

Evaluating Fungicide Efficacy and Timing for Management of Fusarium Head Blight in Spring Barley in North Dakota

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OBJECTIVE

•Evaluate fungicide efficacy and timing on reducing deoxynivalenol (DON) levels and protecting spring barley yield.

INTRODUCTION

•North Dakota is a leader in spring barley production and produced over 67 million bushels in 2015 (NASS, 2015).

•Fusarium head blight (FHB) continues to be one of the most economically important diseases in barley production.

•Well-timed fungicides are an essential component to managing FHB and DON in spring barley.

MATERIALS AND METHODS

•Experiments were conducted in 2014 and 2015.

•Trials were seeded with a susceptible two-row or six-row spring barley variety in a randomized complete block design at three ND locations:
-Carrington Research Extension Center (CREC)
-Fargo (FAR)
-Langdon Research Extension Center (LREC)

•CREC and FAR were inoculated with *Fusarium graminearum* infested corn spawn and trials at CREC were seeded into wheat residue.

•Several fungicide chemistries and timings were evaluated across locations.

•Disease severity on flag leaves was evaluated at each location.

•DON levels (CREC 2015 still in progress) and yield were obtained at season's end.

•Disease did not develop in 2014 FAR and data is not presented.

•Analysis of variance was used in the general linear models procedure within the SAS 9.4 program.

•2014 and 2015 LREC DON data were combined (Levene's test of homogeneity).

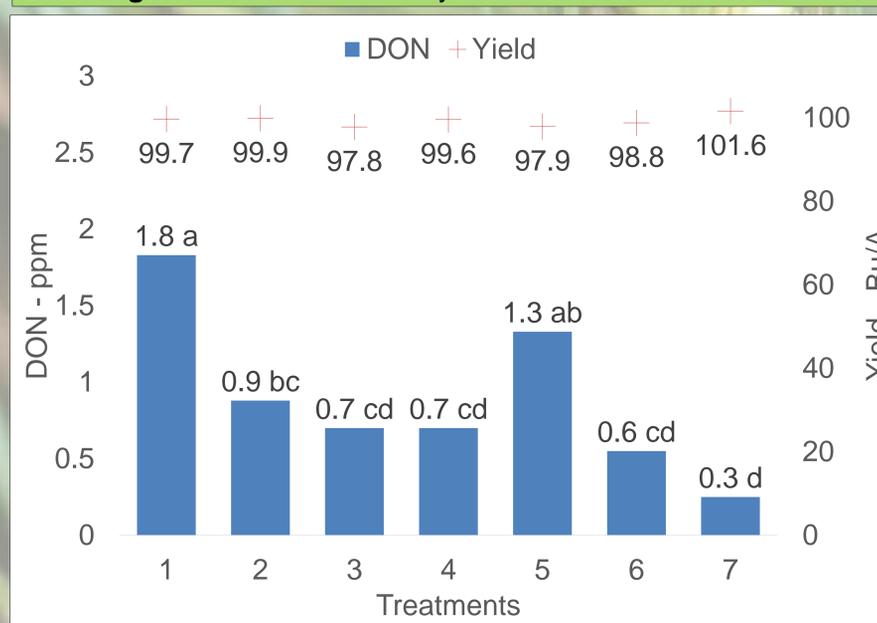
RESULTS

Table 1. Mean flag leaf severity, DON and yield values for CREC in 2014.

Treatment	Rate	Timing	Flag Leaf Severity (%)	DON (ppm)	Yield (bu/A)
Non-treated Control			66.3 a	1.45 bc	115.5 c
Pyraclostrobin	7.5 oz/A	Feekes 9	9.5 d	0.78 d	131.3 ab
Metconazole	13.5 oz/A	Feekes 10.5			
Trifloxystrobin + Propiconazole	7.0 oz/A	Feekes 9	16.5 d	0.58 d	134.2 ab
Tebuconazole + Prothioconazole	7.3 oz/A	Feekes 10.5			
Tebuconazole	4.0 oz/A	Feekes 9	26.5 b	1.75 ab	129.0 ab
Pyraclostrobin + Metconazole	8.0 oz/A	Feekes 9	17.0 bcd	1.90 ab	130.0 ab
Fluoxastrobin + Flutriafol	5.0 oz/A	Feekes 9	19.5 bcd	2.13 a	127.1 ab
Pyraclostrobin	7.5 oz/A	Feekes 10.3	12.5 cd	1.93 ab	126.4 b
Prothioconazole	5.0 oz/A	Feekes 10.3	18.5 bcd	1.05 cd	130.0 ab
Fluoxastrobin	3.0 oz/A	Feekes 10.5	25.5 b	1.80 ab	128.7 ab
Tebuconazole + Prothioconazole	7.3 oz/A	Feekes 10.5	18.0 bcd	0.65 d	129.4 ab
Metconazole	13.5 oz/A	Feekes 10.5	22.5 bc	0.78 d	126.0 b
		<i>LSD</i> _{p≤0.05}	10.2	0.63	7.6

