

2002 Uniform Regional Scab Nursery for Spring Wheat Parents

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The Uniform Regional Scab Nursery was grown for the eighth year in 2002. Six locations were included in the nursery, including Brookings, SD; St. Paul and Crookston, MN; Prosper and Langdon, ND; and Glenlea, MB, Canada. Data were obtained from all locations for inclusion in this report. A total of 44 entries were included in the nursery in 2002. This included the resistant checks 2375, BacUp, and ND2710, and the susceptible checks Wheaton and Oslo. The other 39 entries were contributed by the University of Minnesota, North Dakota State University, South Dakota State University, Agriculture and Agri-Food Canada, Western Plant Breeders, and Agripro. Seven of these 39 entries were durums. Five genotypes from South Dakota (PI entries) represent possible new sources of scab resistance and were included in the nursery.

The field data collected at each location varied, but a core set of traits evaluated on entries at 5 locations or more included incidence of scab (expressed as % infected heads), disease severity (expressed as % of diseased florets on infected heads), disease index (incidence x severity/100), and visual scabby kernel ratings (VSK, \cong tombstone), expressed as % kernels in a grain sample. Additionally, 4 locations provided grain deoxynivalenol (DON) concentrations, expressed as ppm in a grain sample. Other trait data were gathered at the different locations, and are presented in the individual location tables. A final table reporting overall entry means for parameters across locations is included after individual location data tables. Further, relative rankings of entries for disease incidence, disease severity, disease index, VSK and DON are provided as new tables in this year's report.

Disease pressure varied from location to location, with mean disease incidence ranging from a low of 52.3% for Langdon to a high of 99.8% at Brookings. Mean location severities ranged from 7.7% at Langdon to 67.4% at Prosper, while mean disease index ranged from 4.8% at Langdon to 46.9% at Brookings. Mean VSK ranged from 8% at Crookston to 46.5% at Prosper. It should be noted that the nursery locations in Minnesota do not record VSK ratings if they exceed 50%, and thus the VSK means at these locations will be biased towards values lower than the true means. Mean location DON concentrations ranged from 3.5 ppm at Crookston to 36.9 ppm at Prosper.

Correlation coefficients were calculated between disease index, VSK, and DON, using overall means calculated from the locations at which each of these parameters was measured. The correlations among these parameters were in each instance positive and significant. The correlation between disease index and VSK (4 locations) was 0.91, while disease index and DON (3 locations) exhibited a correlation of 0.85. Lastly, VSK and DON (3 locations) also exhibited a significant correlation (0.77).

Cooperators for 2002 Uniform Regional Scab Nursery for Spring Wheat Parents

Richard Frohberg, John Lukach, Mohamed Mergoum and Robert Stack
North Dakota State University

Yue Jin and Karl Glover
South Dakota State University

Jim Anderson, Ruth Dill-Macky and John Wiersma
University of Minnesota

Jeannie Gilbert and Gavin Humphreys
Agri-Food Canada, Winnipeg, Manitoba

Table 1. Entries in the Uniform Regional Scab Nursery for Spring Wheat Parents, 2002.

