WHEAT (*Triticum aestivum*)
Eyespot; *Oculimacula acuformis* and *O. yallundae*

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Reaction of winter wheat cultivars and breeding lines to eyespot in Washington, 2020.

Sixty winter wheat cultivars and breeding lines were sown at the Plant Pathology Farm in Pullman, WA on 24 Sep 2019; Madsen was included as a resistant control and Eltan as a susceptible control. Seed was sown with a head-row seeder in two-row plots, 2.0 ft wide by 3.0 ft long, with a 12-in. spacing between rows in a field managed in a 2-yr, wheat-summer fallow rotation. The experimental design was a randomized complete block with each entry replicated three times. Seed was treated with CruiserMaxx Cereals and Cruiser 5FS, 5.0 and 1.0 fl oz/100 lb seed, respectively, prior to planting. On 6 Nov 2019, plots were inoculated with a conidial suspension (1.35×10^6/ml) containing approximately equal parts of three *Oculimacula acuformis* and three *O. yallundae* isolates using a CO_2-pressurized (50 psi) backpack sprayer equipped with four TeeJet 8010 nozzles-on a 12-in. spacing at 180 gal/A. Approximately 75 stems were sampled from each plot from mid- to late-Jun 2020. Growth stage ranged from 20 to 50% kernel extension near mid-spike (Zadoks growth stage 70.2 to 70.5). Eyespot severity was determined by evaluating stem bases, 1 to 2 internodes above the crown, for symptom severity using a 0 to 4 scale where 0 = no visual symptoms, 1, 2 and 3 = up to 25, 50 and 75% of the stem circumference colonized by a lesion(s), respectively, and a 4 = a stem with a lesion girdling the base. Disease severity is the weighted mean of all symptomatic stems and incidence is the percentage of stems with symptoms. Disease index was calculated by multiplying disease incidence by disease severity and dividing by four and ranges from 0 to 100. Data were subjected to analysis of variance using Proc GLM of SAS v9.4 (SAS Institute, Cary, NC) and means separated with Fisher's protected LSD (P=0.05).

Overall eyespot pressure was moderately severe based on the disease index of Eltan (70.7), the susceptible control. Eyespot incidence, severity, and index ranged from 29.3 to 97.6%, 1.6 to 3.4, and 12.6 to 83.0, respectively. Sixteen entries had statistically similar disease indexes (12.6 to 40.2) to Madsen (26.8), the resistant control. Of those, six varieties (LWW15-71945, Rosalyn, LWW16-71088, OR2x2 CL+, WA 8293, and Resilience CL+) had disease indexes numerically less, but not statistically different than Madsen. Twelve entries had a disease index numerically greater, but not significantly different than Eltan, the susceptible control.

Variety	Disease incidence [z] %	Disease severity [y] 0 to 4	Disease index [x] 0 to 100
LCS Blackjack (LWW15-71945)	32.2	1.6	12.6
Rosalyn	29.3	1.8	14.9
LWW16-71088	41.6	1.6	16.7
OR2x2 CL+ (ORI2150031 CL+)	48.2	2.0	23.8
WA 8293	53.3	2.0	26.1
Resilience CL+	51.1	2.1	26.2
Madsen - control	52.1	2.0	26.8
Nixon (OR2121086)	56.2	2.2	30.4
VI Bulldog	61.9	2.0	31.7
Puma	61.0	2.1	32.1
ARS09X492-6CBW	60.5	2.1	32.4
Pritchett	69.9	1.9	33.8
08PN030-3	68.6	2.0	34.4
VI Frost	61.6	2.3	34.6
Devote (WA 8271)	62.8	2.3	37.0
WA 8307	71.9	2.2	39.8
UI Sparrow	65.1	2.4	40.2
WA 8289	72.6	2.3	42.2
IDO1608 HRW	75.5	2.3	43.8
Stingray CL+ (WA 8275 CL+)	72.8	2.4	44.0
YS-201	76.3	2.3	44.0
WA 8309	75.1	2.4	44.8
WA 8287	75.7	2.4	45.2
ARS-Castella (ARS20060123-31C)	78.4	2.4	47.2
WA 8306 CL+	77.0	2.5	49.0
WA 8308	77.0	2.6	50.5
WA 8290	80.1	2.5	51.1
WA 8317	83.0	2.6	54.3
Purl (WA 8234)	79.5	2.7	54.6
11PN044#84	84.6	2.6	54.6
Appleby CL+ (ORI2161250 CL+)	84.6	2.6	56.0
WA 8305 CL+	83.2	2.7	56.4
IDO1906 HWW	89.0	2.5	56.7
UIL 17-6268 CL+	89.1	2.6	57.0
WA 8316	90.0	2.6	57.6
IDO1808 SWW	86.6	2.8	60.2
UIL 17-6451 CL+	87.3	2.8	60.9
Farnum	87.1	2.8	61.1
IDO1810 SWW	90.2	2.9	64.3

UIL 17-6834 CL+	90.5	2.8	64.7
Sequoia	90.3	2.9	65.1
UI Bronze Jade (IDO 1706)	90.9	2.9	65.7
Scorpio (WA 8268)	90.5	2.9	66.0
SY Dayton	89.3	3.0	66.9
aMaze	93.3	2.9	68.0
LCS Rocket	88.2	3.1	69.4
Eltan - control	93.8	3.0	70.7
WB4311	91.9	3.1	70.9
WB1529	94.8	3.0	71.7
WA 8310	91.8	3.1	72.0
Keldin	93.9	3.1	73.8
AP Redeye (05PN044-20)	96.1	3.1	73.9
IDO1806 HWW	96.4	3.2	76.8
LCS Ghost (LWW14-74143)	96.1	3.2	77.2
IDO1607 HRW	97.6	3.2	77.6
IDO1506 HWW	94.6	3.4	79.5
WB4394	96.3	3.3	80.6
WA 8318 CL+	96.6	3.4	81.6
LCS Zoom (LWW14-73915)	96.9	3.4	83.0
LSD[w] (5%)	14.4	0.40	14.3
P > F	0.0001	0.0001	0.0001

[z] Samples consisting of approximately 75 stems from each plot were removed mid- to late-Jun 2020, transported to the Plant Pathology farm building, and stored at 39°F until they were rated for percentage of infected stems and disease severity, as reflected by presence of symptoms and extent of colonization determined by visual inspection of each stem.

[y] Eyespot severity was determined by rating stem bases, 1 to 2 internodes above the crown, for symptom severity using a 0 to 4 scale where 0 = no visual symptoms, 1, 2, and 3 = up to 25, 50, and 75% of the stem circumference colonized by a lesion(s), respectively, and a 4 = a stem with a lesion girdling the base.

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

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