

## Stripe Rust (*Puccinia striiformis*, f. sp. *tritici*) Data – 2007 Spring Wheat Nurseries

The attached data was provided by Dr. Xianming Chen, Plant Pathologist, USDA/ARS, Pullman, WA that lists the stripe rust evaluations for soft white and hard (red/white) spring wheat varieties included in the 2007 WSU Extension Uniform Cereal Variety Testing Program nurseries. We appreciate the support that Dr. Chen provides on conducting these evaluations. The data represents stripe rust evaluations at six field sites managed by Dr. Chen in 2007: three sites (Loc 1, Loc 3, and Loc 4) are near Pullman in eastern Washington, one (Loc 5 at Mt. Vernon) in northwestern Washington, one (Loc 6 at Walla Walla) in southeastern Washington, and one (Loc 7 at Lind) in central Washington.

- Pullman, WA locations include:
  - WSU Spillman Agronomy Farm (location 01)
  - WSU Plant Pathology Farm (location 02)
  - WSU Whitlow Farm (location 04)

Included in the data is a listing of Infection Type (IT) {see discussion below} and Severity (%) – the percent of leaf area of a variety that is infected by stripe rust at the time of evaluation. In some situations there are two numbers separated by a comma (,) under the IT (infection type) column. When this occurs the majority of the plants of a variety have an IT represented by the first number and a few have IT represented by the second number. In addition to stripe rust, Dr. Chen reports on other foliar diseases when observed.

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**STRIPE RUST: INFECTION TYPES:** A 0-9 scale described below was used for recording infection types (ITs). Generally, an infection type (IT) from 0-4 shows necrotic symptoms with slight rust sporulation. Scores of 5-9 indicate damaging infection – the rust is continuing to develop and infect. **SEVERITY (%):** Severity is a percentage of the leaf area of a variety that is being infected with stripe rust. The following scale is described in: *Technical Bulletin Number 1788, Virulence, Aggressiveness, Evolution, and Distribution of Races of Puccinia striiformis (the Cause of Stripe Rust of Wheat) in North America, 1968-87, Feb. 1992*. Both scales are used in the data sets to depict the impact of stripe rust on varieties.

0 = no visible signs or symptom

1 = necrotic and/or chlorotic flecks; no sporulation

2 = Necrotic and/or chlorotic blotches or stripes; no sporulation

3 = Necrotic and/or chlorotic blotches or stripes; trace sporulation

4 = Necrotic and/or chlorotic blotches or stripes; light sporulation

5 = Necrotic and/or chlorotic blotches or stripes; intermediate sporulation

6 = Necrotic and /or chlorotic blotches or stripes; moderate sporulation

7 = Necrotic and/or chlorotic blotches or stripes; abundant sporulation

8 = Chlorosis behind sporulating areas; abundant sporulation

9 = No necrosis or chlorosis; abundant sporulation

Attached is the stripe rust data file for 2007 Spring Wheat Variety Trial Nursery. Except for Lind, we had adequate rust severity for reliable data in all locations. Most entries showed good level of resistance. Let me know if there are any questions. Thanks.

**TABLE XMC0732.** STRIPE RUST INFECTION TYPE (IT) AND SEVERITY (%) ON CULTIVARS AND LINES IN THE WSU EXTENSION UNIFORM CEREAL VARIETY SPRING WHEAT VARIETY TRIAL NURSERY (EXP32) AT SPILLMAN FARM (LOC 01), PLANT PATH FARM (LOC 03) AND WHITLOW FARMS (LOC 04) NEAR PULLMAN, MT VERNON (LOC 05); WALLA WALLA (LOC 06); AND LIND (LOC 07), WA WHEN RECORDED AT THE INDICATED DATES AND STAGES OF PLANT GROWTH IN 2007 UNDER NATURAL INFECTION. **Chen, X., Plant Pathologist, USDA/ARS, Pullman, WA., 2007.**