Entry No.	Name	Pedigree	Source
1	2375	CHECK	ND
2	Wheaton	CHECK	MN
3	BacUp	CHECK	MN
4	Oslo	CHECK	AGP
5	ND2710	CHECK	ND
6	ND3020	ND2831//Parshall/ND706	ND
7	ND3078	ND2849/ND721	ND
8	ND3085	ND2891/ND721	ND
9	ND3088	Kadett/Bobwhite sib//Grandin/3/ND706	ND
10	ND3098	Arsenal//Korm./Rohau72-839/3/Parshall/4/ND706	ND
11	98B08*A59	93B42-V2A/BW 252	MAN
12	98B08*B111	93B42-V2A/BW 252	MAN
13	98B19*N22	93B42-V2A/2*BW 252	MAN
14	98B19*S87	93B42-V2A/2*BW 252	MAN
15	98B19*T99	93B42-V2A/2*BW 252	MAN
16	SD3533	ND671/SD8072	SD
17	SD3686	SD3290/MN91309//SD8070	SD
18	SD3692	SD3356/3/Sumai3/SD3080//2375/4/SD3236	SD
19	SD3696	SD3367/KS93U76//SD3164	SD
20	SD3718	SD3390/SD3400//SD3164	SD
21	N99-0107	N94-0157//Sumai#3/Dalen	AGP
22	98S0146-01	N92-0098//Sumai#3/Dalen/3/Russ/W95-0188	AGP
23	98S0084-11	N96-0124/3/N93-0161//Sumai33/Dalen	AGP
24	98S3015-01	HY444/3/N92-0098//Sumai#3/Dalen	AGP
25	98S0018-06	Norlander/3/N92-0098//Sumai#3/Dalen	AGP
26	CA-901-712	Express x Impervo	WPB
27	FA-900-720	Russ x Impervo	WPB
28	CA-801-717*	Belzer x FA-898-785	WPB
29	CA-801-748*	88303//Rugby/Scab Res. Pop.///087250	WPB
30	MN99225	MN2538/SD3161	MN
31	MN99408	MN94151*2/MN2538	MN
32	MN00021	ND2763/HJ98	MN
33	MN00173	MN95286/MN94155//Oxen	MN
34	MN00274	McVey//Vance/MN2540W	MN
35	D011503*	Sumai3/Sceptre//D88816	ND
36	D011512*	Sceptre/Sumai3//Sceptre	ND
37	D011521*	Medora//Sumai3/Medora	ND
38	D011515*	Wangshuibai/Ben//Ben	ND
39	D011527*	Lebsock/Ldn(Dic-3A)	ND
The following entries are potential new sources of scab resistance from Yue Jin:			
40	PI 168727	Klein Sinmarq/Eureka F.C.S.	Argentina
41	PI 345731	Frontana//Thatcher/Sinvalocho	Argentina
42	PI 163429	Unknown	Argentina
43	PI 264940	Landrace	Greece
44	PI 185843	Polyssu/Alfredo Chaves 6-21	Brazil

*Durum

Table 2. 2002 Uniform Regional Scab Nursery for Spring Wheat Parents, Glenlea, MB, CAN.

Line	Anthesis d from 6-1	Incidence %	Severity %	Disease %	DON ppm
2375	42	83.8	76.3	64.1	15.3
Wheaton	44	86.3	73.8	65.6	13.9
BacUp	39	60	33.8	20.6	5
Oslo	45	95	91.3	86.8	17.2
ND2710	42	50	30	15.3	3.8
ND3020	41	71.3	67.5	50.4	9.5
ND3078	42	71.3	68.8	50.6	8.1
ND3085	40	47.5	23.8	11.5	7.4
ND3088	43	66.3	33.8	22.5	6
ND3098	42	61.3	50	36	8.2
98B08*A59	42	76.3	70	53.8	4.7
98B08*B111	44	47.5	52.5	25.8	3.5
98B19*N22	43	81.3	67.5	53.9	10.9
98B19*S87	43	60	57.5	40.2	12.2
98B19*T99	44	71.3	67.5	47.4	8.5
SD3533	41	81.3	66.3	55.5	12.8
SD3686	41	70	42.5	29.5	5.6
SD3692	39	68.8	32.5	23.8	9.2
SD3696	41	43.8	37.5	19	2.5
SD3718	42	82.5	80	66.6	12.7
N99-0107	43	83.8	61.3	50.9	12.3
98S0146-01	42	67.5	35	24	6.3
98S0084-11	41	68.8	30	22.8	15.8
98S3015-01	43	86.3	80	69.1	10.5
98S0018-06	41	81.3	72.5	60.8	13.1
CA-901-712	44	80	65	53.5	11.7
FA-900-720	45	53.8	22.5	13	2.3
CA-801-717	47	73.8	61.3	48.8	11.1
CA-801-748	45	90	83.8	76	12.4
MN99225	41	71.3	66.3	47.9	7.1
MN99408	40	51.3	28.8	15.5	5.9
MN00021	42	76.3	40	30.9	4.9
MN00173	39	57.5	65	38	6.9
MN00274	41	40	25	10.6	3.5
D011503	45	82.5	45	37	8.4
D011512	46	77.5	38.8	31	11.1
D011521	44	78.8	41.3	33.1	13.5
D011515	44	81.3	61.3	51	14.2
D011527	43	63.8	56.3	36.1	8.7
PI 168727*	46	66.3	67.5	44.5	7.9
PI 345731*	39	38.8	47.5	19	4.9
PI 163429*	43	52.5	70	36.5	6.6
PI 264940*	49	60	60	36.6	3.7
PI 185843*	49	55	53.8	29.8	2.5
Mean	43	68.5	54.5	39.9	8.7
LSD (0.05)	3	21.6	20.5	21.5	6.2
CV	5	22.6	26.9	38.5	51.4

