WHEAT (*Triticum aestivum* 'Eltan: Hill 81' 1:1 mixture)
Eyespot; *Oculimacula acuformis* and *O. yallundae*

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Evaluation of fungicides to control eyespot in winter wheat, 2020.

A 1:1 mixture of winter wheat cultivars Eltan and Hill 81 was sown at the Plant Pathology Farm in Pullman, WA on 19 Sep 2019 using a Great Plains grain drill with rows on 12-in. centers into a field maintained in a three-year rotation of winter wheat, spring legume, and fallow. Plants were inoculated on 6 Nov 2019 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. On 8 Apr 2020 the field was subdivided into plots 8 ft wide by 20 ft long oriented perpendicular to the planting direction using wire flags. Treatments were arranged as a randomized complete block design replicated four times. Fungicides were applied the same day with a CO_2-pressurized (48 psi) backpack sprayer equipped with five TeeJet XR 8002 nozzles-on a 19-in. spacing, at 15 gal/A. Environmental conditions at the time of application were: wind calm, relative humidity 29%, air temperature 58°F, and 6-in. soil temperature 51°F. Induce NIS (0.25% v/v) was included in each treatment. Plant growth stage on the day of fungicide application was pre-jointing (Zadoks growth stage 29). Approximately 100 stems were sampled from each plot in mid-Jun 2020 when 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. Yield and test weight were determined by harvesting a portion (5 ft by 20 ft) of each plot with a small plot combine on 14 Aug 2020. A subsample of the grain was cleaned before test weight was determined in a GIPSA-approved filling hopper and one-pint container. 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 disease pressure was moderately severe based on disease index of the non-treated control (75.1). Disease incidence, severity, and index ranged from 57.5 to 96.4%, 2.5 to 3.4, and 35.8 to 81.9, respectively. Yield and test weight ranged from 90.3 to 111.9 bu/A and 57.8 to 59.6 lb/bu, respectively. Only plots treated with Miravis Ace had significantly lower disease incidence, severity and index than the non-treated control. Yield and test weight for plots treated with Miravis Ace at the 7.0 oz. rate was significantly greater than the non-treated control and all other treatments, except the 13.7 oz. rate of Miravis Ace, which had greater yield and test weight than most other treatments but was not significantly different than the non-treated control. Disease incidence, severity, index, yield, and test weight for all other treatments were not significantly different from the non-treated control or each other.

Treatment[z]	Rate, fl. oz/A	Disease incidence [y] %	Disease severity[x] 0 to 4	Disease index[w] 0 to 100	Yield bu/A	Test weight lb/bu
Non-treated	-	93.7	3.2	75.1	92.1	58.5
Aprovia Ace 1.665 EC	7.0	93.3	3.2	75.4	90.3	58.3
Aprovia Ace 1.665 EC	13.7	96.2	3.4	81.9	91.2	58.3
Miravis Ace 2.301 SE	7.0	73.3	2.7	49.0	111.9	59.6
Miravis Ace 2.301 SE	13.7	57.5	2.5	35.8	104.2	59.0
Tilt 3.6 EC + Topsin M 4.5FL	4 + 10	92.8	3.1	73.0	92.0	58.3
Trivapro 2.21 SE	9.4	96.1	3.3	78.1	91.1	58.0
Trivapro 2.21 SE	13.7	96.4	3.3	79.9	92.2	57.8
LSD[v] (5%)		10.5	0.2	9.7	12.2	1.0
P > F		0.0001	0.0001	0.0001	0.0144	0.0439

[z] All products were applied with 0.25% (v/v) NIS as Induce.

[y] Samples consisting of approximately 100 stems were removed from each plot and transported to the farm building where the percentage of infected stems and disease severity, as reflected by extent of colonization, was determined by visual inspection of each stem.

[x] Disease severity was determined by rating stem bases, 1-2 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.

[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.

[v] Fisher's protected (*P* = 0.05) least significant difference (LSD) was used to compare treatment means within columns. Means for incidence, severity, index, and test weight are based on four replicates; mean for yield is based on three replicates.