts 1-3 arid 5-9 were: 8.35, 9-60, 12.29, 6 53, 10.52, 11.96, 3.95 and 6.26 respectively. Estimates of wheat yields in the respective districts were: 15. 7, 12. 5, 11.2, 24.5, 15.9, 12, 7, 25.3 and 16.2 bu. /ac. The average disease rating for the province was 9.14 (B. J. Sallans).

LEAF BLIGHT (*Drechslera tritici-repentis) was 1-tr./54 winter wheat fields in s. Alta, (J. S. H.).

POWDERY MILDEW (Erysiphe graminis) occurred as 1-tr. 1-mod. /20 spring wheat and 2-tr, 1-sl. /54 winter wheat fields in s. Alta, (J. S. H.).

HEAD BLIGHT (Fusarium spp,). Specimens of Mindum wheat from Normandin, Que, were lightly infected by F. avenaceum. Marquis wheat from Charlottetown, P. E, I. was similiarly slightly infected by F, graminearum (W, L. Gordon).

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*In a recent paper, (Can, J. Botany, 37, 879-887 (1959), R.A. Shoemaker proposed certain changes in the nomenclature of some graminicolous fungi formerly classed in the genus Helminthosporium. He took up the generic name Drechslera, proposed by Ito in 1930, for those species with cylindric conidia that germinate from all cells. For the other major group of graminicolous species with fusoid phragmospores that exhibit biopolar germination, he proposed the genkric name Bipolaris. The ascigerous stages of species af Drechslera, where known, are in the genus Pyrenophora, Those of Bipolaris species are in Cochliobolus. The nomenclature proposed by Shoemaker is followed in this issue of the Survey (D. W. Creelman),

TAKE-ALL (Ophiobolus graminis) was 3-tr./14 fields at Creston, B.C. (J.S.H.). It was 1-tr. 1-sl./17 in n. Alta, (W.P.C.), and 2-tr./54 winter wheat fields in s. Alta. (J.S.H.).

STEM RUST (Puccinia graminis). At Creston, B.C. stem rust was 2-tr./14 winter wheat fields. It was 2-tr./20 spring wheat and 7-tr./54 winter wheat fields in s. Alta. (J.S.H.). Tr. infections were found in 2 fields in s.-e. Sask. late in the growing season (B.J.S.).

LEAF RUST (Puccinia recondita = P. triticina) affected 7/14 winter wheat fields at Creston, B.C., 4-sl. 1-mod. 2-sev. It was 1-tr./20 in spring wheat and 1-tr./54 in winter wheat fields in s. Alta. (J.S.H.). Leaf rust was found in 105/174 fields surveyed in Sask. It was sev. in local areas in the e. and n.-e. parts of the province from Yorkton to Nipawin and Prince Albert. Tr.-sl. infections were common in the central areas and most fields were free from leaf rust in w. and s. Sask. (B.J.S.). In the Rust Nurseries at Charlottetown, P.E.I. it was observed on the varieties McMurachy, Lee, Kenya Farmer, Marquis, Mindum, Thatcher, Selkirk, Canthatch, Exchange and Pembina. Infection ranged from tr, -60% (J.E. Campbell).

STRIPE RUST (Puccinia striiformis = P. glumarum) was 3-sl. 1-mod. 1-sev./14 winter wheat fields at Creston, B.C. (J.S.H.).

BROWINO ROOT ROT (Pythium arrhenomanes). Specimens from Eston and Leney, Sask. were received at Saskatoon (B.J.S.).

GLUME BLOTCH (Septoria nodorum). Low-lying areas of 1 field near Vulcan, Alta., showed sev. infections (J.S.H.). Two fields at Elstow, Sask., had tr.-sl. infections (B.J.S.).

SPECKLED LEAF BLOTCH (Septoria spp.). At Creston, B.C. infection was 1-tr. 3-sl. 2-mod./20 winter wheat fields (J.S.H.). Three/17 n. Alta, fields were affected, 2-tr. 1-sl. (W.P.C.). In s. Alta. it was 3-tr./20 spring wheat and 1-tr. 2-sl./54 winter wheat fields (J.S.H.). Tr. infections at Francis and Whitewood and sl. infections at Carlyle and Kincaid were seen in Sask. (B.J.S.). It was sl. in the Rust Nurseries at Charlottetown, P.E.I. (J.E.C.).

COMMON BUNT (Tilletia caries and T. foetida) was found in 9/54 winter wheat fields in s. Alta. Five-tr. 3-1%, 1-2% (J.S.H.). It was seen in only 1/177 fields examined in Sask. (R.C. Russell).

DWARF BUNT (Tilletia contraversa) was 6-tr. 1-5%, 1-10%, 1-15%/20 winter wheat fields at Creston, B.C. It was 3-tr./54 s. Alta, fields (J.S.H.).

LOOSE SMUT (Ustilago tritici) Eleven/14 fields examined at Creston, B.C. showed tr. infections (J.S.H.). It was 5-tr. 1-sl./177 fields in Sask. Several of the affected fields were durum wheat. Loose smut was less prevalent than usual in Sask, (R, C.R.).

BACTERIAL BLACK CHAFF (Xanthomonas translucens) was 1-tr./20 spring wheat fields in s. Alta, (J.S.H.). About 25% of the leaf area of 10% of the plants was destroyed in a field near St. Norbert, Man. Infection apparently followed hail damage (W, A, F, Hagborg),

WHEAT STREAK MOSAIC (virus). In s. Alta, it was 1-tr./20 spring wheat and 1-tr, 1-sev./54 winter wheat fields (J.S.H.)

CHLOROTIC LEAF BANDING (high soil-surface temperatures) was seen early in June at Wynyard, Indian Head, Kamsack and Saltcoats in Sask. Conditions were favorable for this disorder in 1959 (T.C. Vanterpool). Specimens from Antler and Kipling, Sask. were examined (B,J.S.).

NECROTIC SPOT (cause unknown). More than 40% of the leaf area of all the plants of the variety Israeli 676 was destroyed in the World Wheat Collection at Winnipeg, Man. The condition was also sev. on Cyprus 591 (W.A.F.H.).

LEAF BLOTCH (physiological) was tr. on durum wheat varieties at Carlyle and Francis and mod. on 50% of the plants at Q'Appelle, Sask, It was sl, -mod, on varieties at Indian Head (B.J,S.).

SEED STAIN:" Sap from Russian Thistle seed caused some staining of wheat from the 1958 crop at Odessa, Sask, (T.C.V.). (see C.P.D.S. Ann. Rep't, 20:10, 1940 [1941]. (D,W, Creelman),

LOW GERMINATION: Mechanically injured seed sown in dry soil at Weyburn, Sask., became infected with Penicillium spp, Germination was greatly reduced (T.C.V.).

CHEMICAL INJURY, Mod. damage from 2,4-D was seen in 1 field at Elrose and in 1 at Stonehenge, Sask. (B.J.S.).

OATS

BLACK MOLD (Alternaria spp., Cladosporium spp.). Infected samples were received from Stockholm, Sask. (T, C, Vanterpool).

