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), 2014.

A field experiment was conducted in a Chase silty clay loam (pH = 6.5) near Manhattan, KS. The experimental design was a randomized complete block comprising the Hard (red and white) 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 on 30 Sep 2013 (1 bu/A). Air-dried corn kernels colonized by two aggressive isolates of *Fusarium graminearum* were spread throughout the test area on 1 Apr, 15 Apr, and 1 May (0.25 oz/ft^2 total). During anthesis, heads were kept wet using overhead, impulse sprinklers applying water 3 min. per hour from 9:00 pm until 6:00 am. For each plot, heading date (50% headed) was determined and visual estimations of percent symptomatic spikelets (FHB index) for the entire plot were taken on 29 May, 31 May, 3 Jun, and 5 Jun. Plots were harvested with a combine on 2 Jul and grain sub-samples were rated for percentage *Fusarium*-damaged kernels (FDK). Ground grain samples from all plots were sent to the North Dakota State University Toxicology Lab for determination of deoxynivalenol (DON) concentrations. Data for heading date, each rating date, mean of all four rating dates, FDK, and DON concentrations in grain were subjected to analysis of variance followed by Fisher's protected least significant differences (LSD, $P = 0.05$). Correlations among parameters were also calculated.

Severe FHB developed and the susceptible check Overley had the greatest mean FHB index (48.5%). All entries had significantly lower mean index values than Overley. The moderately-resistant check Everest was in the group with the lowest mean index rating, although 30 other entries were statistically similar. Everest also had a fairly low DON level (14.5 ppm) although one entry (KS12FHB(A+)-39) was statistically lower and 24 other entries were statistically similar. The susceptible check Overley had high DON levels (27.7 ppm) although two entries (SD09113 and KS12FHB(A+)-69) were statistically higher, and 24 other entries were statistically similar to Overley. There was no significant correlation between heading and mean FHB index ($n = 192$, $r = 0.0357$, P=0.6232); however, there were significant correlations between heading and FDK, and heading and DON ($n = 192$, $r = 0.5033$, $P < 0.0001$ and $n = 192$, $r = 0.4668$, $P < 0.0001$, respectively). Similarly, there was a significant correlation between mean FHB index and FDK ($n = 192$, $r = 0.4329$, $P < 0.0001$), mean FHB index and DON levels ($n = 192$, $r = 0.4003$, $P < 0.0001$), and FDK and DON (n = 192, $r = 0.4266$, $P < 0.0001$), indicating positive associations among these parameters.

	Heading	FHB index (%)					FDK[x]	DON[w]
Entry[z]	(Julian)	29 May	31 May	3 Jun	5 Jun	Mean[y]	(%)	(ppm)
KS12FHB(A+)-54	130.3	1.3	7.3	17.5	10.0	9.0	9.5	12.9
KS12FHB(A+)-38	130.0	2.5	4.3	15.0	18.0	9.9	7.0	10.4
KS12FHB(A+)-44	132.0	4.5	5.8	11.0	21.3	10.6	24.0	14.5
KS12FHB(A+)-75	129.5	3.8	13.8	18.8	12.8	12.3	26.5	17.2
KS12FHB(A+)-39	123.8	3.5	4.8	15.8	26.3	12.6	9.3	7.2
KS061837M-3	130.5	3.0	5.5	15.8	26.8	12.8	25.0	15.2
Everest	122.5	7.3	6.5	15.8	22.0	12.9	16.3	15.1
KS12FHB(A+)-81	122.0	2.8	7.8	19.8	21.5	12.9	8.3	15.5
Mattern	133.3	3.3	5.3	12.8	31.0	13.1	45.0	25.4
NE08499	130.5	4.5	6.5	16.5	26.0	13.4	32.5	15.5
NE12518	131.8	4.0	9.5	15.8	24.8	13.5	57.5	21.1
SD08080	133.3	3.8	6.3	16.3	28.3	13.6	50.0	27.1
SD09140	136.3	3.5	8.0	16.5	28.5	14.1	62.5	29.4
KS061131K-13	125.0	5.5	7.5	18.3	26.0	14.3	21.3	20.2
KS12FHB(A+)-108	123.0	3.8	8.5	21.0	26.0	14.8	11.5	22.3
SD10026-2	135.0	4.5	9.8	20.8	28.5	15.9	52.5	28.4
NE06545	129.5	4.3	11.0	19.8	29.0	16.0	50.0	25.4
KS061162M-4	127.3	4.0	5.8	20.0	34.8	16.1	26.3	16.0

