AIR-BORNE RUST INOCULUM OVER WESTERN CANADA IN 1973[1]

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An estimate of the amount of air-borne cereal rust inoculum over Western Canada in 1973 was obtained by exposing Vaseline-coated microscope slides, held at 45° from the vertical, in spore traps, as reported in previous issues of the Canadian Plant Disease Survey. slides were exposed at Winnipeg, Morden, and Brandon, Manitoba, and at Indian Head, Regina, and Saskatoon, Saskatchewan (Table 1). The slides exposed at all spore trap locations except Saskatoon were prepared at Winnipeg and, after exposure, were returned to Winnipeg where the number of urediospores on each slide was counted using a microscope. Slides exposed at Saskatoon were prepared and examined by the staff of the Agriculture Canada Research Station, Saskatoon, Saskatchewan.

Despite widespread but light infections of stem rust (Puccinia sraminis Pers. f. sp. tritici Eriks. and E. Henn.) in the winter wheat area in the southern United States, few stem rust spores were carried into Western Canada during the critical period in May and June. It was early August before they appeared regularly on the slides and mid-August before an appreciable increase in their numbers occurred. The total number of stem rust spores counted on the slides was less than in 1972 and less than the average for the last 10 years (Table 1).

Wheat stem rust was scarce in Western Canada in 1973 and oat stem rust (P. graminis f. sp. avenae) did not develop on susceptible wild and cultivated oats until after August 7. It is likely that wheat stem rust, oat stem rust, and rye stem rust (P. graminis f. sp. secalis), which occurred commonly on Hordeum jubatum L., contributed about equally to the spore counts,

The number of leaf rust spores counted was similar to 1972 and generally much above the 10 year average. Leaf rust spores were carried into Western Canada in late May and during June. Their numbers increased rapidly during July and reached a peak about mid-August (Table 1). Wheat leaf rust (P.

Table 1. Number of urediospores of stem rust and leaf rust per square inch observed on Vaseline-coated slides exposed for 48-hour periods at three locations in Manitoba and three locations in Saskatchewan in 1973

Date	Winnipeg		Morden		Brandon		Indian Head		Regina		Saskatoon	
	Stem rust	Leaf rust	Stem rust	Leaf rust	Stem rust	Leaf rust	Stem rust	Leaf rust	Stem rust	Leaf rust	Stem rust	Leaf rust
May 22-23	0	0	0	0	0	0	0	0	0	0	0	0
24-25	0	0	0	0	0	0	0	0	0	0	0	0
26-27	0	0	0	0	0	0	0	0	0	0	0	0
28-29	1	1	0	0	0	0	0	1	0	0	0	0
30-31	0	0	0	0	0	0	0	4	0	5	0	0
May Total	1	1	0	0	0	0	0	5	0	5	0	0
June 1-2	0	136	0	31	0	32	0	1	0	1	0	0
3-4	0	4	0	0	0	10	0	1	0	2	0	0
5-6	0	1	1	1	0	2	0	1	0	4	0	0
7-8	0	0	0	6	0	1	0	1	0	1	0	0
9-10	0	1	0	0	0	1	0	1	0	1	0	0
11-12	0	0	1	0	0	0	0	1	0	1	0	0
13-14	0	56	0	172	0	8	0	57	0	50	0	0
15-16	0	41	0	84	0	48	0	19	0	11	0	0
17-18	0	4	0	0	0	1	0	0	0	2	0	0
19-20	0	2	0	2	0	2	0	2	0	2	0	7
21-22	0	0	0	2	1	2	0	4	0	2	0	13
23-24	0	4	0	0	3	12	0	20	0	91	0	45
25-26	0	19	0	19	0	21	0	13	0	18	0	9
27-28	1	7	0	30	0	1	0	8	0	2	0	12
29-30	0	5	0	1	0	0	1	17	0	17	0	2
June Total	1	280	2	348	4	141	1	146	0	205	0	88

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Table 1 (ctd.)