TWIST (Dilophospora alopecuri), A sl. infection was seen in Fundy oats on the Experimental Farm at St. Charles de Caplan, Que. (D, Leblond). This disease has apparently not been previously reported on oats. Sprague (Diseases

of Grasses and Cereals in North America, 538 pp. 1950) lists barley, rye and wheat among the hosts bat states (p. 169) that it is not of economic importance. It has been reported (C.P.D.S. Ann. Rep't. 5:17, 1924 [1925]) on barley at Carlyle, Sask. and also (C.P.D.S. Ann. Rep'ts. 16, 17, 25 and 30) on Holcus lanatus from Vancouver Island and the Fraser Valley in B.C. Specimens on both hosts are deposited in DAOM (D. W. Creelman),

ROOT ROT (Fusarium spp.). Infections were 4-tr. 2-sl./79 fields in n. Alta. (W.P. Campbell).

HALO BLIGHT (Pseudomonas coronafaciens). A specimen was seen from Melfort, Sask. (B.J, Sallans),

BACTERIAL SPOTTING (Pseudomonas spp.) followed hail damage in some fields in the Winnipeg, Rosser and Carman areas of Man, in June. Leaf area destruction ranged up to 30% (W.A.F. Hagborg),

CROWN RUST (Puccinia coronata) occurred as tr, -sl. infections in the eastern counties of P.E.I. It was also present in the Rust Nurseries at Charlottetown (J.E. Campbell),

STEM RUST (Puccinia graminis). The varieties Bond, Trispermia, Exeter, Clinton and Landhafer were affected in the Rust Nurseries at Charlottetown, P.E.I. Infection ranged from tr, -60% (J.E.C.).

SPECKLED LEAF BLOTCH (Septoria avenae), Trace infections were seen at McLean and Whitewood, Sask. (B,J.S.). The disease was quite general throughout P,E.I. Infections were severe and considerable damage resulted, It was also present on practically all the oat varieties in the Rust Nurseries at Charlottetown (J.E.C.).

SMUTS (Ustilage avanae and U, kolleri). Neither loose nor covered smut was encountered in 9 fields surveyed in Sask, (R.C. Russell). In n, Alta, combined readings were 3-tr. 1-5%, 1-8%, 1-15%, 1-18%/79 fields (W.P.C.).

RED LEAF (virus), Trace - sl. infections were seen in experimental plantings at Ste, Anne de la Pocatière, Que. (R.O. Lachance).

GRAY SPECK (Manganese deficiency) was 9-tr. 12-sl. 3-mod. 5-sev, /76 fields in n. Alta, It was sev. in many poorly drained fields in the Edmonton area (W.P.C.).

BLAST (physiological) affected 43/76 n. Alta, fields, 16-tr. 18-sl. 5-mod. 4-sev. (W.P.C.).

CHLOROTIC LEAF BANDING (high soil-surface temperatures) was observed at Indian Head, Sask, This disorder is not common on oats (T.C. Vanterpool).

BARLEY

Manitoba Barley Disease Survey - 1959

H. A. H. Wallace

A survey was made of 75 barley fields in southern Manitoba. Due to the wet season leaf and stem rusts and mildew were much more prevalent in this area in late ripening fields than is usually the case. They were absent in early ripening fields. Most of the stem rust infection occurred on Montcalm, the mildew on Parkland, and leaf rust on both varieties. Bacterial blight was not seen in farmers' fields but was severe on early ripening varieties of barley in experimental plots at Winnipeg. Table 1 shows the relative importance of each disease, Smuts were not recorded.

Table 1. Manitoba Barley Disease Survey - 1959

Disease	Amount of Infection (75 fields)			
	Trace	Light	Moderate	Severe
Net Blotch *(D. teres)	15	10	19	21
Spot Blotch *(B. sorokiniana)	19	1	2	0
Speckled Leaf Blotch (Septoria passerinii)	7	2	4	1
Powdery Mildew (Erysiphe graminis)	2	3	3	1
Leaf Rust (Puccinia hordei)	7	14	6	3
Stem Rust (Puccinia graminis)	12	7	8	2
Yellow Dwarf (Virus)	1	0	1	0
False Stripe (Virus)	1	0	0	0

* See footnote, page 1 (D. W. C.).

SPOT BLOTCH (*Bipolaris sorokiniana) was recorded as 2-tr. /8 s. Alta, fields (J.S. Horricks). It was sl. in Rust Nurseries at Charlottetown, P. E.I. (J.E, Campbell).

COMMON ROOT ROT (*Bipolaris sorokiniana and Fusarium spp.). In n, Alta, 30/38 fields surveyed were affected, 14-tr. 13-sl. 3-mod. (W.P. Campbell). All 8 fields examined in s. Alta, had root rot, 2-tr. 6-sl. (J.S.H.). Thirteen fields surveyed in Sask, had an average root rot rating of 11.45. This rating, as usual, was higher than that observed for wheat (B.J. Sallans).

NET BLOTCH (*Drechslera teres) was 7-tr./38 fields in n. Alta. (W.P.C.). It was 5-tr./8 in s. Alta. (J.S.H.), and tr, at Watrous, Holdfast and Regina, mod. at Leross and Annaheim; and sev, at Meadow Lake and Waldron in Sask. (B. J. S.).

STEM RUST (Puccinia graminis). Traces of stem rust were seen at Regina, Waldron and Saskatoon, Sask. (B, J. S.).

LEAF RUST (Puccinia hordei). Trace - sl. infections were present at Watrous and Saskatoon, Sask. by mid-August (B. J, S.).

SCALD (Rhynchosporium secalis) was 7-tr. 4-sl. 3-mod. 2-sev./38 fields surveyed in northern B.C. and n. Alta. The mod-sev, infections were in the Dawson Creek, B.C. area (W.P.C.). A trace was found in 1/8 fields seen in s. Alta. (J.S.H.).

SPECKLED LEAF BLOTCH (Septoria passerinii). Twelve138 n. Alta. fields were diseased, 8-tr. 3-sl. 1-mod. (W.P.C.). In s. Alta. it was 1-tr./8 (J.S.H.).

COVERED SMUT (Ustilago hordei) was 1-tr./8 in s. Alta. (J.S.H.). Traces were found in 3/21 fields examined in Sask, (R.C. Russell).

LOOSE SMUT (Ustilago nuda and U. nigra). Eleven/38 fields examined in n, Alta. had loose smut, 8-tr. 2-1%, 1-2% (W.P.C.). One field/8 in s. Alta, showed a trace (J.S.H.). In Sask., 15/21 fields surveyed were affected. The percentage of fields affected was about average but the severity of infection was lighter than usual (R.C.R.).

BACTERIAL STREAK (Xanthomonas translucens). One field at High Prairie in n. Alta. showed a tr. infection (W.P.C.) and it was 1-tr./8 fields examined in s. Alta. (J.S.H.).

FALSE STRIPE (virus). Four/8 fields in s. Alta. showed tr. infections (J.S.H.).

* See footnote, page 1 (D, W.C.).

YELLOW DWARF (virus) was tr.-sl. in plantings at Ste. Anne de la Pocatière, Que, (R.O. Lachance),

CHLOROTIC LEAF BANDING (high soil-surface temperatures) caused mod. damage to seedlings at Madison, Sask. (B,J.S.),

PHOSPHORUS DEFICIENCY resulted in stunted plants with purplish leaves on high land at Bickleigh, Sask. (T. C. Vanterpool).

RYE

STEM RUST (Puccinia graminis). Trace amounts occurred on Prolific rye in the Rust Nurseries at Charlottetown, P.E.I. (J.E. Campbell).