*Grown in a separate area of the nursery due to blocking considerations and nursery design.

Table 3. 2002 Uniform Regional Scab Nursery for Spring Wheat Parents, Crookston, MN.

Line	Heading d from 6-1	Incidence %	Severity %	Disease %	Wt. of 30 heads grams	VSK %	DON ppm
2375	35	80	30.3	24.2	23	15	5.7
Wheaton	35	100	65.8	65.8	17.8	40	10.6
BacUp	31	60	13.3	8	18.2	4	2.2
Oslo	31	90	59	53.1	21.6	20	5
ND2710	32	20	8.5	1.7	23	2	0.8
ND3020	32	40	15.8	6.3	19	4	4.6
ND3078	35	75	28.1	21.1	12.2	6	4.7
ND3085	32	30	9.3	2.8	19.3	4	1.3
ND3088	35	55	13.2	7.3	20.9	8	1.8
ND3098	33	70	12.3	8.6	20.6	8	4.7
98B08*A59	38	25	21.6	5.4	18	2	1.6
98B08*B111	39	10	11	1.1	18.5	4	1.3
98B19*N22	36	20	8.5	1.7	17.1	4	2.9
98B19*S87	37	70	12.3	8.6	16.5	6	3.2
98B19*T99	37	40	15.8	6.3	17.8	6	3.9
SD3533	33	25	6	1.5	20	10	4.6
SD3686	32	45	15.9	7.2	21.8	8	3.4
SD3692	32	50	8	4	17.6	10	4.5
SD3696	33	15	12.7	1.9	18.1	4	1.7
SD3718	33	100	35.2	35.2	19.2	12	4.7
N99-0107	35	75	19.1	14.3	25.1	8	4.5
98S0146-01	34	30	7.7	2.3	19.5	4	2.5
98S0084-11	34	60	17.4	10.4	16.7	4	2.4
98S3015-01	35	80	25.4	20.3	22.5	8	4.1
98S0018-06	34	65	28.4	18.5	16.3	12	4.1
CA-901-712	30	100	52.3	52.3	22.6	8	3
FA-900-720	36	30	10.8	3.2	20.8	6	1.1
CA-801-717	39	35	17.1	6	34.2	10	5.2
CA-801-748	38	65	27	17.6	16.5	12	6.4
MN99225	34	35	14.3	5	18.6	4	1.6
MN99408	32	50	9	4.5	19.2	6	1.9
MN00021	32	30	6	1.8	22.1	6	1.8
MN00173	33	5	6	0.3	21.2	6	2.4
MN00274	34	20	8.5	1.7	15.4	4	0.8
D011503	38	80	44.5	35.6	16.2	10	4.1
D011512	37	100	34.4	34.4	27.1	10	4.9
D011521	37	100	31.4	31.4	19.7	10	4.7
D011515	38	90	34.2	30.8	19.4	20	6.3
D011527	36	70	21.4	15	31.2	8	5.3
PI 168727	36	25	19.6	4.9	17.8	6	2.8
PI 345731	30	40	15.8	6.3	22.7	8	2.4
PI 163429	34	40	14.5	5.8	19.8	6	2.2
PI 264940	37	80	9.7	7.8	27.1	10	3.4
PI 185843	38	30	27.2	8.2	19.7	6	1.2
Mean	35	53.5	20.6	13.9	20.3	8	3.5

Note: Data are from one rep

Table 4. 2002 Uniform Regional Scab Nursery for Spring Wheat Parents, St. Paul, MN.

