

**Reaction of winter wheat cultivars and breeding lines to Cephalosporium stripe in Washington, 2013.**

Field plots were sown at the Palouse Conservation Field Station in Pullman, WA in a Thatuna silt loam soil (pH 5.5) on 13 Sep 2012. Seed were sown at the rate of 90 lb/A in four-row plots, 4.0 ft wide by 16.8 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, 133 lb N, 20 lb P, 13 lb S and 15 lb Cl/A were applied on 27 Sep 2012. On 28 Sept 2012, Axiom DF (8 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 18 Oct 2012, dry oat kernels colonized by a five-isolate mixture of *Cephalosporium gramineum* were broadcast on the soil surface at the rate of 180 lb/A. On 9 Apr, Goldsky (16 fl oz/A), PowerFlex (3.5 oz/A), Dagger (12 fl oz/A), Tilt (4.0 fl oz/A), Topsin (10 fl oz/A) and McGregor AMS Premium Blend MAX (1.5 lb/A) were applied at 12.5 gal/A for the control of broadleaf and grassy weeds as well as eyespot caused by *Oculimacula acufiformis* and *O. yallundae*. On 30 May, Tilt (4.0 fl oz/A) and McGregor Crop Oil M (32 fl oz/A) was applied over the plot area with a CO<sub>2</sub>-pressurized (40 psi) backpack sprayer equipped with six TeeJet XR 11002 nozzles-on a 17-in. spacing, at 17.6 gal/A to control stripe rust (*Puccinia striiformis*). Disease incidence and severity were evaluated from 1 to 5 Jul by destructively sampling one ft of row when the majority of the plants were between kernels being watery ripe to mid-milk, Zadoks growth stages 71 to 75. Yield and test weight were determined by harvesting each plot with a small-plot combine on 8 Aug. A subsample of the grain was cleaned before test weight was determined.

Conditions were favorable for Cephalosporium stripe development during the winter 2012 to 2013 due to intermittent snow cover. Symptoms of Cephalosporium stripe developed in the spring of 2013, 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 Apr, conditions were conducive for stripe rust development and warranted a fungicide application, which provided good control of stripe rust. Disease incidence, severity and index ranged from 57.1 to 100%, 3.3 to 4.0 and 48.2 to 100, respectively. Breeding line J98C0006[F] exhibited the lowest disease index of 48.2, which was significantly different from Eltan (63.1), the tolerant control. Breeding lines DAS001, WA8143, J98C0004[C] and cultivar Xerpha exhibited statistically similar disease indexes to Eltan (63.1 to 71.0). Twenty-seven of the entries exhibited susceptibility (89.8 to 99.4) that was statistically similar to Stephens (100). *Cephalosporium gramineum* had a significant impact on yield and test weight, which were negatively correlated with disease index ( $r = -0.55024$ ,  $P = <0.0001$ ) and ( $r = -0.54139$ ,  $P = <0.0001$ ), respectively.

Genotype	Disease incidence <sup>z,y</sup> %	Disease severity <sup>z,y,x</sup> 0 to 4	Disease index <sup>z,y,w</sup> 0 to 100	Yield <sup>y</sup> bu/A	Test weight <sup>y</sup> lb/bu
J98C0006 [F] .....	57.1	3.3	48.2	103.3	57.9
Eltan .....	66.9	3.8	63.1	132.5	55.4
Xerpha .....	75.6	3.4	65.7	130.4	53.4
DAS001 .....	70.3	3.9	69.3	114.3	56.5
WA8143 .....	77.6	3.6	70.3	130.2	56.2
J98C0004 [C].....	78.3	3.6	71.0	105.9	56.8
WA8155 .....	85.1	3.6	76.8	128.3	55.3
ARS Crescent .....	81.9	3.8	78.6	112.0	55.5
UI SRG .....	81.8	3.9	80.2	87.2	52.0
ARS Amber .....	86.0	3.8	82.4	99.6	53.0
MTS0808 .....	82.9	4.0	82.9	63.1	53.7
OR08047P94 .....	90.1	3.7	84.0	115.1	51.0
IDO816 .....	86.3	3.9	84.2	104.3	55.9
UI Silver.....	90.6	3.8	85.8	109.1	57.0
ARS970230-6C.....	92.3	3.8	87.0	104.7	55.5
OR2070870 .....	94.0	3.8	89.8	96.1	52.8
DAS002 .....	91.5	3.9	90.6	102.9	56.4
03PN087-15.....	92.5	3.9	90.7	90.3	50.5
WA008134 .....	93.1	3.9	91.6	110.3	53.7
JC1108.....	93.4	3.9	91.8	99.0	50.5
WA8172.....	93.9	3.9	92.1	95.7	51.6
Cara .....	94.6	3.9	92.3	100.3	51.5
MT08172.....	93.1	4.0	92.3	71.4	49.7
MTW08168 .....	93.2	4.0	92.8	77.1	51.7
ARS Chrystal.....	95.1	3.9	92.9	90.8	50.6
MT0978 .....	93.9	4.0	93.0	85.2	52.4
SYN 107 .....	94.0	4.0	93.8	90.7	50.5
07PN013#38.....	94.9	3.9	93.9	90.7	52.3
WA8177 (CF100091) .....	96.6	3.9	94.1	88.6	50.0
WA008151 .....	94.7	4.0	94.3	78.9	49.4
04PN047-7 .....	96.2	3.9	94.7	86.5	49.3

Madsen.....	96.9	3.9	94.9	78.5	49.0
Kaseburg (OR2071628) .....	96.7	3.9	95.3	87.4	47.8
J99C0004 [B].....	96.2	4.0	95.4	59.2	43.3
IDO869 .....	96.3	4.0	95.5	57.1	49.3
WA8171 .....	96.9	4.0	95.9	93.3	51.7
ARS Selbu.....	97.0	4.0	96.0	65.0	50.2
OR2071071 .....	97.8	3.9	96.4	74.0	43.5
OR2080924 .....	98.9	3.9	96.7	64.5	44.7
WA008153 .....	99.1	3.9	97.6	86.3	51.4
JC1103 .....	98.1	4.0	97.9	67.3	53.0
OR2080641 .....	100.0	4.0	99.4	67.2	45.9
Stephens .....	100.0	4.0	100.0	33.7	43.2
LSD <sub>0.05</sub> .....	12.8	0.1	12.2	8.1	2.5
Pr>F.....	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

<sup>z</sup> Samples, consisting of one ft of row, were removed from each plot either 1 (replications 1 and 2) or 3 (replications 3 and 4) Jul 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.

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

<sup>x</sup> Disease severity was determined by rating individual stems for symptom severity using a 0 to 5 scale where 5 = symptoms detected on the peduncle or a white head, 4 = symptoms detected in the flag leaf, 3, 2 or 1 = symptoms detected on the respective leaves below the flag leaf, and 0 = no visual symptoms. No disease severity ratings of 5 were given in this trial.

<sup>w</sup> 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.