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), 2022.

The experiment was conducted at Kansas State University Rocky Ford Research Station, Manhattan, Kansas. 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 the checks namely Everest and Overley. Experimental plots were five rows 0.51 m wide and 0.1902 m long and were seeded on October 7th. Corn kernel inoculum were prepared using a native aggressive *Fusarium graminearum* isolate GZ-3639 and air-dried. Field application of the inoculum was done in early spring 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) were 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 19th, May 21st, May 23rd, May 25th, May 27th, May 29th, May 31st, June 3rd, June 6th, June 9th and June 11th by rating the percentage of infected spikelet with symptomatic head blight. 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 …..2022 and Fusarium damaged kernel (FDK) were estimated (in percentage) through visual inspection after cleaning. Kernels of all entries were evaluated for mycotoxin deoxynivalenol (DON) concentration (PPM).

There was pathogen infectivity across the nursery due to optimal conditions necessary for pathogenicity. The early susceptible check Overley had the highest disease severity with an AUDPS of 937.75. Entry AM505 had the lowest AUDPS (disease severity) of 254, which outperformed the moderately resistant check Everest (with AUDPS of 439.5). AM503 had the lowest DON centration of 1 PPM and the moderately resistant line Everest placing 6th with a DON concentration of 2.75 PPM. Five lines namely AM503, KS140924K-2, AM505, P25R76, and KS18HD447 outperformed Everest with lower DON concentrations. Average FDK estimations ranges between 6.25 % to 53.75 % and correlated with evaluated AUDPS and DON concentrations.

		Fusarium Head Blight Incidence (%) *													
Entry	Heading	19 May	21 May	23 May	25 May	27 May	29 May	31 May	3 Jun	6 Jun	9 Jun	11 Jun	FDK	DON	AUDPS **
KS140924K-2	132	0	0.25	0.5	1.25	1	2	6.75	8.75	11.25	27.5	56.25	15	1.75	257.75
KS140064M-7	129.75	0.5	0.25	0.75	1.5	1	1.25	12.5	17.5	16.25	45	65	16.25	4.75	369.25
KS140953M-2	131	0.25	0	0.25	1.5	1.25	2.5	7.5	15	21.25	41.25	75	16.25	8.5	375.25
KS140064M-6	128.5	0.25	0	0.5	1.25	1	1	5.5	15	21.25	37.5	65	16.25	5	338.25

KS130544M-2	129	1.25	1.5	1.25	1.75	2	6.5	16.25	35	47.5	75	83.75	26.25	4.5	642.25
KS130291K-4	127.25	0.75	1	2.5	1.75	1.5	6.75	17.5	35	45	68.75	81.25	31.25	3.75	621
KS130500K-4	127.25	0.5	0.25	2	1.75	1.5	7.5	15	23.75	23.75	63.75	80	28.75	2.75	502
KS130059M-4	128.5	0.5	0.5	1.75	1.5	1.5	27.75	25	37.5	32.5	82.5	82.5	51.25	4.75	682
KS140732M-1	128.25	0.25	0.5	0.75	1.5	0.75	3.5	13.75	20	22.5	58.75	73.75	16.25	4.25	448.25
KS140913K-2	128.25	0.75	0.5	2	1.25	1.25	4.25	17.5	27.5	27.5	43.75	65	37.5	4.5	455
KS13FHB0321	128	0.75	0.75	0.75	1.5	1.25	3.5	10	21.25	23.75	52.5	72.5	18.75	3	432
KS140732M-4	127.25	0.5	0.5	1.5	1.5	1.5	6.25	12.5	16.25	23.75	67.5	68.75	15	3.25	453.5
KS130223K-2	126.5	0.75	0.75	1.25	1.5	1	11.75	13.75	20	26.25	53.75	75	16.25	3.5	471.5
KS130039M-3	128.75	0.25	0.75	1.25	1.25	2.25	5.75	13.75	20	25	43.75	55	16.25	5	396.75
KS140794M-6	129.5	0.75	2	1.25	1.75	1	7.75	12.5	20	27.5	48.75	78.75	20	4.5	464
KS18H111-3	128.25	0.25	0.25	1	1.5	1.25	3	11.25	18.75	16.25	45	73.75	16.25	5	390.75
KS19H10	128.25	0.5	1	2.25	1.75	2	6	20.5	37.5	38.75	55	71.25	13.75	4.75	569.75
KS19H21	128.75	0.75	1	1.75	2	3.25	8	23.75	38.75	40	81.25	91.25	28.75	4.25	686
KS19HD69	129	0.25	1.5	1.5	1.5	2.25	18.75	25	41.25	41.25	76.25	78.75	27.5	3.5	684
KS19HW84	129.25	0	0	0.75	1.25	1	2.25	7.5	16.25	15	41.25	61.25	17.5	6.75	331.75
KS20H89	128.25	0.25	0.25	1	1.25	1.25	14	25	41.25	41.25	67.5	82.5	18.75	10.5	658.5
KS20H106	127.75	0.5	2.25	1.75	1.5	2.5	19	31.25	52.5	66.25	81.25	82.5	32.5	5	832.5
KS20H124	127.75	0.5	0.5	0.75	1.5	1.25	6.25	13.75	20	35	58.75	71.25	16.25	7.25	487.75
KS20HD134	129.5	0.75	0.75	2	1.75	2	3.25	27.5	43.75	56.25	75	77.5	53.75	7.25	708.5
KS20HD144	127.75	1	2.75	3.25	2.75	2.25	12.75	30	53.75	61.25	78.75	72.5	50	8.75	787
KS20HD170	127.5	0.75	1	1.75	1.5	1.75	17.5	23.75	40	40	71.25	78.75	46.25	5.75	659.75
KS20HD178	128.67	0.33	0.33	1	1.67	1.67	1.33	13.33	26.67	30	53.33	73.33	20	6	476
KS18HD447	127.5	1	2.5	3.75	2.25	4.5	9	22.5	48.75	62.5	80	82.5	11.25	2.25	772.25
KS18HD499	130.75	0.25	0.25	0.5	1.75	1.25	6	12.5	25	101.25	61.25	73.75	17.5	4.5	706.25
KS20HDW185	129.5	0.75	0.25	0.5	1.25	0.75	1.5	8.75	11.25	10	42.5	75	10	5.75	335
Everest	127.5	0.5	1	1.5	1.75	1.25	2.5	8.75	13.75	22.5	66.25	77.5	6.25	2.75	439.5
Overley	126.75	0.75	2.75	5.75	3.25	5	5.75	36.25	63.75	76.25	88.75	92.5	45	11	937.75
AM503	128.75	0.75	0	0.25	1	0.75	1.25	9.25	19.5	7.5	51.25	67.5	7.5	1	354.25
AM505	129.25	0.25	0.75	0.75	1.75	1	14.25	10.5	8.75	6.25	18.75	51.25	10	2	254
P25R76	127.25	0.25	0.75	0.5	1.25	1	2.25	12.5	15	20	47.5	70	11.25	2.25	389.5
Average	128.5	0.52	0.84	1.44	1.62	1.65	7.22	16.38	27.67	33.78	58.59	73.77	22.89	4.86	524.84
P-value															<0.001
LSD	1.29	99.06	124.19	81.26	40.76	59.75	117.93	42.83	33.83	81.31	27.019	19.98	52.60	42.65	23.13

* Percentage of wheat plants showing fusarium head blight symptoms

** Area Under Disease Progress Steps

Fusarium Damaged Kernel (FDK), Deoxynivalenol (DON)