Line	Heading d from 6-1	Incidence %	Severity %	Disease %	Wt. of 30 heads grams	VSK %	DON ppm
2375	26	88.3	34.3	32.7	17.1	17.3	4.7
Wheaton	28	100	73.7	73.7	10.3	66.7	9.9
BacUp	22	66.7	24.5	18	13.9	17.3	4.1
Oslo	22	100	65	65	8.6	66.7	10
ND2710	23	58.3	13.2	7.4	18.4	16.3	4.7
ND3020	24	91.7	23.3	21.1	11.6	38.3	11.5
ND3078	24	83.3	24.4	20.7	13.2	23.3	7.1
ND3085	23	83.3	28.2	23.1	12.7	14	4.8
ND3088	26	95	28	26.8	12.2	21.7	5.8
ND3098	25	96.7	38	37.1	10.3	26.7	9.7
98B08*A59	27	85	17.1	14.6	10.2	14	3.9
98B08*B111	28	75	14.8	11	14	14	4.6
98B19*N22	27	75	17.6	13.4	10.9	18	3.5
98B19*S87	28	100	41.4	41.4	10.3	28.3	4.9
98B19*T99	28	85	25.7	22.5	11.6	23.3	4.3
SD3533	22	95	37.4	35.2	11.4	53.3	7.8
SD3686	22	90	27.2	24.5	15.3	18.3	4.5
SD3692	22	80	25	20.2	12.3	36.7	7.1
SD3696	24	41.7	11.1	4.8	15.3	7.3	2.5
SD3718	23	96.7	43.6	42	12.4	36.7	5.8
N99-0107	26	95	22.7	21.7	13.5	20	6.9
98S0146-01	26	55	11.2	6.1	16.1	6.7	1.9
98S0084-11	25	75	19	15.9	10.3	11.7	5.7
98S3015-01	26	98.3	26	25.5	13.6	10.3	4.2
98S0018-06	25	100	50.9	50.9	10.6	36.7	7.9
CA-901-712	21	98.3	33.2	32.8	12	38.3	8.1
FA-900-720	27	46.7	11	5.3	18.9	6.7	2.2
CA-801-717	29	100	46.3	46.3	15	50	11.1
CA-801-748	29	100	62.4	62.4	12.5	56.7	15.2
MN99225	25	81.7	17.9	14.8	15.1	12.3	4.4
MN99408	24	83.3	22	18.5	16.7	13.3	5.2
MN00021	24	86.7	28.4	25.1	16.3	12.3	4
MN00173	22	90	23.2	21.1	15.6	15	6.4
MN00274	24	40	10.7	4.2	14.3	12.7	2.9
D011503	29	100	63.3	63.3	8.2	33.3	5.4
D011512	29	100	65.3	65.3	10.6	51.7	11.1
D011521	28	100	62.5	62.5	11.4	45	9.4
D011515	28	100	82.1	82.1	13.5	53.3	14.2
D011527	28	98.3	50.4	49.6	20.9	35	10.7
PI 168727	29	96.7	43.7	42.6	8.4	23.3	13.7
PI 345731	22	91.7	39.5	36.3	11.7	17.7	4.9
PI 163429	26	91.7	28	26	13.6	12.3	4.6
PI 264940	29	98.3	34.8	34.3	18.2	16.7	6.1
PI 185843	30	76.7	23.2	17.7	15.6	15	5.1
Mean	26	86.1	33.9	31.5	13.3	26.5	6.6
LSD (0.05)	1	16.8	14.9	15.2	3.4	17.1	
CV	2	12	27	29.8	15.9	39.8	

Table 5. 2002 Uniform Regional Scab Nursery for Spring Wheat Parents, Langdon, ND.

