

Report of the 2007 Uniform Regional Scab Nursery for Spring Wheat Parents

Coordinator: David F. Garvin

USDA-ARS, Plant Science Research Unit
411 Borlaug Hall, University of Minnesota
1991 Upper Buford Circle, St. Paul, MN 55108

Report prepared by: David F. Garvin and Zachary Blankenheim

The Uniform Regional Scab Nursery for Spring Wheat Parents (URSN) was grown for the 13th year in 2007. Five mist-irrigated locations at Brookings, SD, St. Paul and Crookston, MN, Prosper, ND, and Glenlea, Manitoba, Canada were planted. Due to less-than-ideal environmental conditions producing suboptimal results, St. Paul and Prosper are not included in the cross-location means summary, though the results of these locations are reported individually in this report.

A total of 48 entries were included in the 2007 URSN, including the resistant checks 2375, BacUp, and ND2710, and the susceptible checks Wheaton and Oslo. Rugby was included as a durum check. The other 42 entries were contributed by 11 university, industry, and national breeding programs. Four entries were durum wheat, and the rest 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, \cong FDK). 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.

This material is based upon work supported by the U.S. Department of Agriculture, in cooperation with the U.S. Wheat & Barley Scab Initiative. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the authors and do not necessarily reflect the view of the U.S. Department of Agriculture.

St. Paul, MN
January, 2008

CONTENTS	PAGE
Cooperating Agencies, Stations and Personnel	1
Table 1. List of Entries in the 2007 URSN	2
Tables 2-6. Nursery Data by Individual Location	3-7
Table 7. Trait Means Across Locations, with Rankings	8
Table 8. Correlations Between Traits by Location	9
Table 9. Correlations Between Traits Across Locations	10

Cooperators for the 2007 Uniform Regional Scab Nursery for Spring Wheat Parents

North Dakota State University (Prosper):

Mohamed Mergoum

South Dakota State University (Brookings):

Karl Glover

University of Minnesota (St. Paul, Crookston):

Jim Anderson, Ruth Dill-Macky, and John Wiersma

Agri-Food Canada, Glenlea, Manitoba:

Jeannie Gilbert and Gavin Humphreys

Table 1. Entries for the Uniform Regional Scab Nursery for Spring Wheat Parents, 2007.