Date	Winnipeg		Morden		Brandon		Indian Head		Regina		Saskatoon	
	Stem rust	Leaf rust	Stem rust	Leaf rust	Stem rust	Leaf rust	Stem rust	Leaf rust	Stem rust	Leaf rust	Stem rust	Leaf rust
July 1- 2	0	35	0	106	0	28	0	8	1	29	0	3
3- 4	0	5	0	7	0	1	0	20	0	11	0	10
5- 6	0	62	0	42	0	9	0	12	0	8	0	20
7- 8	0	36	0	1*	0	19	0	11	0	6	0	11
9-10	0	16	0	29	0	9	2	64	0	72	0	56
11-12	0	252	0	262	0	236	0	80	0	60	0	27
13-14	0	34	0	79	0	70	0	36	0	13	0	12
15-16	0	157	0	1*	0	110	0	100	0	52	0	170
17-18	0	62	0	47	0	184	0	88	0	13	0	7
19-20	0	21	0	91	0	16	0	81	0	106	0	45
21-22	0	29	0	9	0	127	2	1,133	0	178	5	98
23-24	0	16	0	304	0	192	0	34	0	3	0	69
25-26	5	242	0	80	0	170	0	35	0	19	0	71
27-28	0	101	0	141	0	218	0	223	0	115	1	45
29-30	0	174	0	2*	0	403	2	191	0	178	1	74
31- 1	0	45	11	246	0	241	2	573	0	422	1	86
July Total	5	1,287	11	1,447	0	2,033	8	2,689	1	1,285	8	804
Aug. 2- 3	19	249	66	1,100	6	612	7	1,742	7	2,477	3	472
4- 5	7	725	2	6*	0	1,014	21	3,844	7	3,919	122	1,504
6- 7	0	189	0	1*	0	86	0	537	0	2,038	6	274
8- 9	40	751	16	290	9	870	0	388	2	825	1	121
10-11	39	456	5	259	0	178	0	1,810	2	4,953	9	244
12-13	4	33	0	4*	0	58	2	2,441	19	5,665	1	110
14-15	246	2,039	2	31*	12	724	9	1,008	0	12,162	13	595
16-17	185	969	120	558	28	607	80	1,198	53	22,961	20	766
18-19	139	1,403	157	1,808	148	2,308	18	1,404	12	1,747	1	204
20-21	54	104	25	152	13	170	47	447	201	40,194	3	271
22-23	72	168	84	322	142	246	104	797	246	70,327	47	618
24-25	194	447	239	772	15	180	106	1,344	428	5,866	8	119
26-27	533	1,031	260	460	251	5,663	81	593	453	11,217	3	79
28-29	181	340	162	304	262	821	60	266	393	7,838	6	94
30-31	427	718	692	1,880	438	739	171	708	631	10,379	7	84
Aug. Total	2,140	9,622	1,830	7,947	1,324	14,276	706	18,527	2,454	202,568	250	5,555
1973 Total	2,147	11,190	1,843	9,742	1,328	16,450	715	21,367	2,455	204,063	258	6,447
1963-72 Average	3,874	11,199	4,261	16,752	2,696	10,093	2,150	19,627	5,209	65,905	927	22,289

* Slide incorrectly exposed,

recondita Rob. ex Desm.) was observed in the field on June 14 and developed rapidly in Manitoba and southeastern Saskatchewan, diminishing to the north and west. The heavy infections and the large numbers of leaf rust spores on the slides were caused mainly by the susceptibility of the commercial varieties Manitou and Neepawa. The low total spore count at Morden was caused by some slides being improperly exposed. The spore trap results show that leaf rust was carried into Western Canada during late May and early June, caused primary infections that appeared about mid-June, and developed rapidly during July and early August.

Oat crown rust (P. coronata Cda. f. sp. avenae Eriks.) was observed early in July but did not develop rapidly until early August. It probably contributed to the leaf rust spore counts in Manitoba but its contribution was small compared with that of wheat leaf rust.