LEAF RUST (Puccinia recondita) was mod. on Prolific rye at Charlottetown, P.E.I. (J.E.C.).

CEREAL RUSTS IN CANADA IN 1959

B. Peturson, G.J. Green and D.J. Samborski

The following report is a condensed form of Report #15 issued in January, 1960 by the Plant Pathology Section, Canada Department of Agriculture Research Station, Winnipeg, Man

Prevalence of Air-borne Rust Spores in Western Canada

Slides were exposed in stationary spore traps at several localities in Man. and e. Sask. in 1959 to determine the prevalence of air-borne rust spores.

North winds prevailed over the Great Central Plains area during most of May and conditions were unfavorable for the northward movement of rust spores except for about a three day period centering on May 24th when strong south winds were general. During that period (May 22 - 25) several leaf rust spores were caught on slides exposed at Morden and Winnipeg. During the remainder of this month no spores appeared on any of the slides exposed.

During June and July south winds prevailed and there were several periods when wind movements were very favorable for northward spore dispersal. Rust spores, particularly leaf rust spores, were much more prevalent in the air over Man. than during the last few years. The spore-trap data indicate that the early spore showers were centered over Man. and extended westwards as far as Brandon, but not as far west as Indian Head and Regina in Sask.

In 1959, cereal rusts first appeared in the Prairie Provinces in the southern part of the Red River Valley, and gradually spread northward and westward throughout most of Man. and n.-e. Sask. The advance of the rusts westward into the dry areas of s.-w. Man., Sask., and Alta, was greatly retarded by lack of moisture and only trace amounts of rust developed in these areas.

Leaf Rust of Wheat (Puccinia recondita)

As in 1958, leaf rust was the most prevalent cereal rust in Western Canada, It was first observed in Man, on June 15, two weeks earlier than in 1958. It developed rapidly on Thatcher and other susceptible varieties and spread northwestward into n.-e. Sask, where moderately heavy infections developed on Thatcher, In the Red River Valley an 85 per cent infection developed on Thatcher before the end of the season. In a 12-acre experimental field of Thatcher near Winnipeg in which portions of the field were protected by a good rust control fungicide there was a substantial increase in yield in the treated parts of the field over the unprotected parts. In the protected parts of the field, where leaf-rust infection amounted to 10 per cent, the per acre yield was 31.3 bushels, while in the untreated parts of the field, where leaf-rust infection averaged 85 per cent, the yield was 22.1 bushels per acre, indicating a yield loss of 9.2 bushels per acre due to leaf rust, The actual yield loss owing to leaf rust in this field was probably 10 bushels per acre or higher as complete rust control was not achieved with the fungicidal treatment, In several other controlled experiments leaf rust caused as great or greater yield losses to Thatcher. Since about 100,000 acres were sown to Thatcher wheat and other leaf-rust susceptible varieties in Man, in 1959, a yield loss of 1,000,000 bushels is indicated for Man, this year owing to the use of leaf-rust susceptible varieties, In the main wheat crop, consisting largely of the leaf-rust resistant variety Selkirk, infection was light and did not get firmly established until late in the season and appeared to cause only an unimportant yield loss.

In n.-e. Sask. the leaf rust infection on Thatcher, although moderately heavy in some fields, came later and probably caused only minor damage. Only trace amounts of leaf rust occurred in the dry areas of Sask. and in Alta, and caused no appreciable damage there,

Stem Rust of Wheat (Puccinia graminis tritici)

Wheat stem rust was found first in the Red River Valley in 1959, on June 19, about the normal date for its appearance, However, 85 per cent of the wheat acreage in Man, was sown to the highly stem-rust resistant variety Selkirk. All but a fraction of 1 per cent of the remainder was sown to durum wheat and to the varieties Thatcher, Lee, Redman and Regent, which are resistant to the prevalent races of stem rust except race 15B. This race was not very common in Western Canada and very little stem rust developed on these varieties in Man,

Extremely dry conditions in much of the rust area of Sask, and the culture of Thatcher wheat there precluded stem rust damage, As stem rust did not spread westward into Sask, and Alta. where considerable acreages of susceptible wheats are grown, the entire wheat area of Western Canada escaped stem rust damage in 1959. Had susceptible wheat varieties been grown in the rust area of Western Canada it seems certain that heavy rust damage would have occurred in the localities where rainfall was plentiful as high percentages of stem rust developed on wild barley and on susceptible varieties in experimental plots in

c. and e, Man, For example, 75 per cent infection of leaf rust and upwards of a 60 per cent infection of stem rust developed in a 12-acre experimental field of Marquis near Winnipeg. This summer-fallowed field yielded 10.4 bushels per acre of wheat that weighed 53 pounds per bushel, whereas, a field of Selkirk wheat on similar land on an adjoining farm yielded 35 bushels per acre.

Light rust infections occurred on the durum variety Ramsey and on some barley varieties but not in sufficient amounts to cause appreciable damage. Only trace amounts of stem rust developed on these crops in Sask. and Alta.

Stem Rust of Oats (Puccinia graminis avenae)

Oat stem rust was not found until July 23, at Rosenfeld, in the Red River Valley. Subsequent development was slow, and late in the season only small amounts of rust were present on susceptible varieties in experimental plots and on wild oats in Man, Traces of stem rust were present on oats as far west as Indian Head, Sask.

Crown Rust of Oats (Puccinia coronata)

A few widely scattered pustules of crown rust were observed on oats in the Red River Valley on June 30. Apparently air-borne crown rust spores were scare during June and early July for crown rust increased very slowly (much slower than leaf rust of wheat) and only a light sprinkling of this rust was present on oats in the Red River Valley by early Aug. In this area, oat crops that ripened by mid-August were infected only slightly and were not damaged by rust, However, oat fields that did not ripen until early Sept. carried a crown rust infection averaging about 40 per cent and suffered small yield reductions. Most oat fields ripened before crown rust became prevalent and the total damage caused by crown rust in e. Man. was minor, Outside the Red River Valley light infections of crown rust occurred only in w. Man. and e. Sask.

Leaf Rust of Barley (Puccinia hordei)

A light infection of leaf rust was present on barley throughout Man. and westward into Sask, as far as Saskatoon, Although considerable amounts occurred in some fields in e, Man. it arrived late and did not cause much damage,

Leaf Rust of Rye (Puccinia recondita)

A trace of rye leaf rust was found in the Red River Valley in Man. but it was not found in w. Man, or in Sask, and Alta.

Flax Rust (Melampsora lini)

Ninety-five per cent of the flax acreage in Man, was sown to highly rust resistant varieties. An extensive rust survey failed to detect any rust on the resistant varieties. However, a light infection of rust was found on Redwing, a susceptible variety, in one locality in the western part of the Red River Valley. In Sask., a high percentage of the flax acreage was sown to resistant varieties. Virtually no rust was present oh flax in that province in 1959. Rust was not found on flax in s, Alta. in 1959. However, trace amounts of rust on flax were found in the Ft. Vermilion area, One field of Redwing was severely infected.

