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

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Reaction of Kansas Interstate Nursery winter wheat accessions to Fusarium head blight, 2020.

An experiment was established at the Kansas State University, Rocky Ford Research Station in Manhattan, KS. Soil was a Chase silty clay loam (pH = 6.5). The experiment was planted in a randomized complete block design with four replications of 30 entries. Single row plots were seeded at a rate of 67.25 kg/ha into 2.3-m long with 0.51-m row spacing on 01 Oct 2019. Corn kernel inoculum was grown with two aggressive *Fusarium graminearum* isolates (GZ-3639, Pt-1-04) and air-dried. Inoculum was spread onto the plots at a rate of 53 g/m^2 on 12 Apr, 27 Apr, and 12 May 2020. During anthesis, the nursery was mist irrigated to improve *F. graminearum* conditions for 5 minutes every 4 hours throughout the night for a total of 20 minutes per night. Heading dates were recorded when plots reached 50% headed tillers. FHB index was rated on 21 May, 24 May, 27 May, 29 May, 31 May, 02 Jun, and 04 Jun 2020 by determining the percent of symptomatic spikelets. Plots were harvested on 24 Jun 2020. The ration of Fusarium damaged kernels (FDK) was recorded after cleaning. Grain samples were evaluated for deoxynivalenol (DON) concentration. Area under the disease progress stairs (AUDPS) and the least significant difference (LSD) (α=0.05) were calculated using the R package 'Agricolae' version 1.3-3 (Mendiburu, 2020). Data were analyzed with the 'aov' function (R Core Team, 2019).

Pathogen pressure was high due to optimal conditions and supplemental irrigation during anthesis. This allowed sufficient differences in disease severity rating to determine differences between tested lines. The early susceptible check 'Overley' had the highest AUDPS of 751.8. However, two additional lines (KS120648M~5 and KS13DH0030-28) had disease severity ratings that were not better than the susceptible check. 'Everest', the moderately resistant check had an AUDPS of 198.8. There were 11 lines which performed as well as 'Everest' but no lines had an AUDPS significantly lower than 'Everest'. FDK mean percentages ranged from 1.5% to 35%, with results being highly correlated with AUDPS. DON levels in the grain ranged from 13.33 to 89.73 ppm, with a mean of 47.5 ppm. These ratings were correlated with disease severity ratings.

Variety	Heading Date[z]	Plot Damage Severity (%)							AUDPS[y]	Mean FDK	Mean DON
		21-May	24-May	27-May	29-May	31-May	02-Jun	04-Jun			
AgRobust	119.5	0.3	1.4	5.7	7.9	37.8	43.5	51.4	297.4	0.035	23.18
Everest	119.5	0.0	0.5	1.8	3.1	13.1	16.8	63.8	198.8	0.03	13.33
Karl92	121	0.0	0.9	2.2	8.7	19.8	32.5	73.2	275.6	0.015	27.18
KS090049K-8	120	0.0	1.3	13.5	15.3	46.7	67.1	77.0	443.0	0.238	46.83
KS090616K-1	126.5	0.0	0.2	3.5	5.8	19.2	35.1	58.8	245.4	0.015	42.18
KS100028K-10	121.75	0.0	1.5	7.0	22.7	31.9	47.9	76.9	377.4	0.115	56.15
KS100028K-11	124	0.5	6.9	39.6	44.3	59.3	69.4	89.5	626.3	0.338	73.10
KS120081M~1	122	0.0	2.9	8.3	11.5	26.3	37.0	70.0	314.9	0.058	37.43
KS120081M~5	121.25	0.3	1.5	14.7	22.3	42.0	50.2	59.4	382.4	0.1	27.98
KS120529M~7	122.25	0.0	1.7	11.1	17.6	28.8	54.5	82.5	394.0	0.063	49.50
KS120648M~5	122.25	0.5	10.8	50.0	57.5	65.5	82.7	90.6	726.3	0.058	34.20
KS12DH0090-172	121	0.0	2.0	32.3	45.3	65.2	70.1	75.3	582.4	0.138	65.23
KS12DH0156-88	125.25	0.3	0.9	6.5	9.1	47.5	68.9	77.8	423.1	0.125	48.78
KS13DH0008-23	122.25	0.3	2.9	14.1	36.3	50.3	58.2	83.1	493.6	0.15	69.93
KS13DH0030-28	124.5	0.0	1.7	16.2	47.0	85.7	88.0	99.0	677.1	0.35	89.73
KS13DH0041-35	122.25	0.3	0.9	6.7	14.7	31.9	57.7	71.3	367.8	0.115	51.73
KS15H137-2	123.5	0.3	1.1	2.8	5.5	19.1	29.5	67.8	253.3	0.063	35.03
KS18H110-3	125	0.3	0.8	5.1	35.2	47.3	71.3	96.0	513.0	0.263	85.73
KS18H111-3	124.75	0.0	1.0	3.8	4.1	14.3	16.5	47.1	174.8	0.058	31.03
KS18H124-6	127.25	0.0	3.7	19.7	10.2	94.8	45.0	70.9	492.4	0.093	47.55
KS18H127-4	123.5	0.0	0.7	3.3	17.4	28.6	44.0	63.3	315.2	0.17	87.08
KS18H142-1	127.5	0.0	0.1	2.4	6.2	32.3	45.6	80.5	334.3	0.15	67.43
KS18H19-1	123.75	0.3	0.8	5.1	17.2	20.5	45.8	66.4	313.3	0.09	57.63
KS18H99-6	122.5	0.0	0.5	2.7	5.6	17.9	20.2	51.4	197.1	0.033	26.63
KS18HW133-6	122.75	0.0	1.3	5.2	5.7	18.8	31.5	55.0	236.5	0.04	64.83
KS18HW42-1	125.25	0.0	0.8	5.9	4.2	12.6	29.3	36.1	178.6	0.015	26.10
NUSAKA15-3	122	0.3	1.2	9.1	9.7	24.7	37.1	59.3	284.4	0.073	28.78
Overley	119.5	0.3	27.3	50.4	26.8	60.4	99.5	97.5	751.8	0.065	54.18
WB4269	122.25	0.3	1.0	18.7	13.0	33.8	41.4	72.8	362.8	0.03	18.75
Zenda	123.5	0.3	0.4	3.8	5.4	19.7	26.4	54.7	222.0	0.05	37.85
p-value	<0.0001	0.7525	0.0262	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
cv	1.1	264.25	296.97	92.73	65.14	66.07	23.43	19.63	23.36	63.95	31.17
LSD	1.9	--	10.95	16.14	16.34	34.54	16.05	19.48	125.35	0.09	20.81

[z]Days from January 1

[y]Area Under the Disease Progress Stairs

[x]Data were analyzed with R Core Team (2019). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL https://www.R-project.org/. Least significant difference (LSD) at P = 0.05 were calculated using the Agricolae package.