Report of the 2006 Uniform Regional Scab Nursery for Spring Wheat Parents

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The Uniform Regional Scab Nursery for Spring Wheat Parents (URSN) was grown for the 12th year in 2006. Six mist-irrigated locations at Brookings, SD, St. Paul and Crookston, MN, Prosper and Langdon, ND, and Glenlea (Manitoba, Canada) were planted. The St. Paul, Prosper and Langdon locations encountered problems and thus are not included in the 2006 report.

A total of 35 entries were included in the 2006 URSN, including the resistant checks 2375, BacUp, ND2710, and the susceptible checks Wheaton and Oslo. Rugby was added this year as a durum check. The other 29 entries were contributed by university, industry, and national breeding programs. Three entries were durums, and the others were hard red spring wheat.

A core set of traits evaluated provided from most locations included scab incidence, scab severity, disease index (incidence x severity), and visual scabby kernel ratings (VSK, ≅ tombstone). Additional recorded trait data such as grain deoxynivalenol content, plot yield, and heading date, are presented in individual location summary tables. Overall means for traits across locations are presented, as are relative rankings for scab incidence, severity, disease index, and VSK. Correlation coefficients are provided between scab incidence and severity, disease index, and VSK.

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Table 1. Entries for the Uniform Regional Scab Nursery for Spring Wheat Parents, 2006.

Entry No.	Name	Pedigree	Source	Year
1	2375	CHECK	ND	
2	Wheaton	CHECK	MN	
3	Bacup	CHECK	MN	
4	Oslo	CHECK	AGP	
5	ND2710	CHECK	ND	
6	Rugby*	DURUM CHECK	ND	
7	SD3934	NORIN34//SD3247/1319 313-3-1-3/3/FORGE/4/SD3411	SD	2006
8	SD4041	PI 168730/SD3533//ND740	SD	2006
9	SD4042	PI 168730/SD3533//ND740	SD	2006
10	SD4059	PI 584914/SD3730//SD3641	SD	2006
11	SD4066	PI 225448/PARSHALL//SD3603	SD	2006
12	MN00209-3-1	IDO530/SEARS 29	MN	2006
13	MN00261-4	MN95286/MN94155//VERDE	MN	2006
14	MN01311-A-1	97T-1003/Verde	MN	2006
15	MN02222-1	MN98389/MN97518	MN	2006
16	MN02268-A-4	MN99077/MN97518	MN	2006
17	M05/1-14	SUMAI 3/STOA//ND674/3/TOKAI 66	ND	2005
18	M05/1-15	SUMAI 3/STOA//ND674/3/ND744	ND	2005
19	M05/1-16	FRONTANA/W9207//ND716/3/ND716 SELN.	ND	2005
20	M05/1-17	FUJIAN 5114-1/MN2538//ND716 SELN.	ND	2005
21	M05/1-18	FRONTANA/W9207//2*ND2940	ND	2005
22	NDSW0430	ND674//Grandin/ND614/3/ND2831	ND	2006
23	00S0244-23	N96-0001ES/3/SUMAI3/DALEN//HAMER	AGP	2006
24	00S0251-6	KNUDSON/4/N97-0214/3/N93-0338//SUMAI3/DALEN	AGP	2006
25	00S0327-18	LARS/N93-0383/3/CHINA SCAB#23/N94-0241	AGP	2006
26	01S0380-18	N99-0398ES/4/N96-0104/3/N93-0339//SUMAI3/DALEN	AGP	2006
27	BW357	BW 278/2*BW 252	MAN	2006
28	05M SP5	Rubi/Prointa Real	TRI	2006
29	CA905-753	Barrie x Bigg Red	WB	2006
30	CA905-754	Barrie x Alsen	WB	2006
31	CA-905-755	Barrie x Alsen	WB	2006
32	CA-905-750	Alsen x Knudson	WB	2006
33	CA803-737*	Ben/Kofa/898-782	WB	2006
34	DG013141*	Belzer/WB735	DGP	2005
35	DG012166*	Maier/WB733	DGP	2005

* Durum Entries

SD, South Dakota State University; MN, University of Minnesota; ND, North Dakota State University; MAN, Agriculture and Agri-Food Canada, Glenlea, Manitoba; DGP, Dakota Growers Pasta Company; TRI, Trigen; WB, Westbred; AGP, Agripro

Table 2. 2006 Uniform Regional Scab Nursery for Spring Wheat Parents, Brookings, SD.