Cereal Rusts and Other Diseases in the Rust Nurseries in 1959

In 1959 rust nurseries were grown at 32 locations in Canada. At least one nursery was located in each province,

The varieties grown in the rust nurseries are: Wheat: McMurachy, R.L. 1313; Lee, R.L. 2477; Kenya Farmer, R.L. 2768; Marquis, R.L. 84; Mindum, R.L. 1344; Thatcher, R.L. 1945; Selkisk, R.L. 2769; Canthatch, R.L. 2936; Exchange, R.L. 1803; Frontana, R.L. 2336; Ramsey, Ld. 369; Pembina, R.L. 2814, Oats: Bond, R.L. 1130; Trispernia, R.L. 3; Exeter, R.L. 53; Garry, R.L. 1692.27; Clinton, R.L. 66; Landhafer, R.L. 91; Rodney, R.L. 2123; R.L. 2278. Barley: Montcalm, C, A.N. 1135; Vantage, Br, 1356; Parkland, Br. 3833, Rye: Prolific. Flax: Bison, Dakota and Raja.

Wheat Stem Rust (Puccinia graminis tritici)

Wheat stem rust infections were generally light in the rust nurseries in 1959 as has been the case for several years. The amount of rust, as indicated by the infection on the susceptible variety Marquis, was greatest at Creston, B.C. and in the Red River Valley in s. Man. Lighter infections occurred at most locations in Ont. and Que. although some varieties in the nursery at Mindemoya, Ont., were severely infected. There was little or no rust in nurseries in Sask., Alta. and the Atlantic Provinces,

Most of the rust in the Creston nursery was race 11, but In the rest of the country race 56 predominated. The return to predominance of race 56 has greatly affected the amount of rust found on varieties such as Lee and Thatcher. While race 15B predominated these Varieties were susceptible and were often severely attacked but since 1956 they have been lightly infected. The moderate infections on McMurachy in Ont. and Que. were caused by races 29-1 (Can.) and 48A. Selkirk and the new varieties Canthatch and Pembina were nearly free from rust in all nurseries.

Wheat Leaf Rust (Puccinia recondita)

Heavy leaf rust infections occurred in nurseries in all provinces except Alta. The heaviest infections were recorded in Man, and n. -e. Sask. The leaf rust reaction of the varieties in the nurseries was the same as in 1958. Rust reactions on Mindum, Ramsey and Exchange at Creston were of a moderately resistant type. All rust reactions on Selkirk were of a resistant or moderately resistant type, Exchange and Frontana were highly resistant to all locations.

Oat Stem Rust (Puccinia graminis avenae)

Oat stem rust infections were absent or quite light in all nurseries except those at Winnipeg, Man,, Appleton, Ont., and Ste. Anne de la Pocatière, Que, The scarcity of this rust probably resulted from the very late arrival of inoculum from the south. Oat stem rust was not observed in s. Man. until July 23. The severe infection at Winnipeg may have originated from nearby artificially inoculated plots. There is a possibility that barberry was responsible for the severe infections at Appleton and Ste. Anne de la Pocatière.

The infections on the variety Garry at Winnipeg were of a resistant type but a 10 per cent infection on Rodney was of a susceptible type and was caused by race 7A. The infections on these two varieties at Kemptville, Merrickville, Appleton and Ste. Anne de la Pocatière were of a susceptible type and were caused by races such as 8A, 6A and 13A.

Oat Crown Rust (Puccinia coronata avenae)

varieties at Christie in s, Man, and a light to moderate infection occurred on Bond, Exeter, Garry and Rodney at Morden, Man, Crown rust was not found in any of the nurseries west of Melfort, Sask. In Eastern Canada, moderate to heavy infections developed on some of the varieties at Merrickville, and Mindemoya, Ont., at Ste. Anne de la Pocatière, Que., and at Brule, N. S. A light infection was present at Normandin, Que. Elsewhere in Eastern Canada, crown rust was either absent or occurred in trace amounts in the nurseries.

The Rusts on Barley and Rye

The distribution of the leaf and stem rusts attacking barley and rye is much like the distribution of the wheat rusts, Stem rust infection on the susceptible barley variety Montcalm was severe only in the nurseries in s. Man. Moderate or light infections occurred at Creston, B. C. and in several nurseries in Eastern Canada. The stem rust resistant varieties Vantage and Parkland were not severely attacked in any nursery, More than the usual amount of barley leaf rust occurred in nurseries at Brandon and Morden in Man.

Flax Rust

Flax rust was found in only the nurseries at Beaverlodge and Edmonton in Alta., and at Kapuskasing and Merrickville in Ont. Nowhere did the infection exceed 1 per cent on Bison and Dakota and no rust was observed on Raja. Flax rust was scarce or absent in all flax fields examined in Western Canada, except in one field of Redwing near Fort Vermilion, Alta., where infection was severe.

Diseases other than rusts

A summary of the incidence in the nurseries of diseases caused by Erysiphe graminis, Septoria spp. and *Bipolaris and Dreehslera spp, appear in Table 2 along with a summary of the rust nursery data for the rusts, Mildew

* See footnote, page 1 (D, W. C.).

Table 2, Incidence[1] of certain pathogenic fungi on wheat, oats, barley and rye at 32 locations in Canada in 1969

	WHEAT				OATS			BARLEY						RYE	
	P. gr. tritici	P. recondita	Erysiphe graminis	Septoria spp.	P. gr. avenae	P. cor. avenae	S. avenae f. sp. avenae	P. graminis	P. hordei	Erysiphe graminis	S. passerinii	D. teres	B. sorokiniana	P. gr. secalis	P. secalina
Agassiz, B.C.	0	3	0	2	0	0	2	0	0	0	0	0	2	1	3
Creston, B.C.	4	4	0	2	2	0	0	3	0	0	0	0	1	2	0
Beaverloage, Alta.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Edmonton, Alta.	0	2	0	0	0	0	0	0	2	0	1	0	0	0	2
Lethbridge, Alta.	0	1	0	0	3	0	0	0	0	0	0	0	0	0	0
Lacombe, Alta.	0	0	0	0	3	0	0	0	0	0	0	3	0	0	0
Scott, Sask.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yelfort, Sask.	2	4	0	1	0	1	0	0	0	0	0	1	0	0	0
Indian Head, Sask.	1	3	0	0	1	0	0	1	0	0	0	0	0	0	0
Brandon, Man.	3	4	-[2]	-	2	1	-	4	2	-	-	-	-	1	3
Morden, Man.	4	4	0	-	2	3	0	4	3	0	4	-	-	2	3
Christie, Man.	3	4	0	2	1	2	0	-	-	0	0	-	4	0	1
Winnipeg, Man.	4	4	0	-	4	-	-	2	2	-	4	-	-	1	2
Fort William, Ont.	3	4	-	-	2	1	-	1	1	-	-	-	-	1	2
St. Catharines, Ont.	1	2	2	1	0	0	-	1	0	-	-	-	-	4	2
Guelph, Ont.	3	3	0	1	1	2	3	2	0	4	0	0	0	1	2
Kemptville, Ont.	-	-	-	-	3	0	3	2	-	4	-	-	-	2	-
Ottawa, Ont.	1	1	-	-	0	0	-	0	0	-	-	-	3	0	0
Merrickville, Ont.	2	1	3	-	2	4	4	2	0	4	-	-	-	2	2
Mindemoya, Ont.	4	4	0	-	3	4	0	3	1	3	0	0	0	3	3
Appleton, Ont.	3	2	2	2	4	1	3	2	0	3	-	0	3	4	3
Macdonald College, Que.	2	3	1	0	2	0	0	1	1	2	1	0	1	1	3
Lennoxville, Que.	2	3	0	0	2	1	2	0	0	0	1	0	1	2	4
Ste. Anne de la Poc., Que.	3	3	0	3	4	3	4	1	0	0	1	-	2	1	3
Normandin, Que.	3	3	0	3	3	2	4	0	1	-	4	0	2	1	2
L'Assomption, Que.	3	4	0	0	2	0	2	2	1	0	0	0	0	0	3
Fredericton, N.B.	1	3	0	3	0	0	4	1	1	0	1	0	1	2	3
Kentville, N.S.	2	3	-	4	3	1	3	0	0	0	0	0	4	3	2
Brule, N.S.	0	3	-	-	1	4	-	0	0	-	0	0	3	0	0
Nappan, N.S.	0	4	-	1	0	1	4	0	0	0	1	0	2	0	0
Charlottetown, P.E.I.	0	4	0	2	4	1	4	0	0	0	0	0	2	1	3
St. John's Test, Nfld.	0	2	0	1	3	0	3	0	0	0	4	0	0	0	2

