Fusarium Head Blight Survey 2015

Nathan M. Kleczewski Ph.D. Extension Plant Pathologist, Field Crops.
University of Delaware Department of Plant and Soil Science and Cooperative Extension

Fusarium head blight (FHB) is the most damaging disease throughout wheat growing areas in the United States. Rainy weather just prior to flowering through 10 days after flowering provides opportunities for spores of the fungus to grow into florets and enter the wheat head. Once the fungus enters the head, it can grow in the water conducting tissues, choking off water and nutrient movement. This results in bleaching of the individual floret or portions of the head above the infection point. The fungus can also produce a mycotoxin (DON or vomitoxin) which can contaminate grain. DON levels exceeding 2ppm are often docked by elevators and higher levels can be rejected. Research has shown that Fusarium head blight is best managed by 1) planting a moderately resistant wheat variety and 2) using a fungicide for FHB suppression (Prosaro, Proline, Caramba) applied during a 6 day window from the start of flowering. Integration of these two methods can suppress Fusarium head scab severity and DON by 70% when compared to untreated, susceptible checks. Our goal is to help wheat producers in the region improve wheat quality and ultimately profitability by improving management of Fusarium head blight. *The objective of this project is to document potential impacts of management practices (variety selection, fungicide use, irrigation, rotation, and or tillage) at the field level over a two to three year span. This information, is then shared with the participants and can assist in increasing grower knowledge and profitability in the long term.*

This spring, a 24 wheat fields were surveyed across Delaware or the Delaware / Maryland boarder for FHB severity and vomitoxin levels. Information on variety, irrigation history, and use of fungicide were noted. Approximately 15-20 days after flowering, ten heads were randomly sampled from 30 feet of row at ten sites within each field. Approximately 15 days later, the same sampling strategy was used to collect wheat heads. These samples were hand threshed and sent to the University of Minnesota Mycotoxin lab for assessment of vomitoxin (DON). These data are summarized in **Table 1**. Your field numbers have been provided to you in a separate document. Our DON values may differ slightly from those you encountered in these same fields, as samples were taken before harvest. Rain and other environmental factors occurring after our sampling and harvest may have increased DON in a particular field after we obtained samples.

Overall, the season was not conducive to FHB in the majority of Delaware and Maryland due to dry weather during the flowering period. Grain elevators were reporting negligible DON levels in the vast majority of loads received. This was evident in the fields included in this survey as none of the 24 fields surveyed exceeded the 2ppm DON threshold at sampling. DON values ranged from <0.05 to 1.8ppm. Although levels were low, FHB index was reduced over 52% in moderately resistant varieties when compared to susceptible varieties (0.45 vs 0.85). In addition, DON was reduced roughly 22% in moderately resistant varieties when compared to susceptible varieties (0.29 vs 0.37ppm). Fungicide applications at anthesis were associated with reductions in FHB severity (0.33 sprayed vs 3.54 in unsprayed fields) and DON (1.26ppm sprayed vs 0.22ppm in unsprayed fields). Irrigation only slightly increased DON (0.38 irrigated vs 0.33 unirrigated) although in some fields, DON and FHB levels differed significantly between irrigated and unirrigated areas of the same field. See Fields **5 and 6** for such a comparison. Fields 9-12 provide another illustration of irrigation effects on FHB and DON. As you look at the data, it may help to look at the relative differences between treatments or management practices, not the absolute numbers. In a dry year like 2015, it was rare to see major issues, but trends or percent reduction compared to say, the 5 fields with the greatest FHB or DON, may give you an indication of performance in a more disease-conducive season.

Table 1. Field number, agronomic data, and FHB data for 24 fields assessed for FHB and DON in 2015. Overall weather was not conducive to FHB, but trends in FHB and DON were noted between management practices.

Field	FHB Resistance Rating*	Fungicide at Anthesis	Irrigation	Anthesis Fungicide	FHB Index	DON[z]
1	S	y	n	y	0	0.05
2	S	y	n	y	0.16	0
3	MR	y	n	y	0.24	0
4	S	y	n	y	0.16	0.07
5	**S**	**y**	**y**	**y**	**1.53**	**0.82**
6	**S**	**y**	**n**	**y**	**0.08**	**0.05**
7	MR	y	y	y	0.16	0
8	S	y	y	y	1.3	0.06
9	MR	y	y	y	0.42	0.87
10	MR	y	n	y	0.16	0.15
11	MR	y	y	y	2.09	0.77
12	MR	y	n	y	0.05	0.05
13	S	y	n	y	0.01	0.35
14	S	y	n	y	0.07	0.06
15	S	y	y	y	0.06	0.21
16	S	y	y	y	0.2	0.18
17	S	y	n	y	0.02	0.15
18	S	y	n	y	0.08	0
19	S	y	n	y	0.2	0.26
20	S	n	n	n	6.3	1.8
21	S	n	n	n	2.52	0.69
22	S	n	n	n	1.8	1.3
23	MR	y	y	y	0.035	0.2
24	S	y	y	y	0.04	0.3

* based off of industry ratings

[z] a 0 indicates that the reading was below the detection limit of 0.05 ppm DON