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

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Reaction of Kansas, Nebraska, and South Dakota winter wheat accessions to Fusarium head blight (FHB), 2007.

A field experiment was conducted in Chase silty clay loam (pH=6.5) near Manhattan, KS. Experimental design was a randomized complete block comprising the Hard Winter Wheat Fusarium Head Blight Nursery with 48 entries from the Kansas, Nebraska, and South Dakota breeding programs. There were four replications and plots were single rows 7.5 ft long spaced 20 in. apart. Seed was sown 2 Oct 06 (1 bu/A). Air-dried corn kernels colonized by a single, aggressive isolate of *Fusarium graminearum* were spread throughout the test area on 1 Apr, 15 Apr, and 1 May (0.28 oz/ft^2 total). During anthesis, heads were kept wet using overhead, impulse sprinklers applying water 3 min of every hour from 9:00 p.m. until 6:00 a.m. For each plot, heading date (50% headed) was determined and visual estimations of the percent symptomatic spikelets (FHB index) for each plot were taken on 28 May, 31 May, 4 Jun, 7 Jun, and 14 Jun. Plots were harvested with a combine on 3 Jul and grain sub-samples were rated for percent Fusarium damaged kernels (FDK). Ground grain samples were also sent to the North Dakota Veterinary Diagnostic Lab for determination of deoxynivalenol (DON) levels. Data for each rating date, the mean of all rating dates, heading date, yields, FDK, and DON levels in grain were subjected to analysis of variance followed by Fisher's least significant differences (LSD, P=0.05). Correlations among parameters were also calculated.

Severe FHB developed as evidenced by disease ratings from the susceptible check Overley. All entries, except NE05403, KS000183-3-1, KS000183-3-2, KS010514-6-11, KS980512-11-24, KS990152-3-26, KS04WKS-24, and KS010525-1-1 had significantly lower mean FHB ratings compared with Overley. The line SD07359 had the lowest mean rating, although three other entries were statistically similar including the resistant check cultivar Hondo. The cultivar Karl 92 had the lowest DON levels although nine other entries were statistically similar. There was a significant negative correlation between heading and mean FHB index (n = 192, r = -0.5702, P < 0.0001) indicating late maturing entries tended to have less FHB. However, there was a positive correlation between heading and DON levels (n = 192, r = 0.4308, P < 0.0001). There was a significant negative correlation between mean FHB index and yield (n = 192, r = -0.2281, P = 0.0015), a significant positive correlation between FHB index and FDK (n = 192, r = 0.5066, P < 0.0001), and a positive correlation between FDK and DON (n = 192, r = 0.1708, P = 0.0179). Interestingly, there was a significant negative correlation between mean FHB index and DON levels (n = 192, r = -0.2129, P = 0.0030).

	FHB (% infected spikelets)						Heading	Yield	FDK	DON
Entry[z]	28 May	31 May	4 Jun	7 Jun	14 Jun	Mean[y]	(Julian)	(oz/plot)	(%)[x]	(ppm)[w]
SD07359	1.0	6.0	13.0	27.5	52.5	20.0	139.5	1.08	28.8	30.8
SD00111-9	1.0	7.8	14.8	25.0	61.3	22.0	137.5	3.75	25.0	19.0
Hondo	1.5	9.3	18.5	31.3	57.5	23.6	136.5	1.90	31.3	24.5
SD05133	2.0	8.0	22.5	33.8	52.5	23.8	139.0	1.84	33.8	30.4
SD05048	1.5	8.0	21.3	35.0	62.5	25.7	138.3	2.28	26.3	18.4
Harding	2.0	12.3	23.8	35.0	65.0	27.6	139.3	1.26	43.8	33.9
Darrell	3.0	8.8	22.5	37.5	68.8	28.1	137.5	1.52	42.5	19.0
Goodstreak	1.5	11.0	27.5	47.5	62.5	30.0	136.5	2.22	50.0	24.6
SD02480	1.5	11.0	27.5	47.5	62.5	30.0	139.5	1.17	40.0	32.4
KS980512-2-2	2.0	7.8	21.3	43.8	76.3	30.2	135.8	4.14	20.0	21.0
SD05267	2.5	10.5	31.3	38.8	70.0	30.6	134.0	2.22	43.8	26.9
NE05537	4.8	14.8	25.0	40.0	72.5	31.4	135.5	1.83	31.3	17.3
SD05250	2.5	14.3	27.5	37.5	76.3	31.6	136.0	1.62	46.3	29.0
NW03666	2.5	14.8	30.0	56.3	55.0	31.7	136.3	1.13	52.5	31.3
SD07288	4.0	12.5	27.5	38.8	77.5	32.1	136.3	1.43	21.3	15.5
NW03654	4.8	13.0	25.0	50.0	72.5	33.1	133.8	1.74	50.0	27.1
KS04WKS-13	4.0	16.3	35.0	47.5	72.5	35.1	135.3	0.73	48.8	38.8
Expedition	7.0	15.0	26.3	55.0	72.5	35.2	133.5	1.67	21.3	23.1
NE05418	5.5	16.0	25.0	48.8	82.5	35.6	131.3	3.19	22.5	14.2
NI04427	6.5	16.0	27.5	47.5	82.5	36.0	133.5	3.19	35.0	17.9
SD05156	2.0	12.3	30.0	63.8	75.0	36.6	139.3	0.83	55.0	25.5