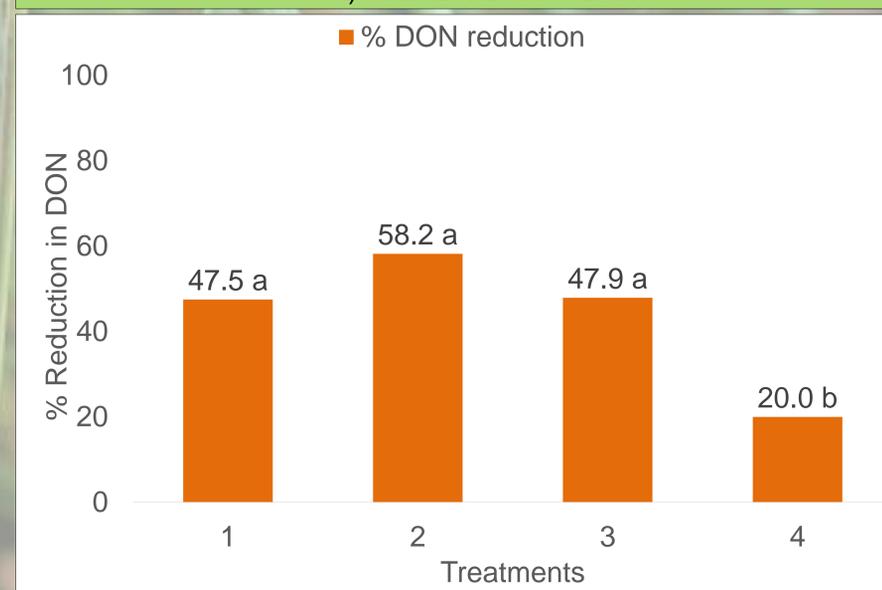


Figure 1. Mean DON and yield values for FAR in 2015.



1 = Non-treated Control
2 = Metconazole (13.5 oz/A) @ Fks 10.5
3 = Tebuconazole + Prothioconazole (6.5 oz/A) @ Fks 10.5
4 = Teagro (5.2 oz/A) @ Fks 10.5
5 = Tebuconazole (4 oz/A) @ Fks 10.5
6 = Metconazole (13.5 oz/A) @ Fks 10.5 + 5 days
7 = Tebuconazole + Prothioconazole (6.5 oz/A) @ Fks 10.5 + 5 days

Figure 2. Mean percent DON reduction (compared to non-treated control) at LREC 2014 & 2015.



1 = Metconazole (13.5 oz/A) @ Fks 10.5
2 = Tebuconazole + Prothioconazole (6.5 oz/A) @ Fks 10.5
3 = Teagro (5.2 oz/A) @ Fks 10.5
4 = Tebuconazole (4 oz/A) @ Fks 10.5

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DISCUSSION

- Triazole chemistries applied at Feekes 10.5 often had statistically lower DON levels than the non-treated control.
- DON differences often occurred among triazole chemistries when applied at Feekes 10.5.
- Strobilurin chemistries applied singularly at Feekes 10.3 or 10.5 had statistically similar or higher DON values than the non-treated control
- Although only tested at one location, triazole chemistries applied at Feekes 10.5 + 5 days applications had statistically similar DON values compared to triazole chemistries applied at Feekes 10.5.
- Next year's trials will focus on adding more post-anthesis applications and evaluating their merit in spring barley production.