2007 ENTRY	IDENTITY	CLASS	VARIETY NAME	STRIPE RUST <sup>(1)</sup> ( <i>Puccinia striiformis</i> , f. sp. <i>tritici</i> )															
				Spillman Farm (Pullman)		Plant Path Farm (Pullman)		Whitlow Farm (Pullman)		Mt Vernon, WA		Walla Walla		Lind					
				LOC 01		LOC 03		LOC 04		LOC 05 <sup>(2)</sup>		LOC 06		LOC 07					
				7/20/07		7/12/07		7/11/07		5/31/07		7/9/07		6/22/07		6/14/07			
				FS 11.2 <sup>(3)</sup>		FS 10.4		FS 10.4		FS 5		FS 11.2		FS 11.1		FS 10.54			
IT	%	IT	%	IT	%	IT	%	IT	%	IT	%	IT	%						
<b>SOFT WHITE SPRING</b>																			
				<b>Lemhi (S check)</b>		<b>8</b>	<b>60</b>	<b>8</b>	<b>50</b>	<b>8</b>	<b>80</b>	<b>8</b>	<b>20</b>	<b>8</b>	<b>80</b>	<b>8</b>	<b>20</b>	<b>8</b>	<b>30</b>
1	WA 7677	SWH	ALPOWA	2	20	2	10	2	20	8	10	2-3	30	3	5	2	2		
2	WA 7850	SWH	ZAK	5	20	8	50	8	90	5	5	5	30	8	15	8	20		
3	WA007921	SWH	LOUISE	2	5	2	5	5	20	2	5	3	30	0	0	0	0		
4	WA 7183	SWH	WAKANZ	3	5	0	0	2	10	2	10	2	30	0	0	0	0		
5	BZ698-031	SWH	NICK	2	10	0	0	2	5	8	30	8	60	0.5	1	0	0		
6	WA008008	SWH	WA008008	3	5	0	0	2	5	5	10	5	30	0	0	0	0		
7	WA008039	SWH	WA008039	2	20	0	0	2	2	2	5	5	30	0	0	0	0		
8	WA008041	SWH	WA008041	2	5	0	0	2	2	2	10	0	0	0	0	0	0		
9	WA008046	SWH	WA008046	2	2	2	1	3	10	2	1	0	0	0	0	0	0		
10	WA008043	SWH	WA008043	2	5	0	0	2	2	2	2	0	0	0	0	0	0		
11	WA008044	SWH	WA008044	2	5	0	0	2	2	2	2	0	0	0	0	0	0		
12	ARS05S303	SWH	ARS05S303	2	2	0	0	2	2	2	5	3	20	0	0	0	0		
13	WA008059	SWH	WA008059	2	5	2	20	2	5	2	2	0	0	0	0	0	0		
14	IDO526	SWH	ALTURAS	2	5	0	0	2	2	8	10	5	20	0	0	0	0		
15	IDO642	SWH	UI CATALDO	3	5	0	0	0	0	5	5	5	20	0	0	0	0		
16	WA007902	WHCB	EDEN	5	30	5	30	8	40	8	10	8	60	5	5	8	10		
17	WA007989	WHCB	WA007989	3	15	0	0	3	20	2	5	0	0	0	0	0	0		
18	WA008047	WHCB	WA008047	2	10	2	1	3	10	5	5	3	30	0	0	0	0		
	WA008058 <sup>(4)</sup>	SW	WA008058***	2	5	2	5	2	5	2	1	2	10	0	0	0	0		
<b>HARD RED SPRING</b>																			
				<b>Lemhi (S check)</b>		<b>8</b>	<b>60</b>	<b>8</b>	<b>50</b>	<b>8</b>	<b>80</b>	<b>8</b>	<b>20</b>	<b>8</b>	<b>80</b>	<b>8</b>	<b>15</b>	<b>8</b>	<b>30</b>
1	WA007802	HRS	SCARLET	8	30	8	20	8	40	5	5	8	60	8	5	8	10		
2	WA007859	HRS	HOLLIS	3	20	0	0	2	2	8	30	5	50	0	0	0	0		
3	WA007824	HRS	TARA 2002	2	10	2	1	2	2	5	10	5	30	0	0	0	0		
4	WA007954	HRS	WA007954	2	5	0	0	0	0	5	5	5	20	0	0	0	0		
5	WA008013	HRS	WA008013	2	10	0	0	2	2	5	5	5	20	0	0	0	0		
6	WA008027	HRS	WA008027	2	10	0	0	2	2	5	10	5	30	0	0	0	0		
7	WA008030	HRS	WA008030	2	5	0	0	0	0	5	10	5	40	0	0	0	0		
8	WA008031	HRS	WA008031	2	5	2	1	0	0	8	20	5	30	0	0	0	0		
9	WA008034	HRS	WA008034	3	20	0	0	0	0	2	1	0	0	0	0	0	0		
10	GRANAR	HRS	GRANAR	3	10	5	10	8	60	5	10	0	5	2	0	0	0		
11	IDO462	HRS	JEFFERSON	2	5	2	1	0	0	5	10	5	30	0	0	0	0		
12	IDO566	HRS	JEROME	2	10	0	0	2	5	5	20	5	40	0	0	0	0		
13	WESTBRED 926	HRS	WESTBRED 926	2	5	0	0	2	5	5	20	5	40	0	0	0	0		
14	BZ 922-322	HRS	HANK	2	5	0	0	2	2	5	10	5	40	0	0	0	0		
15	BZ999-339	HRS	BZ999-339	2	5	0	0	5	5	8	30	5	40	0	0	0	0		
