remainder of the period of examination but with no period of peak discharge being noted. Very little speckled leaf blotch infection was observed in 1958 as compared to 1957.

Cereal Rusts in Canada in 1958

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Influence of Weather on Cereal Rust Development

Weather conditions were unfavorable for the development of cereal rusts throughout the Prairie Provinces during most of the summer of 1958. In May, temperatures were slightly above normal but precipitation was from 50 to 100% below normal. Precipitation at Winnipeg for the whole of May was only .42 inches and in many prairie localities even less precipitation was received. During June temperature and precipitation in Sask. and Man. were sub-normal. The deficiencies in temperature ranged from 2 to 6F.° and deficiencies in precipitation ranged from 30 to 70%. In some prairie localities in Sask. and Man. the spring drought came to an end on 28 June, but in many localities the first substantial spring precipitation occurred during the first week in July. June temperatures were generally near normal in Alta. while precipitation was about 30% above normal in the foothills area and about 40" below normal in the eastern parts of the province. The average July temperature in Man. ranged from normal to three degrees below normal; in Sask. the temperatures ranged from 1° above normal to 3° below normal; and in Alta. temperatures were slightly below normal. Above normal pre cipitation across the prairies in July favored the rusts but temperatures were too low for rapid rust development. During the remainder of the crop season temperatures were near normal in Sask. and Man. but much above normal in Alta. Precipitation was from 30 to 50% below normal excepting in a few areas such as Regina, Edmonton and Lethbridge.

Prevalence of Air-borne Rust Inoculum in Western Canada

Northerly winds prevailed over the Great Plains area of the United States and Canada during May, June and early July. As a result of the unfavorable conditions for the northward movement of spores and a smaller than usual amount of cereal rusts in southern areas, the number of air-borne rust spores over Man. and e. Sask. was relatively small. Spore-trap data (Table 7) show that there was much less rust inoculum in the air over the rust area in 1958 than during the two heavy rust years of 1954 and 1955.

Table 7

	May			June			July		
	Winnipeg	Morden	Regina	Winnipeg	Morden	Regina	Winnipeg	Morden	Regina
Stem Rust									
1954	0*	0	0	173	30	436	4,180	44,820	14,590
1955	1	4	1	2	10	4	847	2,929	94
1956	1	1	1	4	4	19	10	37	11
1957	0	0	0	0	0	2	21	53	25
1958	0	0	0	9	3	2	6	104	2
Leaf Rust									
1954	0	2	0	91	19	436	4,865	59,904	114,600
1955	4	12	5	43	70	25	943	4,192	413
1956	0	0	0	1	11	30	57	133	95
1957	0	0	0	5	7	32	99	576	102
1958	0	0	0	0	5	3	12	561	3

* Figures represent the number of rust spores caught on one square inch of vaselined slide exposed in stationary spore traps.

The cereal rusts followed their usual pattern of movement in the Prairie Provinces in 1958, entering first at the s.-e. corner of the region and progressing towards the n.-w. The major spore showers seem to have occurred in a rather small area centering on the Red River Valley in Man. The large acreage of resistant Selkirk wheat and Rodney and Garry oats in that area helped to prevent a significant increase of the rusts and probably provided some protection for the more susceptible varieties grown farther west.

Evidently a secondary rust movement from s.-w. Alta. northwards and eastwards occurred later in the season. Wheat leaf rust race identifications show that the races prevalent in s.-w. Alta. were different than those occurring on the eastern prairies. Similarly the distribution of wheat stem rust races is different in Alta. than in Man. and Sask. The predominance of race 11 in Alta. coincides with the predominance of this race in the Washington-Oregon-Idaho area where a severe stem rust epiphytotic occurred in 1958.