1/ 1 = trace, 2 = light, 3 = moderate, 4 = heavy.
For the rusts 1 = tr. - 1%, 2 = 2 - 20%, 3 = 21 - 50%, 4 = over 50%

2/ A dash signifies no observation was made.

(Erysiphe graminis) infections were light except on barley in Eastern Canada. Oats were severely attacked by Septoria avenae f. sp. avenae throughout Ont., Que. and the Atlantic Provinces. Speckled leaf blotch (Septoria passerinii), net blotch

Creston, B.C. Usually this disease is common in Alta. and w. Sask,

Distribution of Physiologic Races

Puccinia graminis f. sp. tritici

Twenty races and subraces of wheat stem rust were identified in Canada in 1959, These races, number of isolates in brackets, are: 10 (1), 11 (5), 11-1 (Can.) (5), 15 (4), 15B-1 (Can.) (7), 15B-1L (Can.) (20), 15B-4 (Can.) (40), 17 (3), 29-1 (Can,) (21), 29-3 (Can.) (1), 29-5 (Can.) (1), 32 (3), 34 (1), 38 (4), 48A (13), 56 (113), 56A (2), 59 (3), 87 (1), 97 (1).

The distribution of races in 1959 was similar to that in 1958, The greatest change was an increase in the prevalence of race 56 from 32.2 per cent of the isolates in 1958 to 45.4 per cent in 1959, Race 56 has been increasing in prevalence since 1955. The subraces of 15B were about as prevalent as in 1958 but the prevalence of the other more common races diminished, probably because of the increased predominance of race 56, Races 29-1 (Can.) and 48A continued to be more common in Eastern Canada than in the Prairie Provinces.

An appreciable number of 1959 collections were from susceptible hosts. The distribution of races from these hosts is probably a more accurate indication of the relative prevalence of some races than from the data which includes isolates from resistant and hence selective varities. Race 56 appears to have constituted about 60 per cent of the rust in Canada in 1959, not 46 per cent as indicated above.

Puccinia recondita

Twelve races of wheat leaf rust were identified in the 1959 physiologic race survey. The races isolated are (number of isolates in brackets): 1 (10), 5 (87), 9 (27), 11 (42), 15 (132), 2'8(11), 30 (5), 35 (12), 52 (2), 58 (32), 126 (15), 140 (2).

In 1957 and 1958, races 1 and 11 were predominant in Sask, These races are characteristic of the western coastal areas and of s. Alta, In 1959, the races prevalent in Sask, were similar to those in Man, This represents a return to the usual pattern of race distribution. The race distribution in other parts of Canada was similar to that observed in recent years,

* See footnote, page 1 (D.W.C.).

The commercial variety Selkirk was resistant to all cultures tested. Different cultures produce (0: to 1-) or (2) reactions on Selkirk but no culture virulent on Selkirk (type 4 reaction) has been isolated in Canada,

Puccinia graminis f. sp. avenae

Eleven races of oat stem rust were found in Canada in 1959. The races, with the number of isolates in brackets, are: 1 (3), 2 (3), 6 (4), 6A (35), 7 (28), 7A (30), 8 (3), 8A (2), 10 (1), 11A (2), 13A (4). The letter "A" indicates races virulent on Rodney.

The distribution of oat stem rust races in 1959 differs in several respects from the 1958 distribution. In 1958 race group 1, 2, 5, race group 3, 7, 12 and race group 4, 6, 13 were about equally prevalent. In 1959 races 1, 2, 6, 8, and 10 occurred rarely but race 7, the predominant race from 1953 to 1957, again was the most common of the older races. Race 7A, which is virulent on the variety Rodney has steadily become more prevalent since its discovery in 1952. Its prevalence increased from about 15 per cent of the isolates in 1958 to 26 per cent in 1959, The 1959 figure probably over-estimates the prevalence of this race because many of the isolates were obtained from selective varieties. Despite the apparent exaggeration of the prevalence of race 7A it is reasonably certain that its prevalence has increased, It was overwhelmingly predominant on completely susceptible varieties at Macdonald College and Indian Head. The most important feature of the 1959 survey was the appearance for the third consecutive year in Eastern Canada of races virulent on Garry. Races 8A and 13A have been isolated in each of the last three years, race 6A in the last two years and race 11A for the first time in 1959. Seven of 10 isolates of race 6A from Que. were collected on different varieties at Ste. Anne de la Pocatiere and the remaining 3 isolates came from Riviere Quelle. Twenty-one of the 25 Ont. isolates were collected on different varieties at Appleton and the remaining 4 isolates were from Merrickville. The isolates of races 8A, 11A and 13A also came from these 4 locations. The distribution of races isolated from susceptible varieties supports the conclusion that race 7 predominated in 1959.

Puccinia coronata f. sp. avenae

Collections of crown rust of oats (leaf rust) were obtained from various scattered localities in Eastern and Western Canada in 1959. Twenty-six races and subraces of crown rust were isolated from these collections. Only seven races and subraces (with the percentage of each given in brackets) were isolated in Western Canada: 201 (1.4), 211A (2.7), 213 (2.7), 216 (35.6), 237A (1.4), 274 (52.0), and 279 (4.2). In this area races pathogenic on the variety Victoria and its derivatives predominated. These races have increased greatly in prevalence in the past several years. None of the races pathogenic to Landhafer and Santa Fe were found in Western Canada,

Twenty-four crown rust races and subraces were isolated from the collections originating in Eastern Canada. These were (With percentage of each race given in brackets) as follows: 201 (1.7), 202C (1.7), 203 (3.4), 209 (3.4), 210 (1.7), 210A (3.4), 211 (3.4), 211A (8.5), 212 (1.7), 212B (3.4), 216 (8.5), 228 (1.7), 231 (3.4), 238 (3.4), 239 (1.7), 264 (1.7), 274 (13.5), 276 (1.7), 279 (1.7), 284A (1.7), 290 (3.4), 293 (6.8), 294 (16.8) and 295 (1.7).

In Western Canada 94.5 per cent of the crown rust races isolated are highly pathogenic to oat varieties with resistance from Victoria, while in Eastern Canada only 23 per cent of the isolates are pathogenic to Victoria. However, in the east, six of the races isolated (264, 276, 290, 293, 294 and 295) comprising 32. 1 per cent of all isolates are pathogenic to Landhafer and Santa Fe which have been extensively used in Canada and the United States in breeding for resistance to crown rust, Apparently, in both Eastern and Western Canada most of the crown rust present is pathogenic to the commonly grown oat varieties.