	FHB (% infected spikelets)						Heading	Yield	FDK	DON
Entry[z]	28 May	31 May	4 Jun	7 Jun	14 Jun	Mean[y]	(Julian)	(oz/plot)	(%)[x]	(ppm)[w]
NE03488	5.8	17.5	31.3	53.8	76.3	36.9	135.5	2.06	28.8	18.0
KS06PYN2-21	9.8	22.5	33.8	42.5	81.3	38.0	133.0	1.60	28.8	17.3
SD05W012	4.5	14.0	32.5	53.8	85.0	38.0	135.5	2.14	42.5	19.7
KS990002-2-4	7.0	18.8	35.0	50.0	80.0	38.2	134.3	2.09	28.8	13.8
NE06497	3.5	18.8	32.5	60.0	80.0	39.0	135.0	1.42	55.0	17.5
NE05523	3.5	15.0	38.8	57.5	88.8	40.7	135.5	1.59	63.8	23.2
NE05496	5.5	16.0	36.3	61.3	85.0	40.8	134.8	1.19	60.0	25.9
Karl 92	9.3	23.8	36.3	61.3	77.5	41.6	131.5	1.71	45.0	10.3
NE05453	5.5	22.5	33.8	72.5	77.5	42.4	134.5	2.26	56.3	23.7
NI04411	3.5	15.0	36.3	72.5	85.0	42.5	136.0	2.45	40.0	13.2
SD01058	4.5	21.3	38.8	67.5	81.3	42.7	137.0	0.86	52.5	23.4
NE04449	10.3	24.3	38.8	58.8	82.5	42.9	134.0	1.88	33.8	15.2
KS990002-2-13	13.0	28.0	40.0	51.3	86.3	43.7	133.8	1.62	51.3	15.2
KS010525-1-3	4.5	18.8	46.3	65.0	83.8	43.7	135.3	2.20	42.5	24.1
SD07338	3.5	21.3	45.0	75.0	76.3	44.2	139.0	0.48	52.5	38.7
KS980512-11-22	10.3	21.3	42.5	66.3	88.8	45.8	133.8	1.43	50.0	18.5
KS010520-5-3	7.0	23.8	40.0	77.5	82.5	46.2	132.8	1.32	58.8	29.1
NE04490	14.8	28.8	41.3	65.0	81.3	46.2	132.3	1.60	65.0	17.1
NE05403	16.8	28.3	42.5	68.8	86.3	48.5	133.0	1.55	35.0	15.4
KS000183-3-1	8.0	21.8	46.3	72.5	96.3	49.0	134.3	2.50	81.3	22.9
KS000183-3-2	5.5	20.0	51.3	78.8	91.3	49.4	134.8	1.74	60.0	32.2
KS010514-6-11	10.5	28.8	52.5	77.5	91.3	52.1	133.3	0.78	48.8	17.9
KS980512-11-24	15.5	31.3	48.8	76.3	92.5	52.9	132.8	1.34	67.5	22.9
Overley	16.8	28.8	55.0	76.3	88.8	53.1	134.8	0.54	66.3	24.6
KS990152-3-26	18.0	37.5	50.0	70.0	93.8	53.9	130.3	2.52	63.8	12.0
KS04WKS-24	20.0	40.0	58.8	83.8	92.5	59.0	131.5	1.69	60.0	20.2
KS010525-1-1	13.0	37.5	67.5	86.3	92.5	59.4	133.8	1.89	52.5	21.8
Average	6.5	18.5	34.9	56.0	77.8	38.7	135.1	1.77	45.0	22.4
LSD (P=0.05)	5.8	8.7	7.7	12.6	9.8	5.6	1.5	0.80	18.7	6.9
R^2	0.7	0.7	0.9	0.8	0.8	0.9	0.9	0.70	0.6	0.7
CV	63.3	33.5	15.7	16.0	9.0	10.3	0.8	32.10	29.7	22.0

[z]Sorted by data in "Mean" column.
[y]Average for rating dates 28 May, 31 May, 4 Jun, 7 Jun, and 14 Jun.
[x]Fusarium damaged kernels.
[w]Deoxynivalenol.

This material is based upon work supported by the U.S. Department of Agriculture, under Agreement No. (58-5430-2-323). This is a cooperative project with the U.S. Wheat & Barley Scab Initiative. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.