Leaf Rust of Wheat

Wheat leaf rust was the most common cereal rust in Western Canada in 1958 but it caused only small or insignificant over-all losses. Leaf rust was first observed in Man. on 2 July, the same date as last year, and somewhat later than usual. Its development was restricted by the large acreage sown to the moderately resistant Selkirk wheat. Heaviest infections were found in fields east of a north-easterly line running through Killarney and Gladstone in Man. Late in the season susceptible varieties east of this line were severely infected and some late fields of Selkirk showed infections ranging up to 70%, the most severe infections ever observed on that variety. The severity of infection diminished to the north and west. In Sask. little rust development occurred. However, leaf rust was present throughout most of that province in trace to slight amounts. In s. Alta. leaf rust was first observed on 26 June on irrigated soft wheat and by 8 Aug. infection was general. Soft wheats were heavily infected. In c. and n. Alta. only traces of leaf rust occurred.

Stem Rust of Wheat

The distribution of wheat stem rust was similar to that of wheat leaf rust, but infections were much less severe and damage was negligible. Stem rust was first found in Man. on 17 July, five days later than last year, and considerably later than usual. By the end of the season the small amount of susceptible wheat in the area most severely affected by rust had infection ranging up to 60%. However, nearly all the common wheat in Man. was Selkirk and this variety was virtually free from stem rust throughout the season. Most of the durum wheat was Ramsey which had infections ranging up to 10% by the end of the season. Preliminary reports indicate that stem rust was scarce in Sask. It was not found in s. Alta. until Aug. 6 and did not develop in time to cause losses.

Stem Rust of Oats

The distribution of stem rust of oats was the same as that of stem rust of wheat in Man. It extended into the extreme eastern part of Sask., but was not found in other parts of that province or in Alta. Oat stem rust was first observed on 31 July, six days later than last year and much later than usual. Although it was common on susceptible wild oats in s.-e. Man. in early Aug., infections were scarce on cultivated oats. By the end of the season, however, some late fields of cultivated oats had moderate infections.

Crown Rust of Oats

Crown rust of oats was first found in Man. on 24 July, nine days later than last year. It spread very slowly. In the southern and eastern part of the Red River Valley it reached a maximum intensity by the end of August of from 1 to 5% on wild oats, and only trace amounts of Rodney and Garry oats,

which comprised about 90% of the Man. oat acreage. In w. and n. Man. crown rust occurred in trace amounts only and it probably extended as occasional infections into s.-e. Sask. Crown rust was not reported in Sask. and Alta.

Other Cereal Rusts

A trace of leaf rust of barley occurred in the Red River Valley. A light infection of leaf rust of rye, averaging about 10%, was present on rye in late sown rust nurseries at Morden and Brandon in Man. In commercial rye fields only trace amounts were present. Occasional pustules of stem rust were observed on rye in s. Man. These rusts were not found in the other two Prairie Provinces.

Losses from the Cereal Rusts in 1958

Rust losses were unimportant in 1958, although some late fields of Selkirk may have suffered some damage from leaf rust and the few fields of susceptible varieties probably were damaged by stem rust. In Sask. rust losses were negligible. Some losses from leaf rust may have occurred in s. Alta. but rusts caused no damage in central and n. Alta.

Flax Rust

Flax rust was quite scarce in Man. in 1958 and caused little damage. In 1958, about 93% of Manitoba's flax acreage was sown to rust resistant varieties. An intensive survey failed to reveal the presence of rust in fields of resistant varieties. However, in one area in the west central part of the Red River Valley a light infection of rust was found in several fields of Redwing flax. Except for traces of rust in the rust nurseries at Morden, Brandon and Winnipeg this rust was not found elsewhere in the province in 1958. In Sask. much of the flax acreage is sown to rust resistant varieties and flax rust was of little or no importance. A greater percentage of susceptible flax was grown in Alta. than in the other two Prairie Provinces. A slight rust infection occurred in some fields in n. Alta. where Redwing is commonly grown.