Puccinia hordei

isolations) and race 44 (5 isolations) were the only races identified. All collections studied were obtained from Man. and Sask.

Cereal Diseases at 24 Locations in Alberta and British Columbia

W.P. Campbell and D.W. Creelman

The following report was compiled from data submitted by W.P. Campbell and represents the results of a disease survey on varieties of barley, oats and wheat at 22 locations in north and central Alberta and 2 locations in B.C. For the purposes of this report the stations will be grouped as follows: Central Alberta 13 stations south, to Calgary, of a line extending through Vermilion, Vegreville, Edmonton and Fallis; North Alberta and B.C., 11 stations north of a line extending from Bonnyville through Beaverlodge and including Baldonnell and North Pine in B. C.

Barley Diseases

Eight barley varieties were grown at most c. Alta. stations but additions to and deletions from the basic list resulted in a range of 5-9 varieties. The standard list of varieties was: Wolfe, Parkland, Olli, Traill, Gateways Husky, Nord and Pirkka. Most n. Alta. and B.C. stations had 7 varieties with Wolfe deleted from most tests. The following barley diseases were recorded.

SCALD (Rhynchosporium secalis), in c. Alta,, Acme, 8 - sl./9; Airdrie, 1-mod. 8-sev./9; Bentley, 8-sev./8; Castor, 0/6; Cheddarville, 8-sev./8; Drumheller, 2-tr. 2-sl./6; Evansburg, 1-mod. 7-sev./8; Fallis, 8-sl./8; Leslieville, 6-sl. 2-mod./8; Metiskow, 0/6; Olds, 7-sl./8; Vegreville, 2-tr. 6-sl. /8; Vermilion, 2-tr./5,

In n. Alta. and B. C., Athabasca, 1-sl. 2-mod. 5-sev./8; Beaverlodge, 2-tr./7; Blueberry Mtn,, 4-tr. 1-sl./7; Bonnyville, 3-tr. 2-sl./8; Fairview, 2-tr./7; Goodfare, 2-tr./7; High Prairie, 1-tr. 1-sl./7; McLennan, 1-tr./7; Wanham, 3-tr. 1-sl./7; Baldonnell, B.C., 5-mod. 2-sev./7; North Pine, B.C., 5-tr./7.

Scald was generally more serious at the central than at the northern stations, Drought conditions and poor growth of barley, at Castor and Metiskow would explain the general absence of diseases at those two locations.

NET BLOTCH (*Drechslera teres), in c. Alta., Acme, 7-sl. 1-mod./9; Airdrie, 3-tr. 4-sl./9; Bentley, 1-tr. 2-sl./8; Castor, 0/6; Cheddarville, 0/8; Drumheller, 2-tr. 2-sl./6; Evansburg, 2-tr, 1-sl./8; Fallis, 0/8; Leslieville 7-tr./8; Metiskow, 0/6; Olds, 4-tr. 2-sl./8; Vegreville, 1-tr, 6-sl./8; Vermilion, 1-tr./5.

In n. Alta. and B, C., Athabasca, 3-tr. 2-mod./8; Beaverlodge, 1-tr./7; Blueberry Mtn., 2-tr,/7; Bonnyville, 2-tr. 6-sl./8; Fairview, 2-tr./7; Goodfare, 0/7; High Prairie, 2-tr. 1-sl. 2-mod./7; McLennan, 0/7; Wanham, 0/7; Baldonnell, B.C., 2-tr. 1-sl./7; North Pine, 0/7.

Net blotch was not serious at any station in n. or c. Alta. and no differences in intensity of the disease were apparent between the 2 areas.

ROOT ROT (*Bipolaris sorokiniana, Fusarium spp.), in c. Alta., Acme, 4-tr. 4-sl./9; Airdrie, 7-tr. 2-sl./9; Bentley, 2-tr./8; Castor, 3-tr. 1-sl. /6; Cheddarville, 3-tr:/8; Drumheller, 2-tr./6; Evansburg, 3-tr./8; Fallis, 4-tr./8; Leslieville, 3-tr./8; Metiskow, 1-tr./6; Olds, 1-tr,/8; Vegreville, 1-tr./8; Vermilion, 1-tr./5.

In n. Alta, and B.C., Athabasca, 2-tr. 1-sl. 3-mod. 1-sev./8; Beaverlodge, 2-tr. 2-sl./7; Blueberry Mtn,, 0/7; Bonnyville, 1-tr./8; Fairview, 0/7; Goodfare, 4-tr./7; High Prairie 2-tr, 1-sl. 2-mod./7; McLennan, 0/7; Wanham, 1-tr. 5-sl. 1-mod./7; Baldonnell, B. C., 2-tr. 5-sl./7; North Pine, B. C,, 3-tr. 3-sl./7.

Root rots were slightly more severe in intensity at the northern stations than at the stations in c. Alta.

LOOSE SMUT (Ustilago nuda) in c. Alta., Acme, 2-tr. 3-1%/9; Airdrie, 1-1%/9; Bentley, 3-1%/8; Castor, 1-tr./6 Cheddarville, 1-1%/8; Drumheller, 0/6; Evansburg, 1-tr. 1-1%/8; Fallis, 1-tr./8; Leslieville, 2-tr./8; Metiskow, 3-tr./6; Olds, 4-1%, 1-2%/8; Vegreville, 3-tr./8; Vermilion, 3-tr. 1-1%/5.

* See footnote, page 1 (D. W.C.).

In n. Alta. and B.C., Athabasca, 1-3%/8; Beaverlodge, 1-tr. 1-3%/7; Blueberry Mtn., 1-tr. 2-1%/7; Bonnyville, 1-tr./8; Fairview, 1-2%/7; Goodfare, 1-2%/7; High Prairie, 0/7; McLennan, 0/7; Wanham, 0/7; Baldonnell, B.C., 2-tr. 2-3%/7; North Pine 1-tr. 1-3%/7.

Loose smut was generally somewhat more severe at the northern stations although it was not recorded at 3 of them,

SPECKLED LEAF .BLOTCH (Septoria passerinii) was not recorded from the c, Alta. stations. It was recorded from 10/11 northern stations as follows: Athabasca, 1-tr. 1-sl. 2-mod. 1-sev./8; Beaverlodge, 1-tr./7; Blueberry Mtn., 4-tr./7; Bonnyville, 0/8; Fairview, 6-tr. 1-sl./7; Goodfare, 4-tr./7; High Prairie, 1-tr. 2-sl. 2-mod. 2-sev./7; McLennan, 1-tr./7; Wanham, 1-tr./7; Baldonnell, B.C., 2-tr. 2-sl./7; North Pine, B.C., 4-tr. 1-sl./7.

BACTERIAL STREAK (Xanthomonas translucens) was found at only 1 c. Alta. station, Olds, 4-tr./8. On the northern stations it occurred at Athabasca, 1-sl. 2-mod./8; High Prairie, 1-tr. 1-sev./7; and Baldonnell, B.C., 2-tr. 3-sl./7.

BARLEY FALSE STRIPE (virus) occurred at 3 c. Alta. stations, Acme, 1-5%/9; Airdrie, 1-5%/9; and Drumheller, 1-5%/6. These three stations were the most southery surveyed and in each case the affected variety was Compana.