Entry No.	Name	Pedigree	First Year Entered	Source
1	2375	CHECK		
2	Wheaton	CHECK		
3	Bacup	CHECK		
4	Oslo	CHECK		
5	ND2710	CHECK		
6	Rugby*	DURUM CHECK		
7	SD3851	ND2897/SD3219//SD3414	2007	SDSU
8	SD4059	PI584914/SD3730//SD3641	2006	SDSU
9	FN1706-38	ND741/FHBC02-6	2007	SDSU
10	FN1706-185	PI155266/KNUDSON//SD3699/3/SD3746	2007	SDSU
11	FN1706-213	ND741/SD3714//ND744	2007	SDSU
12	NDSW0430	ND674//Grandin/ND614/3/ND2831	2006	NDSU
13	NDSW0714	PI 634196/Alsen//*2Alsen	2007	NDSU
14	NDSW0715	PI 634196/Alsen//*2Alsen	2007	NDSU
15	M05/1-14	SUMAI 3/STOA/ND674/3/TOKAI 66	2005	NDSU
16	M05/1-15	SUMAI 3/STOA/ND674/3/ND744	2005	NDSU
17	M05/1-16	FRONTANA/W9207//ND716/3/ND716 SELN.	2005	NDSU
18	M05/1-17	FUJIAN 5114-1/MN2538//ND716 SELN.	2005	NDSU
19	M05/1-18	FRONTANA/W9207//2*ND2940	2005	NDSU
20	MN00209-3-1	IDO530/SEARS 29	2006	UMN
21	MN02222-1	MN98389/MN97518	2006	UMN
22	MN01X074-14	MN99322 (Fujian 5114-1/MN2538(BacUp'S')/MN99192 (Fujian 5114-1/2375))	2007	UMN
23	MN03013-3-2	MN98446/MN98389	2007	UMN
24	MN03191-2-1	Ulen//Grandin/MN97518	2007	UMN
25	BW872	9229G-003B/AC Barrie//AC Elsa	2007	AAFC-SPARC
26	BA04-CH-1	BW 267/98B19*H257	2007	AAFC-CRC
27	BA07-DE-19	BW 267/98B19*N22	2007	AAFC-CRC
28	ES101	ES12/ES9	2007	AAFC-CRC
29	HY682	HY639 / 99 EPWAMdg 61	2007	AAFC-CRC
30	HY689	HY639 / 98 EPWAMdg 32 // HY644	2007	AAFC-CRC
31	CA905-749	Alsen/Knudson	2007	WB
32	CA905-750	Alsen/Knudson	2006	WB
33	CA905-776	Express/Knudson	2007	WB
34	CA806-804*	TA/D88303//Laker/3/FA898-787/4/Lebsock/5/Primo D'oro	2007	WB
35	CA806-805*	Belzer//Rugby/Duraking/3/Primo D'oro	2007	WB
36	CA806-806*	Duraking/Primo D'oro	2007	WB
37	CA806-807*	Rugby/Duraking//FA898-781	2007	WB
38	06MSP 18	Alsen//B1021/Norm	2007	TRI
39	06MSP 3	BRS 177/Prointa Granar	2007	TRI
40	01S0236-6	Hanna/98S0086-13	2007	AGP
41	01S0099-8	N99-0253/97S0205-01	2007	AGP
42	01S0377-6	Freyr/98S0167-09	2007	AGP
43	02S0227-6	99S0155-12/98S0086-07	2007	AGP
44	RIL39	Wheaton/Abura	2007	UMN
45	RIL64	Wheaton/Abura	2007	UMN
46	RIL83	Wheaton/Abura	2007	UMN
47	RIL60	Wheaton/Abura	2007	UMN
48	RIL80	Wheaton/Abura	2007	UMN

* Durum Entries

SDSU, South Dakota State Univ.; NDSU, North Dakota State Univ.; WB, Westbred

UMN, University of Minnesota; AGP, Agripro; TRI, Trigen

AAFC-CRC, Agriculture and Agri-Food Canada - Cereal Research Centre

AAFC-SPARC, Agriculture and Agri-Food Canada - Semiarid Prairie Agriculture Research Centre

Table 2. 2007 Uniform Regional Scab Nursery for Spring Wheat Parents, Brookings, SD.