Line	Incidence %	Severity %	Disease Index	Tombstone %	Yield (g/plot)	Test Weight
2375	93.3	21.5	20.1	43.3	49	20.0
Wheaton	100.0	55.3	55.3	88.3	51	16.7
Bacup	78.3	23.5	21.6	16.0	62	22.0
Oslo	98.3	31.0	30.5	70.0	28	17.3
ND2710	96.7	12.5	12.2	4.3	97	22.0
Rugby	100.0	59.7	59.7	63.3	25	17.3
SD3934	80.0	9.5	7.7	4.3	70	21.3
SD4041	98.3	14.8	14.6	9.0	89	20.0
SD4042	91.7	17.3	16.1	4.7	46	21.3
SD4059	91.7	19.0	17.6	8.3	69	19.3
SD4066	100.0	32.8	32.8	11.7	39	19.3
MN00209-3-1	78.3	9.0	7.3	7.7	85	20.7
MN00261-4	100.0	39.8	39.8	7.3	66	20.7
MN01311-A-1	98.3	19.5	19.2	6.7	83	22.0
MN02222-1	95.0	14.3	13.5	6.0	70	21.3
MN02268-A-4	98.3	21.3	21.1	15.0	34	18.7
M05/1-14	78.3	17.5	14.2	3.7	53	21.3
M05/1-15	80.0	10.7	8.9	1.7	63	21.3
M05/1-16	88.3	19.8	17.8	13.3	48	19.3
M05/1-17	78.3	17.0	14.2	10.0	71	20.7
M05/1-18	88.3	18.2	16.0	11.0	42	18.7
NDSW0430	91.7	16.5	15.6	9.3	54	20.0
00S0244-23	86.7	18.7	17.4	20.0	42	19.3
00S0251-6	83.3	12.7	10.9	3.7	85	21.3
00S0327-18	100.0	16.3	16.3	13.3	79	19.3
01S0380-18	98.3	23.8	23.5	31.7	61	19.3
BW357	96.7	20.7	20.1	15.0	49	20.0
05M SP5	95.0	33.0	32.2	11.7	59	20.0
CA905-753	100.0	36.5	36.5	36.7	41	18.7
CA905-754	96.7	25.5	24.9	3.7	56	21.3
CA-905-755	100.0	26.8	26.8	10.0	21	19.3
CA-905-750	95.0	17.8	17.0	5.7	64	21.3
CA803-737	100.0	56.5	56.5	36.7	11	18.0
DG013141	100.0	57.0	57.0	53.3	21	16.0
DG012166	100.0	56.2	56.2	68.3	17	20.1
Mean	93.0	25.8	24.9	20.7	54.7	19.9
LSD	15.4	11.2	12.2	21.4	23.8	1.6
CV	10.1	26.7	30.1	63.5	26.5	4.0

Table 3. 2006 Uniform Regional Scab Nursery for Spring Wheat Parents, Crookston, MN.

