WHEAT (*Triticum aestivum*)
Cephalosporium stripe; *Cephalosporium gramineum*

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Reaction of winter wheat cultivars and breeding lines to Cephalosporium stripe in Washington, 2012.

Field plots were sown at the Palouse Conservation Field Station in Pullman, WA in a Thatuna silt loam soil (pH 5.3) on 16 Sep 2011. Seed were sown at the rate of 90 lb/A in four-row plots, 3.0 ft wide by 15.6 ft long, with a 12-in. spacing between rows in a field managed in a 4-yr, chickpea (*Cicer arietinum* L.), spring wheat, fallow, winter wheat rotation. The experimental design was a randomized complete block with each genotype replicated four times. Prior to planting, seeds were treated with CruiserMaxx Cereals and Cruiser 5FS, 5.0 and 1.0 fl oz/100 lb seed, respectively. Based on soil test recommendations, 135 lb N and 10 lb Cl/A were applied on 30 Sep 2011. On 3 Oct 2011, Axiom DF (10 oz/A) was applied over the plot area with an electric pump sprayer, mounted on a 4-wheel ATV, equipped with 11 TeeJet XRC 8002 nozzles, on a 20-in. spacing, at 12.5 gal/A for the control of grassy weeds. On 13 Oct 2011, dry oat kernels colonized by a four-isolate mixture of *Cephalosporium gramineum* were broadcast on the soil surface at the rate of 180 lb/A. On 1 and 19 Jun, Tilt (4.0 fl oz/A) and NuChem 90-NF NIS (0.125% v/v) was applied over the plot area with a CO_2-pressurized (40 psi) backpack sprayer equipped with six TeeJet XR 11003 nozzles, on a 17-in. spacing, at 22 gal/A to control stripe rust (*Puccinia striiformis*). Disease incidence and severity were evaluated on 25 to 29 Jun by destructively sampling one ft of row when the majority of the plants were 50% kernel extended, Zadoks growth stage 70.5. Yield and test weight were determined by harvesting each plot with a small-plot combine on 17 Aug. A subsample of the grain was cleaned before test weight was determined.

Conditions were favorable for Cephalosporium stripe development during the winter 2011 to 2012, due to intermittent snow cover. Symptoms of Cephalosporium stripe developed in the spring of 2012, and based on the reaction of Stephens, a highly susceptible cultivar, disease pressure was severe. Due to average to slightly above average temperatures and above-average precipitation in Mar and Apr, conditions were moderately conducive for stripe rust development and warranted fungicide application. Timely fungicide applications provided good control of stripe rust, which prevented confounding Cephalosporium stripe ratings. Disease incidence, severity and index ranged from 26.9 to 95.5%, 2.7 to 3.9 and 24.2 to 94.3, respectively. Breeding lines MTS0826, MTS0808, ARS010780-3C, OR08047P94, WA8154, WA 8135 and SYN SWW-2 and the cultivar Eltan exhibited the lowest disease index (24.2 to 44.8) whereas breeding lines OR2071628, WA 8134, MTS0819, OR20800156H, ARS010762-2C, 02-10606A, WA 8142, ARS010746-2C, SYN HRW-2, OR2071071, ARS990077-1C, 01-10704A, SYN SWW-1 and cultivars SYN Ovation and Madsen exhibited the greatest susceptibility (69.8 to 80.8), which were statistically similar to Stephens (94.3). Even though precipitation was above average for Mar to Jun, *Cephalosporium gramineum* had a significant impact on yield and test weight. Yield and test weight were negatively correlated with disease index (r = -0.53387, P = <0.0001) and (r = -0.49409, P = <0.0001), respectively.

Genotype	Disease incidence[z,y] %	Disease severity[z,y,x] 0 to 4	Disease index[z,y,w] 0 to 100	Yield[y] bu/A	Test weight[y] lb/bu
MTS0826	29.6	3.7	24.2	86.4	63.7
MTS0808	35.0	3.7	32.9	108.2	62.0
ARS010780-3C	37.7	3.3	34.0	123.4	59.0
Eltan	52.2	2.9	36.9	103.2	56.1
OR08047P94	58.3	2.7	40.3	133.4	54.1
WA8154	46.7	3.6	42.0	112.2	59.4
WA8135	59.5	3.0	44.4	114.6	57.2
SYN SWW-2	54.2	3.3	44.8	130.9	57.6
03-28404A	57.6	3.5	51.4	123.2	58.1
ARS97230-6C	64.1	3.4	53.9	113.4	55.4
SYN HRW-1	58.0	3.7	54.5	76.2	60.6
Bruneau	58.8	3.7	54.6	88.5	56.3
MTS0832	58.9	3.8	55.2	78.9	62.1
SYN SWW-3	58.5	3.8	56.1	115.4	57.2
WA8152	74.5	3.1	58.6	114.0	56.3
WA8137	70.5	3.4	60.3	93.7	57.0
03-29902A	64.5	3.7	60.8	109.6	56.7
M70871	65.5	3.7	61.1	96.7	58.3
99-06202A	68.1	3.4	61.8	95.5	56.3
OR2080227H	76.6	3.4	65.6	84.0	52.4
ARS970161-3L	72.8	3.6	65.9	76.2	57.3
WA8153	78.9	3.3	66.1	97.6	53.7
OR2070870	81.4	3.3	66.6	105.4	55.2
Brundage 96	74.9	3.7	69.2	102.2	57.7
OR2071628	75.9	3.6	69.8	117.4	54.9
WA8134	76.8	3.6	70.2	116.1	54.4
MTS0819	73.1	3.8	70.3	86.3	60.8
OR2080156H	79.5	3.5	70.6	98.7	57.0
ARS010762-2C	77.9	3.6	71.2	88.7	54.1

02-10606A	72.7	3.9	71.2	55.7	57.5
WA8142	77.5	3.7	71.4	103.0	56.1
ARS010746-2C	81.5	3.5	71.4	97.3	53.5
SYN HRW-2	74.6	3.8	71.6	96.0	56.7
SY Ovation	77.2	3.8	74.3	106.8	55.5
OR2071071	83.6	3.6	75.3	89.6	50.7
Madsen	85.6	3.6	77.4	89.3	54.3
ARS990077-1C	86.3	3.7	79.4	87.3	56.3
01-10704A	86.8	3.7	80.4	75.8	50.4
SYN SWW-1	84.3	3.8	80.8	82.0	53.8
Stephens	95.5	3.9	94.3	45.9	55.1
$LSD_{0.05}$	26.2	0.3	24.7	17.9	2.6
Pr>F	0.0085	<0.0001	<0.0001	<0.0001	<0.0001

[z] Samples, consisting of one ft of row, were removed from each plot either 25 (replications 1 and 2) or 27 (replications 3 and 4) Jun 12 and transported to the farm equipment building where percentage of infected stems and disease severity, as reflected by the extent of colonization, was determined by visual inspection of each stem.

[y] Fisher's protected ($P = 0.05$) least significant difference (LSD) was used to compare treatment means. Means are based on four replicates.

[x] Disease severity was determined by rating individual stems for symptom severity using a 0 to 5 scale where 0 = no visual symptoms, 1, 2, 3, 4 being symptoms detected on the respective leaves of the plant, and 5 symptoms detected on the peduncle. No disease severity ratings of 5 were given in this trial.

[w] Disease index, which ranges from 0 to 100, was calculated by multiplying percent infected stems (disease incidence) by disease severity of infected stems and dividing by four.