Line	Incidence %	Severity %	Disease Index	Tombstone %
2375	98.3	42.7	42.0	3.0
Wheaton	100.0	72.8	72.8	88.3
Bacup	98.3	38.0	37.3	5.7
Oslo	100.0	48.7	48.7	36.7
ND2710	100.0	32.0	32.0	1.7
Rugby	100.0	38.3	38.3	88.3
SD3851	83.3	40.8	36.7	1.0
SD4059	100.0	38.2	38.2	4.7
FN1706-38	100.0	54.3	54.3	2.3
FN1706-185	100.0	35.8	35.8	3.0
FN1706-213	98.3	36.2	35.4	10.7
NDSW0430	100.0	29.3	29.3	1.0
NDSW0714	93.3	30.8	29.2	1.7
NDSW0715	100.0	42.5	42.5	3.7
M05/1-14	98.3	40.7	40.2	2.3
M05/1-15	96.7	39.2	38.3	2.3
M05/1-16	98.3	35.2	34.6	1.0
M05/1-17	95.0	42.7	41.2	16.7
M05/1-18	95.0	27.3	26.2	9.0
MN00209-3-1	96.7	40.5	39.7	1.7
MN02222-1	100.0	31.8	31.8	1.0
MN01X074-14	98.3	51.7	50.8	4.3
MN03013-3-2	98.3	38.5	38.0	1.7
MN03191-2-1	100.0	44.2	44.2	2.3
BW872	100.0	61.5	61.5	55.0
BA04-CH-1	93.3	28.8	27.0	1.7
BA07-DE-19	93.3	45.8	44.4	15.0
ES101	98.3	33.2	32.6	14.0
HY682	100.0	68.7	68.7	60.0
HY689	100.0	67.2	67.2	60.0
CA905-749	96.7	26.8	25.9	1.7
CA905-750	96.7	31.2	30.2	5.3
CA905-776	100.0	44.5	44.5	10.0
CA806-804	100.0	64.0	64.0	86.7
CA806-805	100.0	33.8	33.8	55.0
CA806-806	100.0	44.2	44.2	50.0
CA806-807	100.0	36.7	36.7	83.3
06MSP 18	96.7	43.5	42.3	1.7
06MSP 3	100.0	46.0	46.0	38.3
01S0236-6	100.0	43.7	43.7	3.7
01S0099-8	100.0	29.2	29.2	4.3
01S0377-6	100.0	36.0	36.0	1.0
02S0227-6	100.0	30.7	30.7	3.7
RIL39	100.0	34.3	34.3	1.7
RIL64	98.3	42.7	42.0	40.0
RIL83	90.0	31.7	28.8	1.7
RIL60	100.0	46.8	46.8	1.0
RIL80	100.0	47.3	47.3	1.7
Mean	98.2	41.5	40.9	18.5
LSD	NS	17.2	18.2	19.9
CV	3.3	26.4	27.3	147.0