Cereal Rusts and Other Diseases in the Rust Nurseries in 1958

The uniform rust nurseries were grown at 33 locations throughout Canada in 1958. The varieties in the nurseries are: Wheat: McMurachy, R.L. 1313; Lee, R.L. 2477; Kenya Farmer, R.L. 2768; Little Club, R.L. 223; Marquis, R.L. 84; Mindum, R.L. 1344; Thatcher, R.L. 1945; Selkirk, R.L. 2769; Redman, R.L. 1834.7; Exchange, R.L. 1803; Frontana, R.L. 2336; Ramsey, Ld. 369; Ld. 368. 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; Parkland, Br. 3833; Vantage, Br. 1356; Feebar, C.I. 7260. Rye: Prolific. Flax: Bison, Dakota and Raja.

Wheat Stem Rust

In the Prairie Provinces appreciable stem rust developed only in the rust nurseries at Morden and Winnipeg in the Red River Valley of Man. In the eight nurseries grown in the region extending from the western boundary of the Red River Valley to Edmonton in Alta. there was no rust except trace infections at Brandon in s.-w. Man. and at Edmonton. Race identifications show that races 56, 11 and 15 were prevalent at Morden and the severe infections on Little Club, Marquis and Mindum at that location, can be attributed to them. The light infections on Lee, Thatcher, and Redman show that race 15B, although present in the area, was not very prevalent. The varieties Little Club and Marquis were severely attacked at Creston, B.C., mostly by races 11, 10, and 2. The severity of the attack and the presence of race 11 suggest that the source of much of the inoculum at Creston was the destructive stem rust epidemic in n.-e. Oregon, e. Washington, and contiguous sections of Idaho. Stem rust occurred in nearly all the nurseries in Ont. and Que. but the infections were light. The highest reading, 40%, was recorded at Kapuskasing and Kemptville, Ont. The varieties Lee, Thatcher, and Redman were lightly infected indicating that race 15B was uncommon in the east as well as in the west. The 15B resistant variety McMurachy was infected in nearly every nursery in Ont. and Que. These infections were caused mostly by races 48A and 29-1 (Can.). The nurseries in the Maritime Provinces were not infected except for a trace of rust at Kentville, N.S. The common wheat varieties Kenya Farmer and Selkirk and the durum wheat variety Ld 368 were nearly free from rust in all nurseries.

Wheat Leaf Rust

Development of leaf rust in the rust nurseries was similar to that in 1957. The scarcity of leaf rust in the Sask. and Alta. nurseries was due to the dry conditions and a lack of air-borne inoculum. Dry conditions at Brandon resulted in little leaf rust in this nursery.

The varieties Lee and Selkirk illustrate some interesting effects of host selection on the rust population. The increased percentage of rust on Lee in recent years is due to an increased percentage of Lee virulent (Type 4) biotypes in the rust population. Selkirk when first released was highly resistant (0) to most isolates tested and moderately resistant (1+ to 2) to the remainder. At present Selkirk is moderately resistant (1+ to 2) to most isolates and highly resistant to only a small percentage of the isolates tested. That proportion of the rust population capable of even limited sporulation on Selkirk obviously has a selective advantage over that which cannot sporulate

on this variety. A consequence has been an increased percentage of rust on Selkirk without the appearance of highly virulent biotypes. In addition, Selkirk becomes less resistant to leaf rust when the plants are nearly mature and observations on such plants may exaggerate the degree of susceptibility. Exchange and Frontana, which possess mature plant resistance, were highly resistant at all locations.

Oat Stem Rust

Traces of oat stem rust occurred in the nurseries at Morden and Winnipeg in Man. but the other prairie nurseries were free from infection. Infections in eastern Canada were general but light except at Appleton, Ont. The severe infection at Appleton is of great importance because the varieties Garry and Rodney were infected nearly as severely as the very susceptible variety Bond. The severe attack on Garry was caused by the new races 6A and 13A, and on Rodney by races 6A, 7A and 13A. Rust was found on Garry and Rodney at Merrickville, St. Anne de la Pocatiere and L'Assomption. Races 6A and 13A were most frequently isolated from these varieties but race 8A also occurred. The pustules on Garry at Charlottetown were resistant type and resulted from a fairly severe attack which caused 30% infection on other varieties.