16	BZ9M03-1044	HRS	JEDD	2	5	2	1	3	20	5	30	5	30	0	0	0	0		
17	ACS52610	HRS	ACS52610	2	2	0	0	0	0	2	10	0	0	0	0	0	0		
18	95WV10616	HRS	CABERNET	2	5	0	0	0	0	2	1	0	0	0	0	0	0		
19	02W50076	HRS	RSI50076	2	2	0	0	2	2	2	5	0	0	0	0	0	0		
20	T0001052	HRS	BUCK PRONTO	2	5	0	0	3	10	5	30	8	60	0	0	0	0		
21	JEFF/PRONTO	HRS	JEFF/PRONTO	2	5	0	0	3	5	5	30	8	60	0	0	0	0		
<b>HARD WHITE SPRING</b>																			
				<b>Lemhi (S check)</b>		<b>8</b>	<b>60</b>	<b>8</b>	<b>40</b>	<b>8</b>	<b>80</b>	<b>8</b>	<b>40</b>	<b>8</b>	<b>80</b>	<b>8</b>	<b>15</b>	<b>8</b>	<b>30</b>
1	WA007899	HDWH	MACON	8	20	8	20	8	90	8	20	8	50	8	10	8	20		
2	WA007931	HDWH	OTIS	2	5	0	0	5	10	5	30	3	30	0	0	0	0		
3	WA008035	HDWH	WA008035	2	5	2	5	5	5	5	5	5	30	0	0	0	0		
4	WA008038	HDWH	WA008038	2	10	0	0	2	5	2	1	0	0	0	0	0	0		
5	WA008036	HDWH	WA008036	2	5	0	0	0	0	8	20	5	40	0	0	0	0		
6	IDO533	HDWH	LOLO	2	5	0	0	5	5	8	50	8	60	0	0	0	0		
7	BLANCA GRANDE	HDWH	BLANCA GRANDE	2	5	2	1	2	10	0	0	2	2	0	0	0	0		
8	BZ998447	HDWH	WAIKEA	2	5	0	0	2	2	5	10	3	30	0	0	0	0		
9	UC 1361	HDWH	CLEAR WHITE	2	5	2	1	2	5	5	20	2	10	0	0	0	0		
10	UC 1419	HDWH	PATWIN	2	5	0	0	2	2	2	5	3	10	0	0	0	0		
11	BZ903-445WP-d	HDWH	BZ903-445WP-d	2	5	0	0	3	10	5	20	3	20	-	-	0	0		
12	WQL9HDALP	HDWH	WQL9HDALP	3	5	2	20	5	80	8	1	3	30	3	5	0	0		
<b>HARD RED SPRING (Irrigated Only)</b>																			
				<b>Lemhi (S check)</b>		<b>8</b>	<b>60</b>	<b>8</b>	<b>60</b>	<b>8</b>	<b>90</b>	<b>8</b>	<b>10</b>	<b>8</b>	<b>80</b>	<b>8</b>	<b>5</b>	<b>8</b>	<b>30</b>
1	DA984-034	HRS	EXPRESS	2	2	0	0	2-3	10	8	30	3	30	0	0	0	0		
2	DA900-229	HRS	SOLANO	2	5	2	1	3	5	8	1	5	30	0	0	0	0		
3	EXPRESSO	HRS	EXPRESSO	2	2	0	0	2	2	2	1	0	0	0	0	0	0		
4	BZ904-336WP	HDWH	BZ904-336WP	2	5	0	0	3	5	8	30	8	60	0	0	0	0		
5	02W50603	HRS	RSI50603	2	10	5	1	3	5	2	1	0	0	0	0	8	10		
6	RSI20035	HRS	RSI20035	2	5	0	0	2	2	2	1	0	0	0	0	0	0		
7	240352	HRS	240352	2	2	2	5	5	20	8	40	3	20	0	0	0	0		

<sup>(1)</sup> Infection Type (IT) was recorded based on the 0-9 scale with ITs 8 and 9 combined as 8 (the most susceptible reaction) in field data. Generally IT 0-3 are considered resistant, 4-6 intermediate, and 7-9 susceptible. Heterogenous reactions of an entry were indicated by two or more ITs separated by ", " for most plants with the first IT and few plants with the second IT or connected with "-" for entries containing plants with continuous ITs. Entries with a high IT in the first note, but a low IT in the second note may indicate that they have high-temperature, adult-plant (HTAP) resistance.

<sup>(2)</sup> Entries with lower IT in the second note than that in the first note may indicate HTAP resistance.

<sup>(3)</sup> Feekes wheat development scale: 11.2 (soft dough); 10.54 (kernel watery); 5 (pseudostem erection); 11.1 (medium-milk).

<sup>(4)</sup> From Kulvinder Gill, WSU O.A. Vogel Edowed Chair in Wheat Genetics