

Evaluate Miravis Ace Efficacy at Different Timing Applications to Manage Fusarium Head Blight in Hard Red Spring Wheat

Venkat Chapara, Amanda Arens and Andrew Friskop

Objectives:

1. Evaluate Miravis Ace vs Prosaro on Fusarium head blight (FHB) in hard red spring wheat (HRSW).
2. Evaluate Miravis Ace efficacy at different timings.

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/A planted on May 9, 2019. 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 Fl. oz/A) + Huskie (15 Fl. oz/A) + Prowl H₂O (36 Fl. oz/A)

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

Disease development: Supplemental moisture was provided by running overhead irrigation from Feekes 9 to 11.2.5 at the rate of one hour per day to create a conducive environment for FHB development.

Fungicide treatments: Fungicides were applied with a CO₂-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 3rd. Miravis Ace, Prosaro and Caramba were applied at Feekes 10.5.1 (anthesis) on July 5th and repeated 5 days after the first spray (July 10th) based on protocol recommendations. Refer to Table 1 for the treatments, dosages and application timings.

Disease assessment: Data on FHB incidence was obtained by counting the number of heads showing FHB symptoms out of 50 heads. 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 4th with a small plot combine and the yield was determined at 13.5% moisture.

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

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

Treatments	Application Timing	Rate Oz/A	Fusarium Head Blight				Yield (bu/A)
			Incidence (%)	Severity (%)	Index	DON (ppm)	
NON-TREATED CONTROL	CHK	CHK	99.5	31.2	31	5.7	49.5
PROSARO	FKS 10.51 (EARLY-ANTHESIS)	6.5	57	10.9	6.94	3.42	57.2
MIRAVIS ACE + PROSARO	FKS 10.51 + 3-7 DAYS	13.7 + 6.5	9.5	4.05	0.43	0.86	74.8
MIRAVIS ACE + CARAMBA	FKS 10.51 + 3-7 DAYS	13.7 + 13.5	7	3.5	0.36	0.83	73.5
MIRAVIS ACE	FKS 10.3 (FULL HEAD EMERGENCE)	13.7	42	16.45	6.77	4.53	62.9
MIRAVIS ACE	FKS 10.51 (EARLY-ANTHESIS)	13.7	29.5	8.4	2.91	1.94	70.4
CARAMBA	FKS 10.51 (EARLY-ANTHESIS)	13.5	53	10.85	6	2.83	64.18
MIRAVIS ACE	3-7 DAYS AFTER ANTHESIS		21.5	7	1.55	0.6	77.22
		Mean	39.8	11.54	6.99	2.58	66.2
		CV (%)	37.9	45.2	54.8	56.5	6.37
		LSD	22.3	7.7	5.6	2.13	6.2
		p-Value (0.05)	0.00001*	0.00001*	0.00001*	0.0003*	0.00001*

* Indicates treatments are statistically significant.

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

Results: Treatments of Miravis Ace applied at full head emergence and at anthesis resulted in equal performance on managing Fusarium head blight. However, Miravis Ace applied at 3-7 days after anthesis was the best performer of the parameters tested such as FHB Index, DON content and yield in this research trial (Table 1).

Funded by: US Barley and Wheat Scab Initiative Project and Syngenta.