Oat Crown Rust

Crown rust infections were quite light or absent at most of the localities in Canada where rust nurseries were located in 1958. No crown rust was found on the oat varieties in the rust nurseries located in B.C., Alta. and Sask. and only trace amounts occurred in the nurseries located in Man. In Ont. heavy crown rust infections averaging from 30 to 50% on susceptible varieties occurred at Ottawa and Merrickville. No crown rust was found on oats at Kapuskasing but trace to slight infections developed at all the other nurseries. In Que., a number of the oat varieties had infections averaging upwards of 60% at L'Assomption and Ste. Anne de la Pocatiere. Crown rust was either very light or did not occur in the other nurseries in Que. No crown rust was found on the rust nursery varieties at three stations, Fredericton, Kentville and Nappan, in the Maritime Provinces. Trace to slight amounts of crown rust occurred in the other nurseries in those provinces. A trace of crown rust occurred on Exeter at Doyles, Newfoundland.

Trispernia, Landhafer and R.L. No. 2278 were the most crown rust resistant oat varieties in nurseries. At the four nurseries where substantial amounts of rust occurred these varieties carried only trace amounts of crown rust.

The Rusts on Barley and Rye

The distribution of stem rust and leaf rust on barley and rye was similar to that of stem rust and leaf rust of wheat. Severe infections of stem rust occurred on all barley varieties including the resistant varieties Parkland, Vantage and Feebar at Creston, B.C., Kemptville, Ont., Merrickville, Ont., and Appleton, Ont. Isolations from barley from these locations demonstrated the presence of rye stem rust. Since rye stem rust is known to be virulent on barley varieties resistant to wheat stem rust much of the infection at these locations can be attributed to it.

Flax Rust

A trace of flax rust occurred on both Bison and Dakota in the nurseries at Brandon, Morden and Winnipeg, in Man. In the Alta. nurseries a trace of rust was found on Bison at Lethbridge; 1% and 5% infections developed on it at Beaverlodge and Lacombe, respectively; but none was found in the nursery at Edmonton. No rust was found on Dakota and Raja in the Alta. nurseries. No rust occurred on any of the varieties at the nurseries in B.C. and in Eastern Canada.

Diseases Other Than Rusts

A summary of the incidence of Erysiphe graminis on wheat and barley, Septoria spp. on wheat, S. passerinii on barley, and the various rusts appears in Table 7. The distribution of mildew on wheat and barley in 1958 was similar to 1957. Wheat was attacked by mildew at Lethbridge, Alta., St. Catharines, Kemptville, and Ottawa in Ont. and Kentville, N.S. Barley was attacked in B.C., Ont. and P.E.I. Septoria spp. were observed on wheat in all provinces except B.C., Sask. and Nfld., but in general infections were light. S. avenae f. sp. avenae occurred on oats in all provinces except the Prairie Provinces. This disease had been reported in the rust nurseries in Man. for the two previous years. The 1958 growing season in Man. was dry and unfavorable to the Septoria diseases and it is not surprising that S. avenae was not present in Man. nurseries. Trace infections by this fungus were observed in farmers fields.

All nurseries were examined also for the incidence of spot blotch (Helminthosporium sorokinianum, net blotch (H. teres) and scald (Rhynchosporium secalis) on barley. Spot blotch was the most common of these diseases in the nurseries; trace infections were observed at Melfort, Sask., Mindemoya and Williamstown, Ont., and Kentville, N.S.; light infections occurred at Merrickville, Ont. and Lennoxville, Que.; an infection of moderate intensity occurred at Kemptville, Ont. Light infection of net blotch occurred at Winnipeg, Man., and Lennoxville, Que. There was a trace of scald at Edmonton and a light infection at Lethbridge.