Line	50% Heading day*	Incidence %	Severity %	Disease %	Tombstone** %
2375	6	70	11.9	8.7	13
Wheaton	9	80	15.5	12.7	24.3
BacUp	4	56.7	9.8	5.5	7.7
Oslo	4	76.7	17.5	14.5	28
ND2710	6	23.3	2.4	0.5	3
ND3020	2	46.7	5.3	2.9	7
ND3078	6	63.3	5.2	2.9	5.7
ND3085	4	20	3.4	0.8	5
ND3088	8	46.7	4.9	2.3	5.7
ND3098	4	83.3	10.5	8.9	7.3
98B08*A59	7	40	5.6	2.5	6
98B08*B111	9	30	3.2	0.9	3.7
98B19*N22	6	53.3	6.9	3.7	12
98B19*S87	9	40	6.1	2.8	7.7
98B19*T99	8	46.7	9.1	4.2	12.7
SD3533	3	56.7	8.8	4.9	11.3
SD3686	3	46.7	6.5	3	4.7
SD3692	2	50	6.9	3.6	9.3
SD3696	6	60	6.5	4.2	7.3
SD3718	5	56.7	8.5	4.8	17.7
N99-0107	6	60	6.4	3.8	8.3
98S0146-01	6	63.3	7.4	4.6	5
98S0084-11	6	53.3	7	3.8	4.3
98S3015-01	7	46.7	7.5	5.1	12.3
98S0018-06	6	60	9.5	6	16.3
CA-901-712	1	80	17.7	14.9	9.3
FA-900-720	8	60	7.7	4.9	6
CA-801-717	9	76.7	16.3	13	11
CA-801-748	8	73.3	14.1	11.1	14.7
MN99225	7	33.3	4.2	1.4	5.7
MN99408	3	60	7.9	5.2	5.7
MN00021	4	36.7	3.6	1.5	4.3
MN00173	2	56.7	8.3	4.8	4.7
MN00274	4	23.3	3.2	0.7	9
D011503	8	63.3	7.5	4.7	8
D011512	9	70	15.1	11.1	10
D011521	8	53.3	7.2	4	12.7
D011515	9	56.7	5.6	3.2	10.3
D011527	7	40	3.8	1.6	6
PI 168727	6	40	4.4	1.8	8.7
PI 345731	1	16.7	1.1	0.3	8
PI 163429	5	30	4.2	1.3	4
PI 264940	8	50	8.3	4.1	9.3
PI 185843	10	53.3	7.7	4.5	6.3
Mean	6	52.3	7.7	4.8	9.1
LSD (0.05)	2	23	6.1	5.8	5.5
CV	24	27.1	48.4	74.5	37

FHB rated July 29, 10 heads on all plots

* 1=Jun27, 9=Jul 5

** Tombstone counts are on 100 seed samples

Table 6. 2002 Uniform Regional Scab Nursery for Spring Wheat Parents, Prosper, ND.

Line	Incidence %	Severity %	VSK %	DON ppm
2375	100	77.5	67.5	36.5
Wheaton	100	90.8	67.5	47.5
BacUp	100	45.7	45	27.4
Oslo	100	93.9	65	56.5
ND2710	99.3	29.7	39	25.8
ND3020	100	67.1	46	44.3
ND3078	100	58.5	45	30.6
ND3085	98.8	39.1	30	19.4
ND3088	100	50.2	42.5	34.9
ND3098	100	65.3	47.5	38.3
98B08*A59	100	73.7	40	31.6
98B08*B111	97.5	56.5	40	36.3
98B19*N22	100	60.2	41	31.9
98B19*S87	100	63.3	47.5	34
98B19*T99	100	79.1	42.5	41.6
SD3533	97.5	62.5	47.5	34.7
SD3686	100	61.5	62.5	44.9
SD3692	100	58.6	45	39.6
SD3696	100	63.0	45	23.8
SD3718	100	81.2	60	34
N99-0107	100	61.9	40	38.9
98S0146-01	100	48.9	38.5	31.8
98S0084-11	100	64.3	42.5	30.4
98S3015-01	100	86.8	40	38.4
98S0018-06	100	82.2	55	45.7
CA-901-712	100	80.8	67.5	31.5
FA-900-720	98.3	47.2	37.5	26.6
CA-801-717	100	62.2	50	38
CA-801-748	99.3	77.9	50	50.6
MN99225	99	57.9	40	28.6
MN99408	100	57.1	43.5	37.1
MN00021	100	53.7	40	35.3
MN00173	97.8	68.2	50	32.4
MN00274	96.3	34.2	30	13.8
D011503	100	84.8	40	27.9
D011512	100	88.0	52.5	37.6
D011521	100	85.2	47.5	43.6
D011515	100	91.1	57.5	50
D011527	100	79.0	45	39.6
PI 168727	100	76.3	43.5	48
PI 345731	100	75.2	57.5	39.1
PI 163429	100	78.6	50	47
PI 264940	100	71.1	44	40.2
PI 185843	100	73.9	40	27.8
Mean	99.6	67.4	46.5	36.9
LSD (0.05)	NS	14.5	13.8	18.2