Entry[z]	Heading (Julian)	FHB index (%)					FDK[x] (%)	DON[w] (ppm)
		29 May	31 May	3 Jun	5 Jun	Mean[y]		
KS061131M-1	125.3	6.8	10.8	17.8	31.0	16.6	27.5	14.5
SD09227	134.5	4.3	8.3	19.5	34.3	16.6	61.3	18.9
NI13703	126.3	5.5	9.5	19.8	32.0	16.7	45.0	17.0
SD08200	132.3	3.5	9.0	21.3	33.3	16.8	50.0	27.2
NE06607	132.3	5.0	8.5	24.8	29.0	16.8	46.3	23.1
SD09192	137.0	4.3	11.3	21.0	30.8	16.8	73.8	26.9
NI10720W	132.3	5.0	13.0	19.0	31.3	17.1	20.0	29.3
NI12702W	135.3	4.8	9.5	21.8	33.0	17.3	27.5	30.2
SD09138	137.0	4.0	12.8	20.0	32.5	17.3	71.3	30.4
SD10257-2	134.3	3.8	14.0	21.8	29.8	17.3	36.3	20.5
KS061658K-5	124.8	7.3	11.0	23.5	31.5	18.3	31.3	18.9
NE12483V	129.3	6.3	11.8	23.5	33.0	18.6	11.5	19.9
NE12637	133.5	8.8	15.5	22.0	29.5	18.9	70.0	26.2
NH11489	130.5	7.0	14.8	21.3	35.5	19.6	36.3	25.0
NE12438	128.5	5.5	16.3	23.5	33.8	19.8	63.8	13.9
KSOCW06S1440T-M-9	129.5	10.5	12.5	25.0	31.3	19.8	35.0	20.8
Karl 92	126.0	7.3	11.5	25.5	36.0	20.1	27.5	18.3
SD09113	138.8	2.3	14.0	25.3	38.8	20.1	61.3	35.6
KS061162M-2	127.8	3.8	6.8	24.3	46.3	20.3	45.0	18.9
SD10135	136.0	6.3	17.0	25.0	35.5	20.9	70.0	26.8
NE12444	126.8	9.3	15.5	25.5	39.8	22.5	61.3	21.5
SD110060-9	137.3	5.8	15.8	28.0	41.8	22.8	61.3	22.6
SD09118	134.3	5.3	15.3	31.5	40.3	23.1	53.8	29.2
NE10478	127.0	9.8	17.5	28.5	45.5	25.3	53.8	19.5
SD10W153	128.3	10.5	19.5	30.5	41.3	25.4	18.8	34.9
SD110038-3	137.5	7.5	21.0	32.8	41.0	25.6	68.8	28.6
KS12FHB(A+)-69	130.0	10.0	27.0	35.8	36.0	27.2	65.0	37.9
NI13717	125.0	13.0	20.5	34.5	44.5	28.1	48.8	17.0
SD110044-7	134.0	9.3	27.5	41.5	58.8	34.3	82.5	25.3
Overley	124.8	25.3	33.5	62.0	73.3	48.5	57.5	27.7
Average	130.4	6.0	12.2	23.0	32.7	18.5	42.0	22.2
LSD (*P*=0.05)	1.86	3.39	7.64	8.42	7.97	6.31	21.3	7.5

[z]Sorted by data in FHB index "Mean" column. Everest (MR) and Overley (S) were used as the moderately resistant and susceptible checks, respectively.

[y]Mean of 29 May, 31 May, 3 Jun, and 5 Jun rating dates.

[x]*Fusarium*-damaged kernels.

[w]Deoxynivalenol concentration in ground grain samples.

This material is based upon work supported by the U.S. Department of Agriculture, under Agreement No. 59-0206-1-110. 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.