Table 1. Incidence[1/] of certain pathogenic fungi on wheat, oats, barley and rye at 33 locations in Canada in 1958

Locality	WHEAT				OATS			BARLEY				RYE	
	P. gr. tritici	P. recondita	E. [illegible]	Septoria spp.	P. gr. avenae	P. cor. avenae	S. avenae	P. graminis	P. hordei	E. graminis	S. passerinii	P. gr. secalis	P. secalina
Saanichton, B.C.	0	2	0	0	2	0	1	0	0	3	0	0	0
Agassiz, B.C.	0	3	0	0	1	0	1	0	3	4	0	1	3
Creston, B.C.	4	4	0	0	0	0	0	4	2	0	0	2	3
Beaverlodge, Alta.	0	0	0	0	0	0	0	0	0	0	0	0	0
Edmonton, Alta.	1	2	0	1	0	0	0	1	0	0	0	0	1
Lethbridge, Alta.	0	1	3	2	0	0	0	0	0	0	0	0	0
Lacombe, Alta.	0	2	0	0	0	0	0	0	0	0	3	0	1
Scott, Sask.	0	0	0	0	0	0	0	0	0	0	0	0	0
Melfort, Sask.	0	t	0	0	0	0	0	0	0	0	1	0	0
Indian Head, Sask.	0	t	0	0	0	0	0	0	0	0	0	0	0
Brandon, Man.	1	2	-	-*	0	1	0	0	0	-	-	1	1
Morden, Man.	4	4	0	2	1	1	0	2	1	0	4	2	4
Winnipeg, Man.	4	4	0	2	1	1	0	1	0	0	4	1	3
Kapuskasing, Ont.	3	3	0	3	2	0	2	0	0	0	4	0	1
St. Catharines, Ont.	1	3	4	0	0	1	1	0	0	4	0	0	3
Kemptville, Ont.	3	4	4	1	2	1	4	2	1	3	0	2	3
Ottawa, Ont.	2	4	2	4	2	3	4	0	2	4	-	1	4
Merrickville, Ont.	2	4	0	0	1	4	2	3	2	1	3	4	4
Mindemoya, Ont.	2	4	0	0	3	3	4	1	2	0	0	1	3
Appleton, Ont.	2	4	0	0	4	2	0	3	2	0	0	2	3
Williamstown, Ont.	1	4	0	3	1	1	4	0	0	1	2	1	3
Macdonald College, Que.	2	4	-	1	1	2	4	1	2	-	-	1	3
Lennoxville, Que.	3	4	0	2	0	0	0	1	0	0	0	3	3
Ste. Anne de la Poc., Que.	1	4	-	3	2	4	4	0	1	-	-	2	2
Normandin, Que.	0	4	0	2	1	0	3	0	0	0	3	0	3
L'Assomption, Que.	1	4	0	3	2	4	-	0	2	0	3	1	4
Fredericton, N.B.	0	2	0	4	1	0	4	1	0	0	2	4	0
Kentville, N.S.	1	2	4	1	0	0	3	1	3	0	0	1	3
Brule, N.S.	0	1	-	1	2	1	2	0	0	0	1	0	0
Knoydart, N.S.	0	0	-	-	0	1	3	0	0	-	-	0	0
Nappan, N.S.	0	3	-	-	0	0	4	0	0	-	-	0	2
Charlottetown, P.E.I.	0	4	0	3	3	2	t	0	2	3	-	1	4
Doyles, Nfld.	0	0	0	0	0	1	-	0	0	0	0	0	0

* A dash signifies that no observation was made.

1/ 1 = trace, 2 = light, 3 = moderate, 4 = heavy.
For the rusts 1 = tr. - 1%, 2 = 2 - 20%, 3 = 25 - 50%, 4 = over 50%

Distribution of Physiologic Races

Puccinia graminis f. sp. *tritici*

In 1958, 18 races and subraces were identified among 239 isolates of wheat stem rust. These races, with the number of isolates in brackets, are: race 2(2), race 10 (6), race 11 (26); race 11-1 (Can.) (3), race 15 (13), race 15B-1 (Can.) (12), race 15B-1L (Can.) (12), race 15B-4 (Can.) (36), race 29-1 (Can.) (15), race 29-2 (Can.) (1), race 32 (7), race 34 (2), race 36 (1), race 38 (3), race 48A (20), race 56 (77), race 59 (2), and race 87 (1).