Table 3. 2007 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	100.0	38.0	38.0	36.7	12.5	13.4	9.6	30
Wheaton	100.0	81.2	81.2	71.7	42.3	5.3	8.0	31
Bacup	100.0	26.4	26.4	20.0	9.8	14.4	10.8	24
Oslo	100.0	79.6	79.6	51.7	21.1	7.9	8.5	28
ND2710	77.5	6.4	4.9	9.3	5.6	22.7	11.1	27
Rugby	100.0	71.3	71.3	30.0	20.9	8.9	8.7	34
SD3851	90.0	11.5	10.4	15.7	5.5	16.2	11.0	23
SD4059	90.0	10.2	9.1	18.0	6.8	21.5	10.6	29
FN1706-38	80.0	11.2	9.0	14.7	5.8	18.1	11.1	26
FN1706-185	91.7	25.8	22.9	21.7	10.3	16.2	10.2	29
FN1706-213	100.0	30.5	30.5	26.7	13.4	13.7	10.0	28
NDSW0430	100.0	26.2	26.2	15.0	7.4	13.2	9.2	30
NDSW0714	98.3	26.7	26.0	14.7	9.6	9.0	10.4	31
NDSW0715	100.0	26.3	26.3	10.7	7.3	8.3	10.9	32
M05/1-14	67.5	8.9	6.1	7.3	3.9	16.0	10.8	29
M05/1-15	90.0	9.1	8.1	5.3	4.2	18.9	10.6	29
M05/1-16	100.0	68.9	68.9	31.7	18.7	7.0	9.6	30
M05/1-17	98.3	35.9	35.4	19.0	17.0	8.7	10.4	32
M05/1-18	78.3	14.4	11.4	7.3	3.8	15.9	11.0	34
MN00209-3-1	91.7	14.8	13.4	13.0	6.8	23.2	11.5	30
MN02222-1	100.0	15.4	15.4	10.0	3.6	15.0	10.9	30
MN01X074-14	91.7	9.6	8.7	13.7	5.8	18.0	11.2	32
MN03013-3-2	98.3	21.0	20.5	17.3	10.3	15.7	11.1	30
MN03191-2-1	100.0	45.5	45.5	11.7	6.0	12.8	10.7	30
BW872	100.0	32.3	32.3	25.0	7.6	11.7	9.7	32
BA04-CH-1	96.7	14.8	14.2	13.0	5.3	14.7	10.3	32
BA07-DE-19	98.3	24.1	23.6	12.0	6.2	10.5	10.6	33
ES101	96.7	79.6	77.0	30.0	19.4	6.2	8.6	33
HY682	71.7	41.5	28.0	23.3	11.7	10.6	9.3	36
HY689	95.0	24.4	22.5	15.7	4.9	14.4	10.1	33
CA905-749	95.0	20.9	20.3	12.0	6.7	14.5	11.3	32
CA905-750	90.0	10.9	9.8	11.0	7.4	17.0	11.1	32
CA905-776	100.0	75.6	75.6	31.7	21.0	8.9	9.2	32
CA806-804	100.0	50.4	50.4	25.0	18.2	9.2	8.4	35
CA806-805	100.0	80.3	80.3	36.7	22.7	8.2	9.3	34
CA806-806	98.3	60.5	59.7	26.7	16.4	9.6	9.4	34
CA806-807	100.0	74.4	74.4	31.7	18.9	10.1	8.3	32
06MSP 18	100.0	22.1	22.1	14.3	10.7	16.0	11.4	34
06MSP 3	100.0	76.6	76.6	45.0	18.4	9.7	8.8	26
01S0236-6	100.0	19.8	19.8	30.0	16.8	13.2	10.1	27
01S0099-8	100.0	19.5	19.5	14.7	6.0	15.2	10.9	31
01S0377-6	100.0	23.8	23.8	31.7	16.0	13.5	10.8	28
02S0227-6	96.7	15.3	15.0	24.0	13.6	14.4	11.5	26
RIL39	83.3	12.6	10.9	9.3	5.3	13.4	10.6	30
RIL64	68.3	6.8	4.6	9.3	3.1	16.5	11.5	29
RIL83	61.7	12.1	7.5	8.7	2.9	20.1	11.2	23
RIL60	100.0	17.1	17.1	22.3	6.9	12.9	10.0	28
RIL80	96.7	17.9	17.1	19.7	9.1	20.5	10.7	31
Mean	93.4	31.1	30.0	21.2	11.1	13.6	10.2	30.2
LSD	16.9	19.8	19.8	8.9		4.7		1.4
CV	11.1	39.3	40.6	25.8		21.2		2.9

¹30 SSW = 30 spike seed weight. This is the sample used to determine VSK.

Table 4. 2007 Uniform Regional Scab Nursery for Spring Wheat Parents, St. Paul, MN.