POWDERY MILDEW (Erysiphe graminis) was recorded only from the n. Alta, station, High Prairie, 2-sl./7.

Oat Diseases

Five oat varieties comprised the plantings at most c. Alta. stations but some contained 8 and one, only 4. The standard oat varieties were Rodney, Glen, Eagle, New Garry and Fundy, Most n. Alta. and B.C. locations had 6 varieties, Garry, Abegweit, 60-day, Glen, Fundy and Victory.

GRAY SPECK (Manganese deficiency) occurred in c. Alta, at 12/13 stations, Acme, 1-sl. 2-mod./5; Airdrie, 0/5; Bentley, 3-sl./5; Castor, 1-sl. 2-mod./5; Cheddarville, 5-sl. 1-mod./8; Drumheller, 1-mod. 3-sev./4; Evansburg, 2-sl./8; Fallis, 2-sl. 1-mod./8; Leslieville, 1-sl. 1-mod. 6-sev./8; Metiskow, 2-mod./5; Olds, 2-sl. 1-mod./5; Vegreville, 2-sl. 1-mod. 2-sev./5; Vermilion, 2-sl. 1-mod. 2-sev./5.

In n. Alta. and B.C., it occurred in only 5/11 locations, Blueberry Mtn., 4-tr. 1-sl. 1-mod./6; Bonnyville, 3-mod. 2-sev./5; Fairview, 3-tr./6; High Prairie 1-mod. 5-sev./6; North Pine, B.C., 1-sl./6.

BLAST (non-parasitic) was recorded only from the northern stations, Beaverlodge, 1-tr. 3-sl. 2-mod./6; Blueberry Mtn., 2-sl. 4-mod./6; Fairview, 3-tr./6; Goodfare 4-tr. 1-sl./6; High Prairie, 2-sl. 3-mod./6; McLennan, 3-tr. /6; Wanham, 2-tr, 2-sl./6; Baldonnell, B.C., 2-tr. 2-sl. 2-mod./6; North Pine, B.C., 2-tr./6.

HALO BLIGHT (Pseudomonas coronafaciens) was recorded only from the northern location Athabasca, 4-tr. 1-sl./8.

Wheat Diseases

Wheat was surveyed only at the 11 northern stations where the following varieties were involved: Thatcher, Selkirk, Saunders, C.T. 229 and C.T. 233. The diseases recorded were:

ROOT ROT (*Bipolaris sorokiniana, Fusarium spp.), Athabasca, 2-tr. 2-sl./5; Beaverlodge, 3-tr./6; Blueberry Mtn., 5-sl./5; Fairview, 1-tr./5; Goodfare, 3-sl. 2-mod./5; High Prairie, 2-tr. 2-sl./5; Wanham, 4-tr. 1-sl./5; Baldonnell, B.C., 2-tr. 2-sl./5; North Pine, B.C., 3-tr. 2-sl./5.

SPECKLED LEAF BLOTCH (Septoria spp.), Beaverlodge, 1-sl./6; High Prairie, 5-tr./5; North Pine, B.C., 1-tr./5.

Cereal Diseases in Cooperative Variety Tests in Alberta in 1959

W.P. Campbell

Twenty-nine plots of 6-rowed varieties of barley and 16 plots of 2-rowed varieties grown at Lacombe were surveyed for disease, In addition, 16 plots at Fallis and 16 at Airdrie were surveyed, The barley diseases were rated as follows:

On 6-rowed barley at Lacombe, scald (Rhynchosporium secalis), 14-tr. 10-sl. 2-mod./29; speckled leaf blotch (Septoria passerinii), 2-tr. 16-sl. 8-mod. 3-sev./29; net blotch (*Drechslera teres), 14-tr. 7-sl./29; root rot (*Bipolaris sorokiniana, Fusarium spp.), 9-tr. 2-sl./29; loose smut (Ustilago nuda), 4-tr. 3-1%. 1-3%/29; covered smut (U. hordei), 1-4%/29.

On 2-rowed barley at Lacombe, scald, 5-tr. 9-sl. 1-mod, 1-sev./16; net blotch, 4-tr. 3-sl./16; root rot, 3-tr. 8-sl./16; speckled leaf blotch, 3-tr. 6-sl. 1-mod./16; loose smut, 1-tr. 1-1%/16; barley false stripe, 1-tr./16.

At Fallis, scald, 4-sl. 12-sev./16; net blotch, 2-tr. 2-sl./16; root rot, 6-tr. 1-sl./16; loose smut, 3-tr. 1-1%/16; and at Airdrie, scald, 3-mod. 13-sev./16; net blotch, 6-tr./16; root rot, 7-tr. 1-sl./16.

Twenty-five plots of wheat and 24 of oats were also surveyed at Lacombe. The disease ratings for wheat were: root rot, 10-tr. 2-sl./25; speckled leaf blotch (Septoria spp.), 10-tr, 1-sl./25; loose smut (Ustilago tritici), 4-1%, 1-3% /25.

Oat disease ratings at Lacombe were: gray speck, 5-tr. 8-sl. 3-mod./24; and blast, 12-tr. 10-sl./24.

* See footnote, page 1 (D.W.C.).

Notes on Cereal and Grass Viruses in 1959

J.T. Slykhuis

Barley yellow dwarf virus (BYDV) was transmitted by aphids from overwintered winter wheat, winter rye, timothy, brome grass, perennial ryegrass, red fescue, Kentucky bluegrass and intermediate wheatgrass at Ottawa, thereby demonstrating that winter reservoirs of the virus are common in the area.

The bird cherry oat aphid (Rhopalosiphum padi L.), an efficient vector of common strains of the virus, passed the winter in the egg stage on cherry trees. By late April it appeared that this aphid species could become abundant and important in spreading BYDV from perennial grasses to young spring grains, but coccinelid beetles become abundant on the cherry trees and the aphids disappeared in early May before spring grains emerged. They were not found again until mid-June and were scarce until August and thus did not appear important in the spread of BYDV, The English grain aphid, (Macrosiphum avenae (Fab.)) was observed in spring oats as early as May 14, before it was found in perennial grasses. The first BYDV infections in spring grains were associated with this aphid and were scattered in patches over the entire field rather than occurring at the edges. It appears that the vector had settled on the fields after prolonged flight and did not come from local sources,

BYDV spread to a limited extent in the Ottawa area during June and July. By mid-July 1 to 5 per cent of the plants in most fields showed yellow dwarf symptoms, but the diseased plants occurred principally in small patches. In these patches the yields were reduced as much as 42 per cent below the yields of the surrounding healthy areas.

BYDV was also isolated from barley leaves sent to Ottawa by Dr, H. A.H. Wallace from Winnipeg. It is also believed to be the cause of a high incidence of chlorotic leaf symptoms on barley and oats, samples of which were sent to Ottawa from Fort William. There was a high incidence of the disease on some oat crops near Montreal, and it was identified on oats at Fredericton, New Brunswick.

Agropyron mosaic virus (AMV), which occurs on Agropyron repens in most areas in southeastern Ontario, spread slowly to immature wheat in experimental plots during the summer of 1959, By early September all plants in a 1/4-acre plot of Cornell winter wheat, sown in late May, were infected with the virus. Although the spread of the virus appears to be associated with eriophyid mites, none of the 3 species of mites usually present with the virus has been proved to be a vector.

