Management of Fusarium Head Blight in Durum Wheat Cultivars with Fungicides

Venkat Chapara, Amanda Arens, and Andrew Friskop

Objective: To evaluate the efficacy of fungicides in single and sequential applications to manage Fusarium head blight (FHB) in durum wheat.

Methods:

Location: NDSU Langdon Research Extension Center.

Experimental Design: Randomized complete block with four replications.

Previous crop: Soybean

Cultivars of durum tested: Carpio and Divide

Planting: 1.2 million pure live seeds/A was planted on May 2, 2016. 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: Prowl H_2O (36 Fl. oz/A) + Sierra (1 Fl. oz/A) + Huskie (15 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 11.25 at the rate of one hour per day to create a conducive environment for FHB development.

Fungicide treatments: Fungicides were applied, with CO_2-pressurized backpack sprayer with a three nozzle boom (XR-8002) and the water volume used was 20 GPA. Fungicide application was made at Feekes 10.51(anthesis) on July 11 and repeated 4 days after the first application (July 15, 2016).

Disease Assessment: FHB incidence was calculated by counting the number of heads showing FHB symptoms out of 50 heads that were rated for severity. 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 24 with a small plot combine and the yield was determined.

Data Analysis: Statistical analysis was done using SAS. Fisher's least significant difference (LSD) was used to compare means at p (α = 0.05). Actual means are presented in the table for simplicity of understanding.

Results:

Both durum varieties had the lowest FHB incidence, severity, index, DON content, FDK, and yield when treated with the combination fungicide treatments applied at Feekes 10.51 and repeated 4 days after the first application (Table 1) and were significantly different from the untreated (inoculated and non-inoculated) checks.

Table 1: Fungicides tested alone and in combinations on two durum varieties at two application timings to manage Fusarium head blight and evaluation of their influence on yield and other grain characteristics: toxin (DON) content, FDK, and test weight.

Durum		Dosage		Fusarium Head Blight			DON	FDK	Yield	Test Weight
Variety	Fungicide	Fl. oz/A	Application timing	Incidence (%)	Severity (%)	Index	(ppm)	(%)	(bu/A)	(lbs/bu)
Carpio	Untreated check (Inoculated)	…	…	91	39	36	12.5	4	14	51
Carpio	Prosaro	6.5	Anthesis	71	24	18	14.5	4	35	54
Carpio	Prosaro+Caramba	6.5 + 14	Anthesis+4 days after anthesis	23	9	3	2.8	5	55	58
Carpio	Caramba+Folicur B	14 + 4	Anthesis+4 days after anthesis	31	17	5	4.5	4	47	56
Carpio	Proline+Folicur B	5.7 + 4	Anthesis+4 days after anthesis	32	14	5	2.0	4	58	58
Carpio	Untreated check (non-inoculated)	…	…	86	42	36	9.5	10	14	51
Divide	Untreated check (Inoculated)	…	…	89	41	36	18.3	5	12	50
Divide	Prosaro	6.5	Anthesis	77	29	23	12.5	4	33	53
Divide	Prosaro+Caramba	6.5 + 14	Anthesis+4 days after anthesis	36	14	6	3.5	4	53	56
Divide	Caramba+Folicur B	14 + 4	Anthesis+4 days after anthesis	58	23	14	4.5	4	46	55
Divide	Proline+Folicur B	5.7 + 4	Anthesis+4 days after anthesis	56	18	11	3.2	4	48	56
Divide	Untreated check (non-inoculated)	…	…	91	56	55	13.8	3	21	51
			Mean	**62**	**27**	**21**	**8.6**	**5**	**36**	**54**
			CV %	**20**	**30**	**39**	**49.9**	**49**	**18**	**2**
			LSD (5%)	**18**	**12**	**12**	**6.2**	**3**	**9**	**3**
Note: Untreated check (non-inoculated) received no artificial inoculum										
DON: Deoxynivalenol										
FDK: Fusarium Damaged Kernels										

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