

WHEAT (*Triticum aestivum*; multiple cultivars)
Fusarium head blight; *Fusarium graminearum*

J. Antholz¹, M. Bruce¹, K. W. Jordan², L. Tidakbi¹, and J. Rupp Noller¹.
¹Department of Plant Pathology,
Throckmorton Plant Science Center, Kansas
State University, Manhattan KS, 66506.
²USDA-ARS Hard Winter Wheat Genetics
Research Unit (HWWGRU), Manhattan,
KS, 66506.

Reaction of Selected Winter Wheat Cultivars to Fusarium Head Blight (FHB), 2025.

The experiment was conducted at Kansas State University Rocky Ford Research Station, Manhattan, Kansas. The field soil type was Chase silty clay loam (pH = 6.5). A randomized complete block design was used with four replicates of 50 wheat cultivars (entries) including Everest, Karl92, and Overley checks. Experimental plots were ten rows 0.5 m wide and 2.3 m long and were seeded on 16 Oct. Corn kernel inoculum was prepared using a native aggressive *Fusarium graminearum* isolate GZ-3639 and air-dried. Sterile corn kernels were used for inoculum production. Field application of the inoculum was done in early spring 15 Apr, 1 May, and 15 May at a rate of 53 g/m². Moisture conditions on the nursery necessary for *F. graminearum* perithecia, spore development, and infection were maintained with mist irrigation throughout the nursery for about 15 min at 4-h intervals during flowering. Heading dates for entries were taken at 50% headed tillers. The incidence of symptomatic wheat plants from natural infection of Fusarium head blight (FHB) was visually estimated for each plot during the flowering period. Sterile corn kernels were used for inoculum production. The FHB incidence (%) were rated every other day namely 27 May, 29 May, 31 May, 2 Jun, 4 Jun, 6 Jun and 9 Jun by rating the percentage of infected spikelets with symptomatic head blight. The area under the disease progressive stairs (AUDPS) (quantitative intensity of FHB) was calculated for all entries and the least significant differences (LSD) ($\alpha=0.05$) were determined using 'Agricolae' R package tool version 1.3-3 (R-Development Core Team). Plots for various entries were harvested on 4 Jul, and the Fusarium damaged kernel (FDK) were estimated (in percentage) through visual inspection after cleaning.

Pathogen infectivity across the nursery was due to optimal conditions necessary for pathogenicity. The early susceptible check Overley had the highest disease severity with an AUDPS (quantitative disease intensity/severity) of 805. Entry NE22249 had the lowest AUDPS of 74.5, outperforming moderately resistant check Everest with AUDPS of 381.5. NE22249 which outperformed all other entries in terms of severity (lower AUDPS) had a slightly greater concentration of the mycotoxin DON at 5.50 ppm. The individual incidence at different dates contributed to the total area under the disease progression curve and FDK.

Fusarium head blight

Entry	Heading	AverageFHB ^Z	FDK ^Y	DON ^X	TotalResistanceAUDPS ^W
NE22174	2025-05-09	7.8	47.5	7.1	108.5
NE22249	2025-05-07	5.3	15.0	5.5	74.5
NE22262	2025-05-06	16.6	58.8	10.1	233.0
NE22287	2025-05-04	15.8	17.5	6.6	221.5
NHH19668	2025-05-05	15.4	42.5	9.8	215.0
NE22200	2025-05-02	18.8	33.8	5.6	263.5
NE22238	2025-05-07	7.3	30.0	5.3	101.5
NE22212	2025-05-03	18.6	40.0	15.3	260.5
NE17441	2025-05-03	16.8	21.3	3.1	235.0
NE19455	2025-04-30	23.3	53.8	9.7	325.5
NE22183	2025-05-02	21.7	43.8	13.7	304.0
NE22252	2025-05-04	19.9	33.8	11.4	278.0
NE22271	2025-05-11	5.7	33.8	8.8	79.5
NE22209	2025-05-03	17.3	42.5	8.1	242.5
NE22172	2025-05-06	16.9	33.8	7.4	236.0
FHBAM6-1-1	2025-04-30	50.8	30.0	5.1	711.5
FHBAM9-4-1	2025-04-30	41.5	38.8	7.3	580.5
FHBAM9-4-2	2025-05-01	41.3	36.3	14.2	578.5
KS160317-4	2025-05-08	6.2	43.8	5.1	87.0
KS190498S-1	2025-05-08	12.0	47.5	16.1	168.0
KS200408S4-1	2025-05-05	22.5	61.3	13.5	315.0
KS200821S4-8	2025-05-02	25.7	43.8	11.9	360.0
KS160401-2	2025-05-05	21.1	61.3	11.2	296.0
KS160524-6	2025-05-03	21.3	41.3	6.4	298.0
KS200102D-2	2025-05-02	19.8	53.8	2.7	276.5
KS200285L-1	2025-05-03	29.7	55.0	13.5	415.5
KS200544S4-3	2025-05-01	27.5	27.5	5.1	385.5
KS200585L-1	2025-05-01	17.9	21.3	4.3	250.0
KS200665S4-8	2025-05-01	33.7	25.0	5.2	472.0
KS200699S4-1	2025-05-04	26.3	28.8	12.7	367.5

CO21SF263RA	2025-05-22	7.9	45.0	9.5	110.5
CO21SF191RA	2025-05-10	10.1	62.5	16.2	142.0
CO22SFD101R	2025-05-11	12.9	55.0	16.2	180.0
CO21SFD0950R	2025-05-06	18.5	42.5	16.5	259.5
CO21SF197R	2025-05-06	13.3	48.8	13.1	186.0
CO21SF226R	2025-05-06	18.2	50.0	30.7	255.0
CO21SF240R	2025-05-07	9.2	52.5	10.2	129.0
CO21SF0073W	2025-05-11	12.1	46.3	11.5	170.0
CO21SF496R	2025-05-08	24.4	53.8	21.9	341.5
CO22SFD105M	2025-05-08	16.4	46.3	33.5	229.5
CO22SFD168W	2025-05-08	13.3	53.8	26.7	186.0
CO22SFD177W	2025-05-04	20.8	32.5	15.0	291.0
CO22SF008WC	2025-05-09	15.0	78.8	14.9	210.5
CO22SF019R	2025-05-05	25.4	47.5	19.8	356.0
CO22SF003R	2025-05-09	14.9	47.5	15.7	208.0
Everest	2025-04-29	27.3	16.3	1.4	381.5
Karl92	2025-04-29	32.8	21.3	4.6	459.0
Overley	1935-04-30	57.5	53.8	12.5	805.0
TAM 105	2025-05-07	24.4	53.8	15.2	341.5
KanMark	2025-05-02	39.0	57.5	14.1	546.0
Average		20.75	42.55	11.61	201.50
p-value		<0.001	<0.001	<0.001	<0.001
LSD		9.73	19.85	8.34	115.64

^z Percentage of wheat plants showing Fusarium head blight symptoms

^yFusarium damaged kernel

^xDeoxynivalenol (DON)

^wArea Under Disease Progress Steps (AUDPS)