Symptoms like wheat striate mosaic were found on a timothy plant collected in October, 1958, The painted leafhopper (Endria inimica Say), which is a vector of the wheat striate mosaic virus, is common in the Ottawa area each summer, and transmission tests were made with this insect. In one such test, Kent wheat plants on which E. inimica fed after feeding for one week on the diseased timothy, developed symptoms resembling mild striate mosaic. Similar

symptoms were also observed in August, 1959 on spring-sown Cornell winter wheat that remained vegetative all summer and fall. Further experiments are needed to verify the presence of wheat striate mosaic in southeastern Ontario,

Virus-like symptoms, including severe rolling and stiffening of leaves, chlorotic streaks and blotches, and stunting developed on young Kent wheat plants that were infested with Brachycolus frequens, an aphid that often occurs on Agropyron in southeastern Ontario. After affected plants were sprayed repeatedly with Malathion to kill the aphids, they appeared to recover completely and grow normally, but the non-sprayed plants eventually died. It appears that the symptoms associated with these aphids are not caused by a virus but by toxic effects of aphid feeding.

Cereal Smuts in Western Canada - 1959

W. Popp

Loose smut of wheat was relatively scarce in Manitoba in 1959 (Table 3). Infection consisted of a maximum of 2 per cent in Lee wheat, less than 1 per cent in durum varieties, and none in Selkirk. Selkirk occupied over 83 per cent of the crop acreage.

Eighty-three per cent of the barley fields examined in Manitoba were found to be smut infected, There was an average of 1.5 per cent in the crop as a whole. As compared to 1958, there was a decline of loose smut and an increase of covered smut, This coincides with a change in the relative prevalence of Montcalm and Parkland barley. Montcalm is affected mainly by loose smut whereas Parkland is prone to infection by covered smut.

Practically no smut, either loose or covered, was found in oats.

All major classes of wheat inspected in 1959 by the Western Inspections Branch of the Board of Grain Commissioners were relatively free from bunt (Table 4). This is rather unusual for Alberta Red Winter wheat. The amount of bunt found in the 1958 crop is shown in Table 5.

Table 3. Cereal Smuts in Manitoba - 1959

Cereal	Kind of Smut	Per Cent smut in Fields	
		Range	Mean
Wheat	Loose	0 - 1	trace
	Bunt	---	0
Barley	Loose	0 - 6	0.4
	Covered	0 - 10	1.0
	False loose	0 - 3	0.1
Oats	Loose and covered	0 - trace	trace

Table 4. Bunt of Wheat in Western Canada
August 1, 1959 to October 31, 1959.

Class of Wheat	Cars Inspected	Cars graded "Smutty"	Percentage graded "Smutty"
Hard Red Spring	47269	21	0.04
Amber Durum	4379	0	0.00
White Spring	35	0	0.00
Alta, Red Winter	545	0	0.00
Garnet	70	2	2.86
Mixed Wheat	22	0	0.00
All classes	52320	23	0.04

Table 5. Bunt of Wheat in Western Canada
August 1, 1958 to July 31, 1959

Class of Wheat	Cars Inspected	Cars graded "Smutty"	Percentage graded "Smutty"
Hard Red Spring	175781	99	0.06
Amber Durum	8351	1	0.01
White Spring	272	0	0.00
Alta, Red Winter	248	2.	0.81
Garnet	4	0	0.00
Mixed Wheat	89	0	0.00
All **classes**	184745	102	0.06

The Occurrence of Surface-borne Smut Spores in Samples of Cereal Seed Produced in the Prairie Provinces in the Crop Years 1945 - 1958

Dr. F.J. Greaney has provided the data given in Table 6 from the results of tests of farmers' seed samples made by the Line Elevators Farm Service, Winnipeg, Man.

Table 6. Smut Spores on Farmers Seed Samples 1945 - 1958

Year seed produced	WHEAT		OATS		BARLEY	
	Samples examined	% bearing smut spores	Samples examined	% bearing smut spores	Samples examined	% bearing smut spores
1945	6,069	51.2	1,600	90.3	1,602	95.1
1946	8,267	71.3	2,978	89.3	1,043	96.4
1947	9,178	66.8	2,800	88.3	687	94.2
1948	7,442	60.6	2,405	85.9	1,369	92.4
1949	9,570	44.6	2,936	81.1	1,679	88.9
1950	11,993	45.6	5,331	73.5	3,149	89.2
1951	2,730	47.9	1,106	84.4	1,124	66.8
1952	5,121	46.7	1,655	87.4	1,584	63.6
1953	5,255	38.8	1,528	85.9	1,705	93.1
1954	3,464	27.7	1,140	81.3	1,230	90.1
1955	3,428	25.6	1,931	73.1	1,656	91.8
1956	6,148	20.1	1,122	82.4	1,144	95.0
1957	4,523	22.4	1,931	75.2	3,074	91.0
1958	4,031	12.4	1,444	69.7	1,894	90.1

Seed Treatment Survey in the Prairie Provinces - 1959

The information in the Table 7 was supplied by Dr. F.J. Greaney of the Line Elevators Farm Service, Winnipeg.

In June,, 1959, Elevator Agents of Member Companies were asked to estimate and report the percentage of the total acreage of each of the crops of wheat, oats, barley and flax, in their respective districts, that was planted

treated seed in 1959. The results, by provinces and crop districts, are tabulated below. (Number of individual reports used to determine the average acreage estimates in brackets.)

Table 7. Results of 1959 Seed Treatment Survey

Province and Crop District	Percentage of Total Acreage Planted with Treated Seed:			
	Wheat	Oats	Barley	Flax
MANITOBA				
Average 1/	47.2 (102)	25.6 (91)	42.1 (98)	40.3 (78)
SASKATCHEWAN				
1A	50.7	25.5	54.3	46.6
1B	43.9	46.1	73.3	65.0
2A	65.7	55.0	72.9	46.7
2B	56.7	51.5	67.6	51.5
3AN	64.8	60.2	81.1	55.7
3AS	68.9	65.5	75.4	72.4
3BN	70.4	67.9	78.7	59.6
3BS	65.9	73.2	81.8	72.7
4A	73.3	67.5	77.9	74.0
4B	81.8	76.1	81.0	73.6
5A	27.3	39.8	49.4	55.0
5B	36.8	42.9	64.2	62.4
6A	52. 1	64.7	77.3	57.4
6B	63.7	53.9	75.4	51.7
7A	83.8	78.5	94.0	80.0
7B	74.6	75.0	90.3	85.8
8A	43.2	45.6	56.5	37.9
8B	38.8	70.0	78.9	61.5
9A	57.6	61.3	76.5	85.7*
9B	48.7	67.5	75.4	72.5*
Average 1/	60.3 (651)	60.7 (619)	74.7 (656)	63.2 (456)
ALBERTA				
1	87.0	76.7	85.2	66.7
2	41.6	83.8	92.9	81.2
3	89.0	81.4	91.2	87.1
4	80.8	81.3	88.8	78.5
5	78.6	74.2	79"7	92.9*
6	84.6	78.8	83.0	75.0*
7	89.0	84.8	85.1	84.3
Average 1/	86.3 (386)	81.1 (384)	91.2 (384)	81.3 (234)
PRAIRIE PROVINCES				
Average 1/	67.9 (1139)	65.0 (1094)	77.5 (1138)	66.4 (768)

* Based on less than 10 individual reports.
1/ Weighted.