

Reaction of winter wheat cultivars and breeding lines to Cephalosporium stripe in Washington, 2014.

Field plots were sown at the Palouse Conservation Field Station in Pullman, WA in a Thatuna silt loam soil (pH 5.4) on 12 Sep 13. Seed were sown at the rate of 90 lb/A in four-row plots, 4.0 ft wide by 17.1 ft long, with a 12-in. spacing between rows in a field managed in a 4-yr, chickpea (*Cicer arietinum*), spring wheat, fallow, winter wheat rotation. The experimental design was a randomized complete block with each genotype replicated four times. Prior to planting, seed were treated with CruiserMaxx Cereals and Cruiser 5FS, 5.0 and 1.0 fl oz/100 lb seed, respectively. Based on soil test recommendations, 117 lb N, 10 lb P, 20 lb S and 11 lb Cl/A were applied on 2 Oct 13. On 2 Oct 13, 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 7 Oct 13, dry oat kernels colonized by a three-isolate mixture of *Cephalosporium gramineum* were broadcast on the soil surface at the rate of 161 lb/A. On 10 Apr, Goldsky (16 fl oz/A), PowerFlex (3.5 oz/A), Rhomene MCPA (12 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. On 2 May, Tilt (4.0 fl oz/A) and Topsin (10 fl oz/A) were applied to control eyespot caused by *Oculimacula acufiformis* and *O. yallundae*. Disease incidence and severity were evaluated from 23 to 25 Jun by destructively sampling one ft of row when the majority of the plants were between kernels being extended 50% to early-milk, Zadoks growth stages 70.5 to 73. On 23 Jul, a hail storm resulted in heads being dislodged and impacting yield. Yield and test weight were determined by harvesting each plot with a small-plot combine on 30 Jul. A subsample of the grain was cleaned before test weight was determined.

Conditions were favorable for Cephalosporium stripe development during the winter 2013 to 2014 due to intermittent snow cover. Symptoms of Cephalosporium stripe developed in the spring of 2014, and based on the reaction of Stephens, a highly susceptible cultivar, disease pressure was moderately severe. Disease incidence, severity and index ranged from 46.1 to 93.8%, 2.4 to 3.8 and 27.8 to 87.8, respectively. Cultivar Bauermeister exhibited the lowest disease index of 27.8, which was significantly different from Eltan (44.8), the tolerant control. Breeding lines IDO1209, MT1078, OR2090473, WA8177 (CF100091) and OR2100082H, and cultivars Farnum and Xerpha exhibited statistically similar disease indexes to Eltan (41.7 to 56.6). Twenty-one of the entries exhibited susceptibility (66.7 to 87.8) that was statistically similar to Stephens (78.3). *Cephalosporium gramineum* had a significant impact on yield, which was negatively correlated with disease index ($r = -0.47168$, $P = <0.0001$). *Cephalosporium gramineum* had an impact on test weight, which was negatively correlated with disease index ($r = -0.14583$, $P = 0.0658$). Hail damage also impacted yield and must be considered when interpreting these data.

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
Bauermeister	46.1	2.4	27.8	98.4	59.0
IDO1209	58.3	2.9	41.7	89.0	60.4
Eltan	73.7	2.5	44.8	104.4	58.7
Xerpha	71.7	2.6	46.4	90.7	57.9
MT1078	62.9	3.0	47.9	98.5	57.6
Farnum	67.8	3.1	53.5	94.1	58.6
OR2090473	69.6	3.1	54.0	78.4	54.0
WA8177 (CF100091)	73.7	3.0	54.7	72.4	56.7
OR2100082H	78.0	2.9	56.6	57.0	57.6
WA8173	76.4	3.1	58.1	105.5	56.5
WA8212	81.3	2.9	58.6	70.7	56.7
WA8187	76.6	3.1	59.4	84.6	58.4
OR2080641	80.4	3.0	60.6	66.2	52.8
UI Silver	76.6	3.3	62.1	76.3	59.1
WA8176	83.5	3.1	65.2	70.0	54.3
Eddy	77.1	3.4	65.9	69.2	59.3
OR2080637	85.5	3.1	66.7	52.6	51.6
WA8142	87.3	3.1	67.2	75.2	58.7
Madsen	84.3	3.3	68.9	68.6	56.6
WA8203	84.7	3.4	71.1	91.3	56.7
WA8204	82.8	3.5	71.3	68.1	54.6
Finley	78.4	3.6	71.3	65.4	59.8
MT0978	88.8	3.3	73.2	68.1	59.7
WA8170	89.2	3.3	74.8	84.5	54.1
WA8188	85.5	3.5	74.8	78.1	58.3
MT1113	81.5	3.7	76.0	64.1	58.2
UI SRG	85.6	3.6	76.8	65.1	54.0
MT1117	92.8	3.4	77.5	69.5	57.3
Stephens	84.7	3.7	78.3	34.3	53.2
WA8169	91.4	3.4	79.0	83.9	52.7
OR2100081H	93.8	3.4	81.0	60.0	58.4

Brundage 96	91.5	3.5	81.1	65.7	51.8
IDO1108	87.3	3.7	81.2	86.6	54.9
UICF Grace	93.1	3.5	82.3	47.6	57.6
IDO1005	93.3	3.5	82.5	64.2	54.7
MT1138	91.2	3.6	82.8	55.3	55.9
OR2100073H	92.5	3.6	83.4	58.3	54.9
IDO1004	87.4	3.8	83.4	80.5	54.3
MT1090	93.1	3.6	83.8	56.5	57.0
IDO1101	91.6	3.8	87.8	83.5	57.4
LSD _{0.05}	13.3	0.3	12.0	10.5	1.4
<i>p</i> -value	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

^z Samples, consisting of one ft of row, were removed from each plot either 23 (replication 1), 24 (replications 2 & 3) or 25 (replication 4) Jun 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 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.

^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.