Line	Incidence %	Severity %	Disease Index	VSK %	DON ppm	30 SSW[1] g	micro TWT g	Heading d from 6-1
2375	86.7	24.0	21.6	26.7	8.8	22.7	9.9	33
Wheaton	100.0	65.7	65.7	66.7	15.6	11.9	9.4	35
Bacup	85.0	22.7	21.1	15.7	5.6	15.2	10.6	30
Oslo	100.0	72.5	72.5	61.7	12.9	8.3	8.9	34
ND2710	40.0	7.9	3.2	8.0	2.2	32.5	11.4	33
Rugby	–[2]	–[2]	–[2]	21.7	8.4	21.8	10.2	42
SD3934	61.7	7.5	5.0	6.7	2.6	22.9	11.3	33
SD4041	83.3	20.2	16.9	14.0	3.3	18.6	10.3	30
SD4042	100.0	52.3	52.3	14.7	12.9	11.7	10.6	34
SD4059	48.3	7.9	4.6	13.3	3.0	25.3	10.5	32
SD4066	95.0	20.0	18.9	17.3	5.8	17.9	10.4	38
MN00209-3-1	40.0	10.7	4.4	7.3	2.3	24.7	10.8	31
MN00261-4	76.7	12.7	10.5	15.0	6.1	24.4	11.0	37
MN01311-A-1	95.0	18.2	17.3	17.3	7.9	24.3	10.7	36
MN02222-1	68.3	9.1	6.4	9.0	2.1	21.2	10.5	35
MN02268-A-4	88.3	16.5	15.0	31.7	7.5	13.6	10.2	35
M05/1-14	43.3	6.0	2.6	6.7	1.0	18.6	11.1	33
M05/1-15	71.7	11.1	7.9	6.0	3.0	23.3	11.1	31
M05/1-16	90.0	15.9	14.9	14.0	6.0	19.1	10.8	34
M05/1-17	50.0	10.2	5.1	10.0	3.8	22.8	11.2	36
M05/1-18	83.3	15.0	12.7	14.0	5.9	24.9	10.5	33
NDSW0430	91.7	18.2	16.6	15.7	5.4	19.3	10.4	35
00S0244-23	78.3	15.4	12.8	45.0	10.4	16.4	9.5	34
00S0251-6	90.0	18.9	17.7	18.3	4.2	14.3	10.0	32
00S0327-18	76.7	13.1	10.4	20.7	4.7	22.2	10.4	31
01S0380-18	100.0	28.3	28.3	35.0	8.8	15.3	9.9	32
BW357	96.7	29.5	28.5	16.3	3.8	22.3	10.7	32
05M SP5	83.3	20.9	18.6	16.3	12.4	19.3	11.1	38
CA905-753	8.3	6.0	0.5	3.3	1.2	22.7	11.4	38
CA905-754	18.3	7.7	1.6	5.3	2.4	17.5	10.5	35
CA-905-755	61.7	15.2	10.1	11.0	5.0	13.6	10.0	35
CA-905-750	88.3	12.9	11.6	10.7	3.7	21.2	11.0	33
CA803-737	–[2]	–[2]	–[2]	19.0	10.1	28.7	10.5	38
DG013141	–[2]	–[2]	–[2]	13.0	5.3	35.6	10.4	39
DG012166	–[2]	–[2]	–[2]	18.3	8.8	30.7	10.5	39
Mean	73.9	19.7	17.2	18.4	6.1	20.7	10.6	34.4
LSD	25.6	14.0	14.8	9.5		6.4	0.8	2.5
CV	21.2	43.5	52.5	31.6		18.8	4.9	4.4

[1]30 SSW = 30 spike seed weight. This is the sample used to determine VSK.

[2] Missing data is due to late heading of the durum lines.

Table 4. 2006 Uniform Regional Scab Nursery for Spring Wheat Parents, Glenlea, Canada.

Line	Disease Index[a]	FDK %	DON %
2375	43.8	16.6	5.9
Wheaton	44.0[d]	28.3	12.9
Bacup	34.9[b]	3.4	2.2
Oslo	59.5[d]	7.2	3.5
ND2710	31.8[c]	13.1	4.5
SD3934	17.1	3.8	2.8
SD4041	2.1	3.3	1.3
SD4042	49.5[c]	4.1	2.9
SD4059	23.5	6.2	2.9
SD4066	27.0[b]	12.6	6.0
MN00209-3-1	9.1	2.9	1.9
MN00261-4	20.4	5.3	2.8
MN01311-A-1	29.3[b]	8.0	4.6
MN02222-1	6.9	2.4	1.4
MN02268-A-4	16.8	5.5	2.7
NDSW0430	13.3	10.4	4.6
00S0244-23	9.3[b]	8.1	3.9
00S0251-6	18.3	5.8	3.6
00S0327-18	38.2	12.4	5.9
01S0380-18	32.0	13.9	6.0
BW357	33.4	7.6	3.7
05M SP5	42.0[c]	3.1	3.4
CA905-753	6.8	4.2	1.8
CA905-754	15.7	3.1	1.6
CA-905-755	7.8	6.1	4.4
CA-905-750	23.0	9.7	4.2
CA803-737	36.7[b]	9.2	10.1
DG013141	9.9	7.1	6.1
DG012166	58.5[d]	11.7	10.4
Rugby	*	*	*
M05/1-14	*	*	*
M05/1-15	*	*	*
M05/1-16	*	*	*
M05/1-17	*	*	*
M05/1-18	*	*	*
Mean	18.8	8.1	4.4

[a] Mean of 4 reps except as noted

[b] 3 reps

[c] 2 reps

[d] 1 rep

* Entries not evaluated

Table 5. 2006 Uniform Regional Scab Nursery for Spring Wheat Parents, Means and Ranks Across Locations.