The 1958 distribution of physiologic races of wheat stem rust differs little from the 1957 distribution. Race 56 was slightly more prevalent than 15B for the first time since 1949. The most prevalent and important subrace of 15B is 15B-4 (Can.) which was isolated frequently from the durum variety Ramsey in Man. (10 of 27 isolates). Race 11 was about as prevalent as last year but races 29-1 (Can.) and 48A increased slightly. This increase probably was exaggerated by the number of isolates from the selective variety McMurachy. Race 15 was isolated frequently from durum wheat in s. Man. Cultures of race 15 usually produced a completely susceptible reaction on Marquis, but sometines, especially in cool weather, a (2)+ reaction was produced, suggesting a resemblance to race 115. Race 15 has moderate virulence on Yuma.

The widespread cultivation since 1955 of the resistant variety Selkirk seems to have been an important factor contributing to the present stability of the race situation. From 1954 to 1956 the principal feature of the race distribution was the decline in prevalence of race 15B and the increase in prevalence of race 56. Also of interest was the appearance, mostly in 1954 and 1955, of a number of new biotypes or subraces. Some of these subraces such as 15B-3 (Can.) and 29-1 (Can.) appeared, on the basis of greenhouse tests, to threaten Selkirk, but they have not increased in prevalence. Race 15B-3 (Can.), potentially the most important of these races, has not been found in Canada since 1955. Apparently they have little virulence on Selkirk under field conditions usual in Western Canada.

Many isolates (171 of 239) were obtained from susceptible varieties not believed to exert a selective effect on the rust population. These isolates probably provide a more accurate estimate of race distribution (Table 9) than isolates from resistant and hence selective varieties. The data in Table 9 show that race 56 predominated to an even greater extent when only susceptible varieties are considered. A similar result was obtained in 1957 when isolates from susceptible varieties in Man. and Sask. were compared with isolates from all sources. The data from resistant varieties in Table 9 probably exaggerate all prevalence of race 15B-4 (Can.) because a large proportion of the isolates came from the variety Ramsey which is resistant to all other prevalent races. This race probably constituted about nine per cent of the rust population (Table 9). The varieties Kenya Farmer, Mida-McMurachy-Exchange II-47-26, Frontana-K58-Newthatch II-50-17, and Kenya 117A were resistant to all isolates.

Table 9. Number of isolates of different races obtained from resistant varieties, susceptible varieties, and all varieties in Canada in 1958, expressed as per cent

Race	Per cent of isolates from all varieties	Per cent of isolates from susceptible 1/ varieties	Per cent of isolates from resistant 2/ varieties
2	0.8	1.2	-
10	2.5	2.3	3.7
11	10.9	11.1	7.5
11-1	1.2	1.2	1.9
15	5.4	4.7	9.4
15B-1	5.0	4.1	5.7
15B-1L	5.0	5.8	-
15B-4	15.1	9.3	33.9
29-1	6.3	6.4	7.5
29-2	0.4	0.6	-
32	2.9	4.1	1.9
34	0.8	-	1.9
36	0.4	0.6	-
38	1.2	1.7	-
48A	8.4	5.3	18.8
56	32.2	39.8	7.5
59	0.8	1.2	-
87	0.4	0.6	-

1/ Varieties known to be susceptible to most races.
2/ Resistant varieties - Mindum, Ramsey, Golden Ball, unidentified durum wheat varieties, Lee, Thatcher, and McMurachy.

Puccinia recondita

Twelve races of wheat leaf rust were identified in the 1958 physiologic race survey. The races isolated are (number of isolates in brackets): 1(30), 5(10), 9(6), 11(47), 15(94), 28(3), 30(1), 35(12), 58(81), 68(1), 126(15), 140(4). Race 15 was the most prevalent race in Man. but was less abundant e. and w. of this province. Races 1 and 11 were more prevalent to the w. and race 58 was the dominant race in Eastern Canada. This distribution of races is similar to that of 1957.