Line	Incidence %	Severity %	Disease Index	Heading d from 6-1
2375	68.3	14.0	9.4	19
Wheaton	83.3	34.9	31.1	20
Bacup	33.3	11.6	3.8	16
Oslo	76.7	22.0	16.7	19
ND2710	31.7	9.5	3.6	19
Rugby	82.5	28.1	23.8	21
SD3851	35.0	7.6	2.6	14
SD4059	57.5	9.9	6.9	19
FN1706-38	40.0	6.8	2.7	16
FN1706-185	50.0	12.5	6.3	19
FN1706-213	66.7	13.0	9.2	19
NDSW0430	61.7	8.5	5.3	19
NDSW0714	71.7	14.8	11.7	19
NDSW0715	61.7	12.1	7.3	19
M05/1-14	36.7	16.1	6.7	19
M05/1-15	46.7	10.1	4.8	19
M05/1-16	80.0	16.8	13.5	19
M05/1-17	80.0	13.5	10.9	19
M05/1-18	51.7	16.8	8.4	20
MN00209-3-1	36.7	8.4	3.0	19
MN02222-1	38.3	7.8	3.0	19
MN01X074-14	31.7	10.6	3.9	19
MN03013-3-2	51.7	12.8	7.2	19
MN03191-2-1	66.7	16.4	11.0	19
BW872	56.7	21.3	11.9	19
BA04-CH-1	51.7	10.2	5.9	19
BA07-DE-19	70.0	23.0	15.8	20
ES101	85.0	26.7	23.0	20
HY682	96.7	35.5	34.1	25
HY689	53.3	16.6	9.5	19
CA905-749	65.0	13.5	8.8	19
CA905-750	53.3	12.4	6.2	19
CA905-776	90.0	29.0	26.8	21
CA806-804	96.7	26.5	25.8	22
CA806-805	83.3	27.2	24.7	22
CA806-806	68.3	17.5	12.1	21
CA806-807	68.3	16.7	11.3	20
06MSP 18	60.0	17.8	10.3	21
06MSP 3	68.3	12.7	8.7	17
01S0236-6	58.3	11.2	6.5	17
01S0099-8	75.0	17.5	13.2	19
01S0377-6	76.7	13.8	10.5	19
02S0227-6	76.7	14.6	11.0	19
RIL39	28.3	12.8	3.7	19
RIL64	43.3	11.9	5.2	19
RIL83	40.0	9.0	3.7	14
RIL60	43.3	12.9	5.7	19
RIL80	45.0	15.2	6.8	21
Mean	60.1	15.8	10.7	19.2
LSD	25.6	9.6	9.8	1.7
CV	26.2	37.3	56.7	5.3

Note: Disease levels were low in this nursery. Only the susceptible checks had VSK values over 10%. Therefore, VSK, 30 spike seed weight, micro test weights and DON values are not reported.

Table 5. 2007 Uniform Regional Scab Nursery for Spring Wheat Parents, Glenlea, Canada.

Line	Disease Index	FDK %	DON %
2375	25.1	7.3	3.8
Wheaton	39.0	17.6	11.7
Bacup	36.5	2.7	0.9
Oslo	44.6	13.2	6.2
ND2710	24.1	1.3	0.2
Rugby*	46.0	4.8	3.4
SD3851	16.6	2.5	0.7
SD4059**	N/A	30.0	1.8
FN1706-38	11.8	2.3	0.4
FN1706-185	16.9	3.6	1.2
FN1706-213	16.5	6.5	1.5
NDSW0430	15.5	3.3	1.1
NDSW0714	44.1	8.7	2.7
NDSW0715	19.3	7.4	2.9
M05/1-14	22.8	2.7	0.4
M05/1-15	8.6	2.1	1.1
M05/1-16	18.3	7.1	4.5
M05/1-17	15.0	9.7	5.2
M05/1-18	30.1	1.9	0.5
MN00209-3-1	12.3	2.1	0.8
MN02222-1	14.0	1.7	0.6
MN01X074-14	38.8	3.8	1.4
MN03013-3-2	19.6	3.5	1.2
MN03191-2-1	20.8	2.4	0.8
BW872	37.4	6.3	0.8
BA04-CH-1	20.8	3.8	1.7
BA07-DE-19	27.9	3.5	0.8
ES101	36.3	12.2	3.5
HY682	25.9	7.2	2.5
HY689	7.1	2.3	1.0
CA905-749	10.7	4.3	1.8
CA905-750	10.0	3.5	1.4
CA905-776	42.0	11.5	4.1
CA806-804	39.5	8.8	6.6
CA806-805	45.8	8.9	5.5
CA806-806	32.1	7.1	4.3
CA806-807	34.5	9.3	8.2
06MSP 18	39.2	5.6	2.1
06MSP 3	13.4	4.2	2.3
01S0236-6	4.3	3.7	1.5
01S0099-8	6.8	3.0	1.2
01S0377-6*	29.3	3.0	1.5
02S0227-6	27.8	3.9	1.6
RIL39	19.0	1.3	0.5
RIL64	19.1	2.5	0.8
RIL83	19.1	1.3	0.2
RIL60	31.9	1.5	0.5
RIL80*	33.0	10.0	2.3
Mean	24.9	5.8	2.3

* Only three out of four reps evaluated

**Only one out of four reps evaluated for FDK and DON

Table 6. 2007 Uniform Regional Nursery for Spring Wheat Parents, Prosper, ND.

