LEAF RUST OF WHEAT IN CANADA IN 1964

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Disease development in western Canada

Leaf rust of wheat was severe at harvest time in Manitoba and south-eastern Saskatchewan. However, crop losses were small since much of the rust developed late in the season. Infections became lighter further west and no leaf rust was observed in eastern Alberta. Western Saskatchewan and eastern Alberta were dry in 1964 and moisture conditions were unfavorable for rust development. A slight development of leaf rust occurred in western Alberta where better moisture conditions prevailed.

Leaf rust in the rust nurseries

Severe infections of leaf rust occurred at nurseries in Manitoba, Ontario and Quebec (Table 2). Thatcher[6] x Transfer, which contains the gene from Aegilops umbellulata for leaf rust resistance, was highly-resistant at all locations in Canada.

Exchange and Frontana have been tested for many years and have been consistently resistant at all nurseries. These varieties have adult plant resistance to leaf rust and are being used in current breeding programs, both in Canada and the United States. Commercial varieties with this type of leaf rust resistance probably will be widely grown in a few years and the appearance of strains of leaf leaf rust virulent on these varieties can be anticipated.

Table 1. Distribution by geographic areas of physiologic races of Puccinia recondita isolated in Canada in 1964.

Race	Geographic Area							Total Isolates	Per cent of Total Isolates
	Maritimes	Que.	Ont.	Man.	Sask.	Alta.	B.C.		
3						2		2	0.7
5			1	6	1	1		9	3.2
9			1	1				2	0.7
11	1	5	6				2	14	4.9
15	2	11	24	96	59	5	2	199	70.1
35			1					1	0.4
58	3	12	30					45	15.8
126	1		1					2	0.7
161			1				9	10	3*5
	7	28	65	103	60	8	13	284	100.0

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Distribution of physiologic iaces

Nine races of wheat leaf rust were isolated in the 1964 race survey (Table 1). Race 15 was the most prevalent race in Canada and was markedly predominant in the prairie provinces. The leaf rust race survey in Manitoba yielded only three races, two of which, races 5 and 15, accounted for 102 of the 103 isolates which were identified. Only one culture of race 9, a markedly different race, was isolated.

The supplementary differential wheat varieties were changed in 1964 and a report on these changes will appear in Plant Disease Reporter. The NA65 set of supplementary differentials consists of Dular, Lee Waban, Sinvalacho, and Exchange. This set was used in the present race survey and the NA65 races 10 and 12, which attack the commercial varieties Selkirk and Pembina, constitute an appreciable proportion of the rust population.

Table 2. Per cent infection of leaf rust of wheat (Puccinia recondita) in 1964 on 12 wheat varieties in uniform rust nurseries at 33a/ locations in Canada.

Locality	Ramsey	Mindum	Red Bobs	Marquis	Kenya Farmer	Lee	That-4er	Selkirk	McMurachy	Thatcher x T I E	tana
Saanichton, B. C.	t	t	20	20	2	1	20	0	20	0	0	0
Agassiz, B.C.	0	0	30	30	1	1	30	1	60	0	0	0
Creston, B. C.	10	25	a5	85	15	15	85	50	85	0	0	0
Edmonton, Alta.	0	t	t	t	t	t	t	t	t	0	0	0
Scott, Sask.	0	0	t	t	0	0	t	0	t	0	0	0
Melfort, Sask.	0	0	5	2	t	t	2	t	2	0	0	0
Indian Head, Sask.	0	0	20	20	3	3	20	5	20	0	0	0
Brandon, Man.	0	t	50	40	30	30	60	40	60	0	0	0
Glenlea, Man.	0	1	80	70	20	20	80	50	80	0	1	0
Winnipeg, Man.	0	t	70	70	5	10	70	30	70	0	1	0
The Pas, Man.	0	0	90	50	20	20	90	60	80	0	0	0
Fort William, Ont.	0	0	a0	70	10,40	20	a0	20	80	0	0	0
Kapuskasing, Ont.	10	15	95	85	30,60	50	90	50	85	0	t	0
St. Catharines, Ont.	0	5	70	60	10	15	60	10	70	0	0	0
Guelph, Ont.	0	0	80	80	5	10	a0	5	80	0	t	0
Kemptville, Ont.	1	5	70	70	15	15	70	15	65	0	0	0
Merrickville, Ont.	20	20	90	90	20	20	90	25	90	0	t	0
Appleton, Ont.	0	t	90	90	30	35	90	15	90	0	0	0
Williamstown, Ont.	10	10	80	80	10	10	75	10	75	0	0	0
Verner, Ont.	15	20	90	80	5	10	90	10	a0	0	t	0
Alfred, Ont.	10	15	90	80	25	25	a5	20	80	0	t	0
Douglas, Ont.	0	0	t	t	0	0	t	0	t	0	0	0
Macdonald College, Que.	0	3	60	60	10	15	60	15	60	0	0	0
Lennoxville, Que.	0	0	75	60	1	5	65	5	70	0	0	0
La Pocatikre, Que.	t	1	90	75	25	25	a5	50	a5	0	0	0
Normandin, Que.	0	0	t	t	t	0	t	0	t	0	0	0
L'Assomption, Que.	t	5	90	90	45	45	80	50	85	0	1	0
Québec, Que.	-	-	a5	85	-	55	80	45	a5	0	-	-
Fredericton, N.B.	0	0	20	20	5	5	25	t	20	0	0	0
Kentville, N. S.	0	0	50	40	15	5	40	0	30	0	0	0
Nappan, N.S.	0	0	40	40	5	t	45	0	40	0	0	0
Boulardarie, N.S.	0	0	t	t	0	0	t	0	t	0	0	0
Charlottetown, P.E.I.	0	0	5	5	0	0	5	0	5	0	0	0

a/ Wheat leaf rust was not found on nurseries from Beaverlodge, Alta., Lethbridge, Alta., Lacombe, Alta., St. John's West, Nfld.

Table 3. Distribution by geographic areas of NA65 races of Puccinia recondita isolated in Canada in 1964.

Geographic Area	Number of isolates of indicated NA65 races								
	1	3	7	9	10	11	12	19	27
B.C.	2	10							
Alta.		1		4	1	1	1		
Sask.		2		35	8	7	9		
Man.	1			39	32	14	17		
Ont.	7	14	1	8	4	22	5	2	2
Que.	4	2		3	7	8	1		3
Maritimes	1	3		1		1		1	
Total Isolates	15	32	1	90	52	53	33	3	5

Table 4. Number of isolates of NA65 races found in certain standard physiologic races in 1964 in Canada.

NA65 Races	Standard Races								
	3	5	9	11	15	35	58	126	161
1			2	12	1				
3	1				8		12		9
7						1			
9	1	3		2	84				
10		1			51				
11		3			25				
12		2			30		27		1
19							1	2	
27							5		

Bulked collections of leaf rust uredospores from each area were used to inoculate a group of highly resistant wheat varieties which included Agrus, Transfer, Klein Lucero, Aniversario, South Africa 43, Wanken, C.I. 13523, Klein Titan, Maria Escobar, Rio Negro, Anex, Lani, Lofron, and Frex. Nine cultures were isolated from the resistant set; these cultures came from virulent pustules on Klein Titan, Maria Escobar and Rio Negro. No cultures were obtained with virulence on the other varieties of the resistant set.