Puccinia hordei

Twelve collections of barley leaf rust were studied in 1958. The races identified (number of isolations in brackets) are: race 4(8), race 44(4). The collections of race 44 were all made in Man. Race 4 was obtained from P.E.I., N.S. Ont., and B.C. Barley leaf rust is not important in Canada.

Puccinia graminis f. sp. avenae

The 1958 physiologic race survey of oat stem rust yielded 153 isolates which were resolved into 14 races. These races with the number of isolates in brackets are: race 1(8), race 2(14), race 5(4), race 6(13), race 6A(12), race 7(22), race 7A(24), race 8(15), race 8A(2), race 10(10), race 11(5), race 12(1), race 13(6), and race 13A(17).

In 1958, race group 1, 2 and 5, race group 7 and 12, and race group 8, 10 and 11 were about equally prevalent in Canada. In 1958 race 2 was more common and race 7 much less common than in 1957. Race 7A was frequently isolated in Man. where the variety Rodney, which is resistant to all other races found on the prairies, is widely grown. The most important feature of the 1958 survey was the reappearance of races 8A and 13A, first found in 1957, and the occurrence of a new race, 6A. Races 8A and 13A are like other cultures of races 8 and 13 except that they attack Rodney and Garry. Similarly, race 6A differs from other cultures of race 6 because it also attacks Rodney and Garry. It can, therefore, attack all commercial varieties which are dependent on genes, A, B, C, D, and E for their resistance.

Nine of the 12 isolates of race 6A were obtained from different varieties in a naturally infected rust nursery at Appleton, Ont.; the other isolates came from Kemptville, Ont., Ste. Anne de la Pocatiere, Que., and Ste. Anne de Bellevue, Que. Seven cultures of race 13A came from different varieties in the rust nursery at Appleton, Ont., three from different varieties at Merrickville, Ont., one from Kemptville, Ont., five from different varieties at Ste. Anne de la Pocatiere, Que., and one from L'Assomption, Que.

Puccinia coronata f. sp. avenae

In 1958, collections of crown rust were obtained from widely separated localities in Man., Ont., Que. and the Atlantic Provinces. Thirty-three races and subraces of crown rust were isolated from these collections. The races and subraces isolated (with numbers of isolations of each race and subrace given in brackets) were: 201 (1), 201A (3), 201B (2), 202 (1), 202A (3), 203 (4), 205A (1), 209 (6), 209A (6), 209B (1), 210 (1), 210A (10), 211A (11), 212 (2), 212A (2), 213 (1), 216 (9), 228 (1), 231 (1), 235A (1), 237A (1), 239 (3), 239B (1), 240 (2), 240A (2), 264 (4), 274 (21), 275 (1), 279 (5), 280 (4), 284 (1), 284A (1) and 293 (3).

Races pathogenic to Victoria (213, 216, 264, 275 and 279) comprised 35.6% of all isolates. The Landhafer races (264 and 293) comprised 6% of all isolates. These two groups of races were slightly less prevalent than last year but much more prevalent than they were prior to 1957.

Five isolates of races 235A and 280 were identified. These two races are of special interest because they are highly pathogenic to Ceirch du Bach, one of the few sources of resistance to the Victoria and Landhafer races. Sixty % of the isolates from Que. and the Maritime Provinces, 83% from Ont. and 88% from Man. were pathogenic to Garry oats. Thirty-five %, 67% and 75% of the isolates from Que. and the Maritimes, Ont. and Man. respectively, were pathogenic to Rodney.

Melampsora lini

Besides the collections obtained at the Experimental Stations in Man. several collections of flax rust were obtained in the only area in the province where flax rust was found in farm fields in 1958. A few flax rust collections were also received from six localities in Alta. No flax rust was received from B.C., Sask. and Eastern Canada. From the collections obtained the following six physiologic races (number of isolates of each race in brackets) were isolated: 1(6), 166(2), 180(6), 210(3), 238(1) and 242(1). These races have been isolated frequently in Canada in previous years and are of no particular importance as they cannot attack the predominant rust resistant varieties Marine, Redwood, Raja and Sheyenne.