

2016 Fusarium Head Blight Screening Nursery Results

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Overview

The misted nursery is a tool used to assess variety response to Fusarium head blight (FHB). The most significant losses due to FHB occur when flowering heads are infected with spores of the FHB pathogen, resulting in yield loss and probable elevation in vomitoxin (DON). Flowering occurs at different times in different varieties. Consequently, varieties may not be at a highly susceptible stage in development when environmental conditions favoring FHB infections occur (Figure 1). In addition, some seasons, conditions for FHB may not be favorable, resulting in little FHB and DON. The misted nursery helps to avoid these issues by prolonging the conditions that may be favorable for FHB infection, reducing the chance that varieties will escape infection due to sub-optimal environmental conditions and promoting disease development. In addition, because many companies provide ratings based only on their own standards, the misted nursery allows for head to head comparison of FHB responses across seed sources. The misted nursery data presented here should be used, in combination with data from the Virginia Tech Misted Wheat Nursery, to help guide growers in selecting high-yielding wheat varieties with moderate resistance to FHB and in particular, DON.

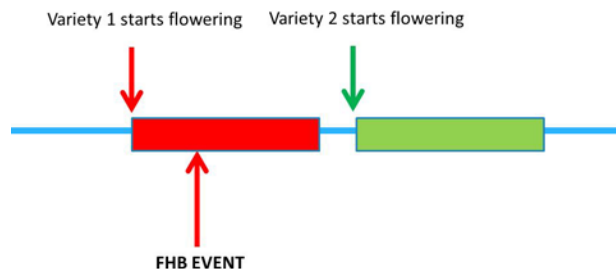


Figure 1. Varieties of wheat can vary significantly in maturity and flowering date. If natural conditions were used to assess FHB response, some varieties may escape disease, appearing to be moderately resistant, because they were not at the appropriate developmental stage when the FHB outbreak occurred. In addition, if conditions were not favorable for FHB during the growing season, little to no FHB may be observed.

Methods

The misted nursery was planted at Beltsville, MD, in a randomized complete block design with three replications. Entries were evaluated in 7-row plots that were trimmed to 5-feet in length prior to inoculation. A seeding rate of two million live seed per acre was used. Recommended fertility and pest control measures were followed in the establishment and management of the tests. The field was artificially inoculated with corn kernels infested with aggressive *F. graminearum* isolated from infected wheat grain when plants reached approximately FGS 9. To increase infection by *F. graminearum* spores the field was misted for two, 20-minute intervals every night, with the intervals spaced 100 minutes apart, from inoculation until seven days before harvest. Plots were visually rated for symptoms of FHB approximately 21 days after flowering. Plots were harvested and samples were sent to the UMN wheat lab for assessment of DON.

Results

Table 1. DON, incidence (heads with any FHB symptoms), severity (amount of head with symptoms), and index (overall amount of plot with symptoms) for the 2016 wheat misted nursery trial located in Beltsville, MD. **Green = DON levels statistically similar to MR standard Jamestown. Dark green = reduced DON by >45% compared to MS/S standard, Shirley.**

Variety	DON (ppm)	Incidence (%)	Severity (%)	Index
MBX 15-E-229	7.9	36.0	14.1	5.1
MAS#67	8.9	34.7	19.0	7.0
FS 860	8.9	41.3	19.5	7.9
MAS#66	10.7	52.0	25.6	12.8
USG 3197	12.3	38.7	16.9	7.0
SW 59SR	12.5	37.3	23.8	8.6
FSX 871	12.6	29.3	23.3	7.4
JAMESTOWN	13.2	54.7	36.4	20.5
L 11941	14.2	45.3	15.1	7.0
SS8530	14.5	26.7	25.4	6.5
SY VIPER	14.9	62.7	25.9	15.5
SSEX 8550	16.5	52.0	15.9	8.8
15 MDX 19	16.6	45.3	21.5	10.4
15 MDX 20	16.9	36.0	23.1	8.3
15 MW 134	17.4	48.0	14.1	6.7
SY 007	17.5	56.0	22.8	13.8
P 25R50	17.6	45.3	22.6	10.2
15 MW 133	17.7	48.0	20.3	9.9
USG 3201	18.0	48.0	18.2	8.7
SS8340	19.7	41.3	17.9	7.3
DG 9223	20.7	53.3	25.4	13.7
MBX 14-S-210	20.7	57.3	28.7	16.6
DG 9522	20.9	62.7	20.0	13.1
FSX 870	21.0	64.0	25.6	16.4
FS 854	21.1	52.0	21.3	11.2
15 MW 315	21.1	48.0	27.4	12.8
L 3677	21.4	77.3	31.5	24.4
USG 3316	21.9	46.7	25.1	12.8
USG 3523	21.9	49.3	19.0	9.6
SS8513	22.5	48.0	34.4	17.7
MBX 16-B-203	22.7	68.0	28.2	18.5
USG 3404	22.9	54.7	22.8	13.1
USG 3013	23.4	49.3	19.5	9.8

MAS#6	24.9	56.0	27.2	16.1
15 MW 64-134	25.0	60.0	38.2	23.2
FSX 872	25.1	60.0	36.2	22.2
WX 16771	25.9	38.7	21.8	8.6
DG SHIRLEY	26.4	57.3	37.4	21.5
DG 9692	26.6	53.3	18.2	10.3
MBX 14-K-297	26.7	68.0	21.3	14.5
HILLIARD	26.8	70.7	30.8	21.6
SW 63SR	26.9	62.7	24.9	15.9
MAS#7	27.4	64.0	25.9	16.6
MBX 11-V-258	28.0	64.0	31.3	20.5
VA12W-72	29.2	57.3	22.1	13.0
USG 3895	29.8	77.3	29.7	23.3
FS 865	31.1	62.7	21.5	13.4
SY 547	31.5	42.7	22.6	9.6
USG 3251	31.8	65.3	27.7	18.0
MBX 16-A-206	33.1	80.0	25.4	20.3
SS8360	33.6	58.7	30.8	18.6
SS8415	48.9	80.0	51.5	40.9
MAS#425	50.5	72.0	21.5	15.6
DG 9552	53.8	77.3	28.5	22.0
FS 850	57.4	89.3	53.3	47.7
P 25R40	60.6	68.0	36.9	25.0
SY 483	97.2	69.3	39.0	29.0

Discussion

Growers should use this misted nursery data as a tool for selecting wheat varieties, but should understand that multiple sources of misted nursery results will provide more confidence in variety response. Growers should compare these responses with those available from other misted nurseries, which can be located at the scabsmart variety webpage: http://scabsmart.org/soft_red_winter_wheat_southern_region. Ultimately, continued use of a misted nursery in our region will allow for multi-year assessment of varieties.

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