

Reaction of winter wheat cultivars and breeding lines to eyespot in Washington, 2019.

Forty-two winter wheat cultivars and breeding lines were sown at the Plant Pathology Farm in Pullman, WA on 27 Sep 2018; 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 15 Nov 2018, plots were inoculated with a conidial suspension (2.5×10^6 /ml) containing approximately equal parts of four *Oculimacula acuformis* and four *O. yallundae* isolates using a CO₂-pressurized (50 psi) backpack sprayer equipped with four TeeJet 8010 nozzles-on a 12-in. spacing at 180 gal/A. Approximately 50 stems were sampled from each plot, early- to mid-June 2019. 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 evaluated 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 mild to moderate based on the disease index of Eltan (19.8), the susceptible control. Eyespot incidence, severity, and index ranged from 4.5 to 48.6%, 1.0 to 2.0, and 1.5 to 24.2, respectively. Although conditions during autumn and winter 2018-19 were favorable for eyespot development, late-winter snow cover beginning in February that lasted to the end of March delayed crop development and likely resulted in less severe disease than long-term averages in these plots. Twenty-six entries had statistically similar disease indexes (1.5 to 10.4) to Madsen (1.9), the resistant control. Disease indexes for UI Castle CL+ rated numerically less, but not statistically different than Madsen, the resistant control. Two entries, WA 8275 CL+ and LWW14-72916, had a disease indexes 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 |
|--------------------------------|-------------------------------------|---|--|
| UI Castle CL+ | 4.5 | 1.2 | 1.5 |
| Madsen - Control | 7.0 | 1.0 | 1.9 |
| Dyna-Gro Impact | 7.8 | 1.0 | 2.1 |
| ARS09X492-6CBW | 9.1 | 1.1 | 2.5 |
| ARS-Crescent | 11.7 | 1.0 | 3.1 |
| ARS-Castella (ARS20060123-31C) | 11.3 | 1.2 | 3.3 |
| Otto | 10.5 | 1.2 | 3.3 |
| WB1532 | 12.4 | 1.3 | 4.1 |
| Pritchett (4J0713366C) | 10.7 | 1.5 | 4.5 |
| LCS Artdeco | 13.8 | 1.4 | 4.7 |
| Jasper | 13.6 | 1.3 | 4.8 |
| Puma | 17.3 | 1.2 | 5.2 |
| WB1783 | 18.7 | 1.3 | 6.1 |
| WA 8268 | 15.9 | 1.6 | 6.2 |
| M-Press | 18.2 | 1.4 | 6.7 |
| WA 8271 | 18.6 | 1.5 | 6.8 |
| SY Raptor (SY 46#16) | 23.1 | 1.3 | 7.8 |
| SY Candor (09PN008#72) | 21.7 | 1.4 | 8.0 |
| Norwest Duet (LOR-092) | 21.6 | 1.5 | 8.2 |
| WB1604 | 23.2 | 1.4 | 8.3 |
| SY Ovation | 27.9 | 1.2 | 8.5 |
| Resilience CL+ (WA 8187) | 22.8 | 1.5 | 8.7 |
| Purl (WA 8234) | 24.8 | 1.4 | 8.8 |
| LCS Jet | 25.9 | 1.4 | 9.2 |
| SY Banks (SY 09PN005#25) | 22.8 | 1.6 | 9.3 |
| WB1376CLP | 27.0 | 1.4 | 9.8 |
| SY Assure | 24.3 | 1.6 | 9.9 |

| | | | |
|---------------------------|-------------|------------|-------------|
| LCS Aymeric | 23.5 | 1.6 | 10.4 |
| WB4303 | 30.5 | 1.7 | 13.4 |
| SY Touchstone | 34.4 | 1.6 | 13.8 |
| PNW Hailey | 34.2 | 1.6 | 13.9 |
| ARSDH08X117-83C | 32.8 | 1.7 | 14.2 |
| UI Magic CL+ | 32.8 | 1.7 | 15.2 |
| LCS Drive (LWW12-7105) | 36.2 | 1.8 | 15.6 |
| SY Command (SY 04PN066-7) | 32.7 | 2.0 | 16.0 |
| Stephens | 37.4 | 1.8 | 17.0 |
| Norwest Tandem | 37.7 | 1.9 | 17.9 |
| LCS Rocket (NSA10-2196) | 39.8 | 1.8 | 18.2 |
| SY Clearstone CL2 | 35.8 | 1.8 | 18.3 |
| Eltan - Control | 42.7 | 1.9 | 19.8 |
| WA 8275 CL+ | 42.2 | 1.9 | 21.3 |
| LWW14-72916 | 48.6 | 1.9 | 24.2 |
| LSD ^w (5%) | 16.3 | 0.4 | 9.4 |
| <i>P</i> > <i>F</i> | <0.0001 | <0.0001 | <0.0001 |

^z Samples consisting of approximately 50 stems from each plot were removed early- to mid-June 2019, transported to the 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.