

Evaluation of various Fungicides to Manage Fusarium Head Blight in Barley

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Objective: Evaluate various fungicides for their efficacy on barley to manage Fusarium head blight (FHB).

Methods:

Location: NDSU Langdon Research Extension Center

Experimental design: Randomized complete block, replicated four times.

Previous crop: Canola

Cultivar of barley on which the treatments were tested: Tradition

Planting: 1.25 million pure live seeds/A planted on May 8, 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. Application timings: Sprayed at Feekes 10.5.1 stage repeated in treatment of Prosaro after 4-5 days of first spray. Likewise, Proline was sprayed after 4-5 days of first spray. 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 August 19th 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 Prosaro at various application timings to manage Fusarium head blight on barley.

Treatment	Rate (Oz/A)	Fusarium Head Blight				Yield (bu/A)
		% Incidence	% Severity	Index	DON (ppm)	
NON-TREATED	CHK	79.5	8.4	21.4	14.5	76.18
PROSARO + NIS	8.2	10.5	1.4	0.76	2.6	91.11
Coded Product	10.3	13.5	11.2	1.4	3.7	92.43
PROSARO + NIS (TWICE)	4.1	12	5.6	0.8	2.0	77.65
PROSARO + NIS; PROLINE + NIS	6.5+4.3	6.5	2.8	0.42	1.9	58.10
PROSARO + BAYTHROID + NIS	8.2+1.6	18	14	1.9	2.9	75.25
	Mean	23.33	9.6	4.4	4.6	76.00
	CV%	50.37	89.5	205	40.6	8.50
	LSD	17.71	12.95	13.8	2.8	9.80
	p-Value(0.05)	0.00001*	NS	0.03*	0.00001*	0.0042*

* Indicates treatments are statistically significant

Note: All treatments were applied with Non-Ionic Surfactant @ 0.125 v/v.

Results: Treatments of fungicides applied at different timings resulted in equal performance on managing Fusarium head blight (FHB); Prosaro applied at "Full head emergence" stage was the best treatment of the parameters tested in this research trial (Table 1).

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