Efficacy of Fungicides at Different Application Timings to Manage Fusarium Head Blight in Hard Red Spring Wheat

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Objective:

To evaluate the efficacy of fungicides at different application timings to manage Fusarium head blight in Hard Red Spring Wheat (HRSW).

Methods:

Location: NDSU Langdon Research Extension Center

Experimental design: Randomized complete block, replicated four times.

Previous crop: Canola

Cultivars of HRSW tested: WB Mayville

Planting: 1.5 million pure live seeds/acre planted on May 20, 2020. A border plot was planted between treated plots to minimize interference from spray drift.

Plot size: Seven rows at six inch spacing, 5 ft. x 20 ft., mowed back to 5 ft. x 16 ft.

Herbicides applied: Axial XL (16.4 oz/A) + Huskie (13 oz/A) applied on June 17, 2020.

Inoculation: Plots were inoculated by spreading corn spawn inoculum at approximately boot stage (Feekes 9-10) at the rate of 300 g/plot.

Disease development: Supplemental moisture was provided by running overhead irrigation from booting to soft dough stage at the rate of one hour per day to create a conducive environment for FHB development.

Fungicide treatments: Fungicides were applied with a CO_2-pressurized backpack sprayer with a three nozzle boom (XR-8002) and the water volume used was 20 GPA. Fungicide (Miravis Ace) application was made at full head emergence on July 2nd. Miravis Ace, Prosaro and Caramba were applied at 10% flowering (anthesis) on July 6th and repeated 5 days after the first spray (July 11th). Refer to Table 1 for the treatments, rates and application timings.

Disease assessment: Data on FHB incidence was obtained by counting the number of heads showing FHB symptoms out of 50 heads at hard dough stage. FHB head severity was rated using 0-100% scale on arbitrary 50 heads, excluding two outer rows. FHB index (Index) was calculated using formula: Index = (SEV*INC)/100.

Harvest: Plots were harvested on September 2nd with a small plot combine and the yield was determined at 13.5% moisture.

Data analysis: Statistical analysis was done using Agrobase Generation II software. Fisher's least significant difference (LSD) was used to compare means at p ($\alpha = 0.05$). Means were presented in the table for simplicity of understanding.

Table 1: Efficacy of fungicides at various application timings to manage Fusarium Head Blight on Hard Red Spring Wheat.

		Fusarium Head Blight			Yield	Test Weight
Treatments and their application timings	**Rate (Fl Oz/A)**	**Incidence (%)**	**Severity (%)**	**Index**	**bu/A**	**lbs/bu**
Non-Treated Check	Check	73	20	15	53	55
Prosaro at 10% flowering	6.5	23	8	2.0	57	57
Caramba at 10% flowering	13.5	23	7	1.9	50	54
Experimental 1 at 10% flowering	7.3	10	3	0.3	56	56
Miravis Ace at complete head emergence	13.7	24	7	2.3	62	58
Miravis Ace at 10% flowering	13.7	16	4	0.7	72	60
Miravis Ace 4-5 days after 10% flowering	13.7	12	4	0.5	66	58
Miravis Ace at 10% flowering + Prosaro 4-5 days after 10% flowering	13.7+6.5	5	2	0.1	74	59
Miravis Ace at 10% flowering + Tebuconazole 4-5 days after 10% flowering	13.7+4	12	4	0.5	70	58
Miravis Ace at 10% flowering + Caramba 4-5 days after 10% flowering	13.7+13.5	6	3	0.2	66	58
Experimental 2 at 10% flowering	6.5	15	5	0.7	66	57
	Mean	**20**	**6**	**2.2**	**63**	**2**
	CV %	**47**	**41**	**83**	**12**	**2**
	LSD	**13**	**4**	**2.7**	**11**	**2**
	P- Value (0.05)	**0.00001***	**0.00001***	**0.00001***	**0.001***	**0.00001***

***** Indicates treatments are statistically significant.

Note: All treatments were applied with NIS @ 0.125 v/v.

Results: All the fungicide treatments at different application timings were statistically significant from that of the non-treated check among the variables tested except yield**.** Application of Miravis Ace at 10% flowering plus Prosaro 4-5 days after 10% flowering was the best treatment (Table 1).

Funded by: US Wheat and Barley Scab Initiative Project.