Line	Severity %
2375	31.8
Wheaton	44.4
Bacup	34.0
Oslo	53.3
ND2710	35.1
Rugby	48.1
SD3851	39.9
SD4059	34.2
FN1706-38	37.3
FN1706-185	45.8
FN1706-213	47.1
NDSW0430	33.4
NDSW0714	33.1
NDSW0715	23.3
M05/1-14	25.8
M05/1-15	40.0
M05/1-16	33.5
M05/1-17	26.3
M05/1-18	23.3
MN00209-3-1	36.2
MN02222-1	22.7
MN01X074-14	29.4
MN03013-3-2	36.8
MN03191-2-1	40.5
BW872	33.9
BA04-CH-1	20.0
BA07-DE-19	26.6
ES101	34.8
HY682	35.1
HY689	37.9
CA905-749	18.5
CA905-750	14.7
CA905-776	34.8
CA806-804	72.8
CA806-805	49.4
CA806-806	48.3
CA806-807	66.1
06MSP 18	31.5
06MSP 3	52.2
01S0236-6	45.0
01S0099-8	22.4
01S0377-6	22.7
02S0227-6	40.5
RIL39	30.8
RIL64	36.8
RIL83	45.3
RIL60	34.4
RIL80	20.5
Mean	36.0

Heat waves during the flowering period of the URSN and other nurseries caused difficulties in uniform inoculation. More importantly spikes dried out very fast, making it difficult to differentiate if dry spikelets were due to FHB or heat.

**Table 7. 2007 Uniform Regional Scab Nursery for Spring Wheat Parents,
Summary of Means Across Mist-Irrigated Locations.**

