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

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Reaction of Selected Winter Wheat Cultivars 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 50 wheat cultivars (entries) including Emerson, Karl92, and Overly checks. Experimental plots were ten 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 done in early spring April 15, May 1 and May 15 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. Sterile corn kernels were used for inoculum production. The FHB incidence (%) were rated every other day namely May 26th, May 28th, May 30th, June 3rd, June 5th, and June 7th 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) 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 Overly had the highest disease severity with an AUDPS (quantitative disease intensity/severity) of 608.90. Entry PMWH186844383 had the lowest AUDPS of 178.35, outperforming seven other lines including the moderately resistant check Everest with AUDPS of 246.90. The moderately susceptible check Karl92 and Everest had the lowest concentrations of DON of 8.55 PPM and 8.68 PPM respectively. PMWH186844383 which outperformed all other entries in terms of severity (lower AUDPS) had a relatively higher concentration of the mycotoxin DON at 26.50 PPM. The individual incidence at different dates contributed to the total area under the disease progression curve and Fusarium damaged kernel (FDK). Average FDK estimations range between 9 % (for entry 9 L01) to 62.50 % (for entry 6 L01) and correlate with evaluated AUDPS and DON at 0.21 and 0.73 respectively.

Fusarium head blight					
Entry	Heading	Average FHB (%) *	FDK	DON	AUDPS**
LCH21-9398	130.50	21.83	60.50	23.23	301.85
LCH21-9436	130.00	25.25	44.75	28.90	353.45
LCH21-9485	131.25	16.79	52.00	26.00	229.00
LCH20-2165	128.25	29.46	20.25	14.60	414.90
LCH20-2026	128.00	21.00	19.75	15.63	293.85
LCH20-2031	130.75	22.33	60.00	24.65	306.75
LCH20-2264	128.75	21.33	32.50	23.85	298.15
LCH20-2054	130.75	21.88	27.00	24.35	311.10
LCH20-2091	130.50	27.29	50.50	28.90	385.10
PMWH186844385	130.75	13.21	32.00	24.40	187.35
PMWH186844383	131.25	12.79	35.50	26.50	178.35
PMWH186844376	130.75	19.67	46.50	30.48	274.35
PMWH186844380	130.25	21.17	19.00	22.50	293.90
PMWH186844381	130.00	21.75	34.75	22.63	301.10
PMWH186844379	130.50	20.58	24.00	21.98	287.80
PMWH186844377	130.25	24.79	35.50	27.25	345.65
PMWH186844378	131.25	22.88	58.25	29.90	315.40
PMWH186844382	130.25	22.71	24.50	21.20	314.15
PMWH186796700	129.75	17.46	31.50	20.25	242.40
1 L01	127.50	24.04	17.75	13.80	331.95
2 L01	131.25	17.38	10.50	16.10	236.60
3 L01	129.00	22.33	30.50	14.80	319.15
4 L01	130.00	25.67	48.00	21.25	362.05
5 L01	130.75	14.25	19.75	15.35	198.00
6 L01	130.50	23.00	62.50	44.88	313.80
7 L01	130.50	18.42	33.00	20.25	254.05
8 L01	129.75	32.50	48.25	21.35	454.40
9 L01	127.75	18.17	9.00	11.30	253.90
10 L01	131.00	18.00	11.25	20.80	249.05
Everest	128.50	17.79	9.75	8.68	246.90
Karl92	127.50	19.08	23.75	8.55	266.15
Overly	128.00	42.17	35.50	23.08	608.90
AP Prolific	130.25	21.63	25.50	14.70	303.75
LCS Runner	129.50	22.50	47.50	24.65	309.05
KS Territory	130.75	17.17	50.50	22.00	233.50
Average	129.89	21.66	34.05	21.68	302.17
pval	<0.001	<0.001	<0.001	<0.001	<0.001
LSD	0.90	23.54	46.89	28.82	24.04

* Percentage of wheat plants showing Fusarium head blight symptoms
** Area Under Disease Progress Steps (AUDPS)