Wheat (*Triticum aestivum*)
Fusarium Head Blight; *Fusarium graminearum*

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Reaction of Selected Winter Wheat Cultivars in Kansas to Fusarium Head Blight (FHB), 2023.

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 35 wheat cultivars (entries) including Everest, Karl92, and Overley checks. Experimental plots were seven rows 0.51 m wide and 2.286 m long and were seeded on October 7th. 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 made in early spring on April 15th, May 1st, and May 15th at a rate of 53g/m^2. Moisture conditions on the nursery necessary for *Fusarium graminearum* perithecia, spore development, and infection were maintained with mist irrigation throughout the nursery for about 15 minutes at 4-hour 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. The FHB incidence (%) was rated every other day namely May 28th, May 30th, June 3rd, June 5th, June 7th, and June 9th 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) (p=0.05) were determined using 'Agricolae' R package tool version 1.3-3 (R-Development Core Team). Plots for various entries were harvested on July 4th, 2023, and the Fusarium damaged kernel (FDK) was estimated (in percentage) through visual inspection after cleaning. Kernels of all entries were evaluated for mycotoxin deoxynivalenol (DON) concentration (PPM).

Pathogen infectivity across the nursery was due to optimal conditions necessary for pathogenicity. The early susceptible check Overly had the highest disease severity with an AUDPS of 697.3. Entry KS20HDW185 had the lowest AUDPS (disease severity) of 263, which outperformed the moderately resistant check Everest (with AUDPS of 379.1) however KS20HDW185 had a higher DON concentration of 27.13 PPM compared to the lowest 5.5 PPM DON concentration of moderately susceptible check Karl92. The moderately resistant line Everest placed 3rd with a DON concentration of 5.9 PPM. Karl92 and KS160786S-4 outperformed Everest with lower DON concentrations. Average FDK estimations range between 7 % to 85 % and correlate with evaluated AUDPS and DON concentrations at 0.26 and 0.7 respectively.

		Fusarium head blight				
Entry	Heading	Average FHB (%)	FDK	DON	AUDPC	AUDPS

KS130060C-2	132.5	40.54	41.25	23.78	436.5	538.2
KS130459C-4	128.75	36.13	35	11.93	382.5	476.4
KS140068C-6	132.25	30.83	20	17.88	309.75	402.15
KS140535C-7	136.5	23.13	21.25	25.5	227	300.8
KS140064M-6	131	27.92	40	18.43	280.25	360.35
KS160563S-3	132.25	42.00	38.75	11.55	452	554.9
KS170025D-11	132.5	36.79	85	39.3	388.25	485.15
KS170013D-19	130.5	30.21	23.75	15.68	324.75	405.15
KS170025D-1	132.5	35.79	61.25	38.45	351.67	444.47
KS160765S-6	130.5	29.88	23.75	9.8	309.75	394.05
KS160786S-6	130.5	28.54	37.5	19.33	300	378.3
KS170013D-16	133	28.83	31.25	16.08	291.75	382.35
KS160476S-9	130.75	28.04	22.5	22.58	284.75	367.25
KS14FHB0732M-4	131	20.46	41.25	20.25	196	265.6
KS160855S-4	129	31.08	32.5	14.5	326.75	411.65
KS160352S-1	129.5	36.63	37	17.68	386.75	481.25
KS160786S-4	126.75	34.63	8.75	5.78	368.5	460.6
KS19H10	134	41.92	65	30.35	470.25	563.55
KS20H89	134	33.58	76.25	93.23	363.5	434.6
KS20HW103	133	36.83	66.25	53.78	390.5	485
KS20H105	132	35.46	63.75	27.58	362.75	462.05
KS20H106	133.5	29.50	47.5	26.85	300	386.1
KS20H124	130.25	33.13	46.25	28.8	344.25	436.95
KS20HD134	131.5	35.35	37.5	21.78	353.67	449.27
KS20HDW185	135.25	20.38	35	27.13	203	263
KS21H30	131.5	33.71	53.75	25.55	352	448.6
KS21H31	131.75	29.17	41.25	63.98	298.75	381.25
KS21H36	131.25	38.79	51.25	24.6	420.25	516.55
KS21H38	130	30.83	28.75	16.35	323.5	409.9
KS21HD147	132	30.71	38.75	31.48	318.5	402.8
KS21HD158	137	31.96	58.75	55.95	321.5	419
KS21HD173	132.25	30.38	40	27.23	307.5	393.3
Everest	132	27.96	7	5.9	296	379.1
Karl92	130	26.00	13.75	5.5	266	346.7
Overly	130.75	51.08	23.25	14.85	581.5	697.3
Average	131.76		39.85	25.98	339.72	428.1
pval	-	-		<0.001	<0.001	<0.001
LSD (α=0.05)	1.82	18.66	49.38	47.81	21	18.78

* Percentage of wheat plants showing Fusarium head blight symptoms

** Area Under Disease Progress Steps (AUDPS)

Deoxynivalenol (DON)