Line	Incidence %	Incidence Rank	Severity %	Severity Rank	Disease Index	Disease Index Rank	VSK %	VSK Rank	DON ppm	DON Rank
No. of Locations	2	2	2	2	3	3	3	3	2	2
2375	99.2	27	40.3	33	35.1	34	15.7	33	8.2	34
Wheaton	100.0	32	77.0	48	64.3	48	59.2	48	27.0	48
Bacup	99.2	27	32.2	25	33.4	32	9.5	24	5.4	25
Oslo	100.0	32	64.1	47	57.6	47	33.9	44	13.7	46
ND2710	88.8	7	19.2	1	20.3	6	4.1	3	2.9	7
Rugby	100.0	32	54.8	39	51.9	44	41.0	46	12.2	42
SD3851	86.7	5	26.2	15	21.2	9	6.4	12	3.1	10
SD4059	95.0	13	24.2	11	23.6	16	17.6	35	4.3	20
FN1706-38	90.0	8	32.8	27	25.0	19	6.4	12	3.1	10
FN1706-185	95.9	19	30.8	22	25.2	20	9.4	23	5.8	27
FN1706-213	99.2	27	33.3	29	27.5	22	14.6	31	7.5	32
NDSW0430	100.0	32	27.8	17	23.7	17	6.4	12	4.3	20
NDSW0714	95.8	16	28.8	18	33.1	31	8.4	22	6.2	29
NDSW0715	100.0	32	34.4	30	29.4	23	7.3	17	5.1	24
M05/1-14	82.9	2	24.8	14	23.0	15	4.1	3	2.2	4
M05/1-15	93.3	10	24.1	10	18.4	2	3.2	1	2.7	6
M05/1-16	99.2	27	52.0	37	40.6	36	13.3	30	11.6	41
M05/1-17	96.7	20	39.3	32	30.5	25	15.1	32	11.1	39
M05/1-18	86.7	5	20.9	2	22.6	13	6.1	10	2.2	4
MN00209-3-1	94.2	12	27.7	16	21.8	11	5.6	8	3.8	18
MN02222-1	100.0	32	23.6	8	20.4	7	4.2	6	2.1	3
MN01X074-14	95.0	13	30.6	21	32.7	30	7.3	17	3.6	15
MN03013-3-2	98.3	23	29.8	19	26.0	21	7.5	20	5.8	27
MN03191-2-1	100.0	32	44.8	34	36.8	35	5.5	7	3.4	12
BW872	100.0	32	46.9	36	43.7	38	28.8	40	4.2	19
BA04-CH-1	95.0	13	21.8	4	20.7	8	6.2	11	3.5	13
BA07-DE-19	95.8	16	35.0	31	32.0	26	10.2	25	3.5	13
ES101	97.5	21	56.4	42	48.6	42	18.7	37	11.5	40
HY682	85.9	4	55.1	40	40.8	37	30.2	42	7.1	31
HY689	97.5	21	45.8	35	32.2	28	26.0	38	3.0	9
CA905-749	95.8	16	23.9	9	19.0	5	6.0	9	4.3	20
CA905-750	93.3	10	21.0	3	16.7	1	6.6	15	4.4	23
CA905-776	100.0	32	60.1	45	54.0	46	17.7	36	12.6	44
CA806-804	100.0	32	57.2	44	51.3	43	40.2	45	12.4	43
CA806-805	100.0	32	57.1	43	53.3	45	33.5	43	14.1	47
CA806-806	99.2	27	52.3	38	45.3	39	27.9	39	10.4	37
CA806-807	100.0	32	55.5	41	48.5	41	41.4	47	13.6	45
06MSP 18	98.3	23	32.8	27	34.5	33	7.2	16	6.4	30
06MSP 3	100.0	32	61.3	46	45.3	39	29.2	41	10.4	37
01S0236-6	100.0	32	31.7	23	22.6	13	12.5	29	9.2	36
01S0099-8	100.0	32	24.3	12	18.5	3	7.3	17	3.6	15
01S0377-6	100.0	32	29.9	20	29.7	24	11.9	28	8.8	35
02S0227-6	98.4	25	23.0	6	24.5	18	10.5	26	7.6	33
RIL39	91.7	9	23.5	7	21.4	10	4.1	3	2.9	7
RIL64	83.3	3	24.7	13	21.9	12	17.3	34	2.0	2
RIL83	75.9	1	21.9	5	18.5	3	3.9	2	1.6	1
RIL60	100.0	32	32.0	24	32.0	26	8.3	21	3.7	17
RIL80	98.4	25	32.6	26	32.5	29	10.5	26	5.7	26
Mean	95.9		36.9		32.3		15.2		6.7	

Note: Prosper and St. Paul locations were not included in this summary (see respective individual location notes for reasons).

Table 8. Correlation coefficients between traits, by location.

Correlation Between	Brookings	Crookston	St. Paul	Glenlea
Incidence & Severity	0.25	0.45	0.75	
Incidence & Disease Index	0.32	0.50	0.86	
Incidence & Tombstone/FDK/VSK	0.29	0.45		
Incidence & DON		0.46		
Severity & Disease Index	1.00	1.00	0.97	
Severity & Tombstone/FDK/VSK	0.58	0.79		
Severity & DON		0.83		
Disease Index & Tombstone/FDK/VSK	0.59	0.80		0.56
Disease Index & DON		0.84		0.48
Tombstone/FDK/VSK & DON		0.92		0.60

Table 9. Correlation coefficients among traits.

	Incidence %	Severity %	Disease Index	VSK %
Incidence %				
Severity %	0.44			
Disease Index	0.47	0.96		
VSK %	0.34	0.86	0.85	
DON ppm	0.48	0.83	0.83	0.82

Note: Correlation coefficients calculated using means across locations (table 7).