Efficacy of Fungicides to Manage Fusarium Head Blight in Hard Red Spring Wheat

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A field study was planted on May 23, 2025, at the Langdon Research Extension Center. The experimental design was a randomized complete block with four replications. Plots consisted of six rows, spaced six inches apart, with a row length of 20 feet. These were trimmed to 15 feet for harvest. The variety 'WB 9590' HRSW was seeded at a rate of 1.2 million pure live seeds per acre. A non-treated border plot was planted between treated plots to minimize spray drift interference. The previous crop was canola. No pre-emergent herbicide was applied. A post-emergent herbicide application included Huskie FX (18 fl oz/a), Axial Bold (15 fl oz/a), and Prowl (2.5 pt/a) was applied on June 11, 2025.

Corn spawn inoculum was distributed across the plots at the boot stage (Feekes 9-10) at a rate of 300 g per plot. To promote Fusarium Head Blight (FHB) development, supplemental moisture was applied daily for 1 hour from head emergence to the soft dough stage (Feekes 10.5 to 11.25). Fungicides were subsequently administered using a CO_2 backpack sprayer with a three-nozzle boom (XR8001) at 40 psi and a water volume of 15 GPA. The initial fungicide application occurred at Feekes 10.51 (10% flowering) on July 10 (wind speed 11 MPH, 80°F at 11:30 am). The second application, 4 days after the first (4 DAF), involved Prosaro Pro, Sphaerex, and Tebuconazole for treatments 9, 10, and 11, respectively, which had previously received Miravis Ace at the 10.51 stage. Treatment 12 was sprayed with Sphaerex at 4 DAF. All 4 DAF applications were conducted on July 14, 2025 (wind speed 9 MPH, 72°F at 2:30 pm).

Percent FHB incidence was calculated by counting the number of heads showing FHB symptoms out of 50 randomly selected heads. The two outer rows in the plot were excluded. FHB severity was rated on a 0-100% scale based on those same heads. FHB index was calculated using the formula: Index=(SEV*INC)/100. Plots were harvested on August 29th with a plot combine. Yield and test weight were determined. Statistical analysis was carried out using Genovix Generation II software. Fisher's least significant difference (LSD) was used to compare means at p (α = 0.05).

Results

Compared with the non-treated check, all the fungicides evaluated were effective in managing percent incidence, severity, index, and DON of Fusarium Head Blight (FHB), except for the low and high rates of the fungicide, 'Badge'. The treatment with Miravis Ace followed by Prosaro Pro resulted in the lowest FHB incidence. This was closely followed by Miravis Ace followed by Sphaerex when sprayed at the respective application stages (Table 1). These treatments each have received two sprays during the flowering season. FHB severity, index, DON, yield, and test weight in the remaining treatments also showed significant differences from the non-treated check. This validates the effectiveness of the treatments. The treatment 'experimental compound' led to the highest yields, highlighting its potential practical implications. In contrast, the lowest yield was recorded in the low and high rates of 'Badge', which was even lower than that of the non-treated check (Table 1).

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	**Rate (Oz/A)**	**% Incidence**	**% Severity**	**INDEX**	**DON (ppm)**	**(bu/A)**	**(lbs/bu)**
Non-Treated Check	0	62	7	4	7	52	58
Prosaro	8.2	14	1	0.2	1	59	60
Experimental	8.59	15	1	0.2	1	64	59
Miravis Ace	13.7	18	2	0.3	2	60	60
Prosaro Pro	10.3	11	1	0.1	1	58	59
Sphaerex	7.3	14	1	0.1	1	58	59
Badge SC Low rate	19.2	53	5	2	5	42	57
Badge SC High rate	29	61	5	3	5	42	57
Miravis Ace fb Prosaro Pro	13.7+10.3	9	1	0.1	1	59	59
Miravis Ace fb Sphaerex	13.7+7.3	10	1	0.1	1	62	59
Miravis Ace fb Tebuconazole	13.7+4	15	1	0.2	1	62	60
Sphaerex (4 DAF)	7.3	21	2	0.6	2	59	60
	Mean	**25**	**2**	**1**	**2**	**56**	**59**
	CV %	**40**	**49**	**82**	**49**	**7**	**2**
	LSD	**14**	**2**	**1.2**	**2**	**6**	**1**
	P-Value (0.05)	**0.00001***	**0.00001***	**0.00001***	**0.00001***	**0.00001***	**0.00001***

Note: All treatments were applied with non-ionic surfactant (NIS) @ 0.125 v/v.

*Indicates significant difference

4 DAF: 4 Days after first spray

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