Line	Incidence %	Incidence Rank	Severity %	Severity Rank	Disease Index	Disease Index Rank	VSK % [a]	VSK Rank	DON ppm	DON Rank
No. of Locations	**2**	**2**	**2**	**2**	**3**	**3**	**3**	**3**	**2**	**2**
2375	90.0	20	22.8	22	28.5	27	28.9	31	7.3	27
Wheaton	100.0	31	60.5	35	55.0	33	61.1	35	14.3	35
Bacup	81.7	11	23.1	23	25.9	23	11.7	18	3.9	13
Oslo	99.2	29	51.8	30	54.2	32	46.3	34	8.2	31
ND2710	68.3	6	10.2	3	15.7	16	8.5	8	3.4	10
Rugby	100.0	31	59.7	34	59.7	35	42.5	33	8.4	32
SD3934	70.8	8	8.5	1	10.0	6	4.9	3	2.7	7
SD4041	90.8	21	17.5	16	11.2	7	8.8	10	2.3	6
SD4042	95.8	25	34.8	29	39.3	30	7.8	7	7.9	29
SD4059	70.0	7	13.5	7	15.2	13	9.3	13	3.0	8
SD4066	97.5	28	26.4	27	26.3	24	13.9	23	5.9	22
MN00209-3-1	59.2	3	9.9	2	6.9	1	6.0	6	2.1	5
MN00261-4	88.3	16	26.3	26	23.6	22	9.2	12	4.4	16
MN01311-A-1	96.7	26	18.8	18	21.9	21	10.7	17	6.3	25
MN02222-1	81.7	11	11.7	5	8.9	4	5.8	5	1.8	3
MN02268-A-4	93.3	24	18.9	19	17.6	19	17.4	26	5.1	19
M05/1-14	60.8	4	11.8	6	8.4	2	5.2	4	1.0	1
M05/1-15	75.8	9	10.9	4	8.4	2	3.8	1	3.0	8
M05/1-16	89.2	18	17.9	17	16.4	17	13.7	22	6.0	24
M05/1-17	64.2	5	13.6	8	9.7	5	10.0	15	3.8	11
M05/1-18	85.8	14	16.6	12	14.4	10	12.5	20	5.9	22
NDSW0430	91.7	22	17.3	15	15.2	13	11.8	19	5.0	18
00S0244-23	82.5	13	17.0	14	13.2	8	24.4	28	7.1	26
00S0251-6	86.7	15	15.8	11	15.6	15	9.3	13	3.9	13
00S0327-18	88.3	16	14.7	9	21.6	20	15.5	25	5.3	20
01S0380-18	99.2	29	26.1	25	27.9	26	26.9	30	7.4	28
BW357	96.7	26	25.1	24	27.3	25	13.0	21	3.8	11
05M SP5	89.2	18	27.0	28	30.9	28	10.4	16	7.9	29
CA905-753	54.2	1	21.3	21	14.6	11	14.7	24	1.5	2
CA905-754	57.5	2	16.6	12	14.0	9	4.0	2	2.0	4
CA-905-755	80.8	10	21.0	20	14.9	12	9.0	11	4.7	17
CA-905-750	91.7	22	15.4	10	17.2	18	8.7	9	3.9	13
CA803-737	100.0	31	56.5	32	46.6	31	21.6	27	10.1	34
DG013141	100.0	31	57.0	33	33.5	29	24.5	29	5.7	21
DG012166	100.0	31	56.2	31	57.3	34	32.8	32	9.6	33
Mean	85.1		24.9		23.6		16.1		5.3	

[a] For purposes of this table, VSK, FDK and Tombstone % were considered to be approximately equal for purposes of obtaining means across locations.

NOTE: See individual location summaries to identify instances where means may not be from the indicated number of locations due to missing data (particularly durums).

Table 6. Correlation Coefficients Between Traits by Location.

Correlation Between	Brookings	Crookston	Glenlea
Incidence & Severity	0.58	0.60	
Incidence & Disease Index	0.61	0.65	
Severity & Disease Index	1.00	1.00	
Incidence & Tombstone or VSK	0.44	0.55	
Severity & Tombstone or VSK	0.78	0.79	
Disease Index & Tombstone/VSK/FDK	0.78	0.79	0.44
Incidence & DON		0.66	
Severity & DON		0.81	
Disease Index & DON		0.82	0.52
VSK/FDK & DON		0.78	0.82

Table 7. Correlation Coefficients* Between Trait Means Across Locations.

	Incidence %	Severity %	Disease Index	VSK %[a]	DON ppm
Incidence %					
Severity %	0.64				
Disease Index	0.68	0.94			
VSK %	0.55	0.80	0.81		
DON ppm	0.73	0.78	0.83	0.81	

* Correlation coefficients were calculated using means in Table 5.

[a] For calculations, VSK, FDK, tombstone assumed to be approximately equal