Table 7. 2002 Uniform Regional Scab Nursery for Spring Wheat Parents, Brookings, SD.

Line	Incidence %	Severity %	Disease %	Yield (g/plot)	Tombstone Rating
2375	100	51.8	51.8	28.1	40
Wheaton	100	60.5	60.5	23.2	65
BacUp	100	40.8	40.8	31	20
Oslo	100	69.9	69.9	11.2	65
ND2710	93.1	19.3	18	45.5	20
ND3020	100	32.5	32.5	45.2	15
ND3078	100	41.7	41.7	41.4	28.3
ND3085	100	50.7	50.7	29.6	13.3
ND3088	100	43.8	43.8	36.2	33.3
ND3098	100	49	49	33.2	21.7
98B08*A59	100	34.5	34.5	20.3	26.7
98B08*B111	100	42.7	42.7	27.3	30
98B19*N22	100	50.9	50.9	32.6	31.7
98B19*S87	100	53	53	24.9	46.7
98B19*T99	100	43.5	43.5	26	33.3
SD3533	100	53.7	53.7	42	16.7
SD3686	100	45.5	45.5	45.7	23.3
SD3692	100	32	32	42.1	25
SD3696	100	42.2	42.2	32.5	6.7
SD3718	100	58.7	58.7	25.7	42.5
N99-0107	100	35.8	35.8	33.5	15
98S0146-01	100	37.5	37.5	31.4	13.3
98S0084-11	100	46	46	22.2	18.3
98S3015-01	100	46.8	46.8	17.2	31.7
98S0018-06	100	54.8	54.8	35.1	38.3
CA-901-712	--	--	--	--	--
FA-900-720	100	32.5	32.5	32.5	30
CA-801-717	100	56.8	56.8	8.8	60.8
CA-801-748	100	52.1	52.1	17.6	55
MN99225	100	35.8	35.8	20.4	21.7
MN99408	100	33.5	33.5	45.9	18.3
MN00021	100	34	34	39.6	20
MN00173	100	56.8	56.8	53.4	21.7
MN00274	100	41.5	41.5	23.6	36.7
D011503	100	54.8	54.8	8.8	56.7
D011512	100	60.5	60.5	6	55
D011521	100	51.4	51.4	4.6	55
D011515	100	61.2	61.2	11.6	63.3
D011527	100	56.9	56.9	22.5	68.3
PI 168727	100	54.4	54.4	11.3	26.7
PI 345731	100	53.5	53.5	18.3	10
PI 163429	100	62.5	62.5	19.7	30
PI 264940	100	39.7	39.7	29.7	28.3
PI 185843	100	42.5	42.5	34.5	15
Mean	99.8	46.9	46.9	27.7	32.4
LSD (0.05)	4	4.1	4.1	5.5	28.5
CV	2.4	3.4	3.4	7.8	33.3

Table 8. 2002 URSN for Spring Wheat Parents Summary of Means Across Locations.

Line	Incidence	Severity	Disease	VSK	DON	Incidence	Severity	Disease	VSK	DON
	%	%	%	%	ppm	Rank	Rank	Rank	Rank	Rank
No. Locations	6	6	5	5	4	6	6	5	5	4
2375	87	47	36.3	30.6	15.6	35	35	34	33	32
Wheaton	94.4	63.4	55.7	52.7	20.5	43	43	43	44	41
BacUp	73.9	28	18.6	18.8	9.7	18	9	10	15	7
Oslo	93.6	66.1	57.9	48.9	22.2	42	44	44	43	44
ND2710	57.3	17.2	8.6	16.1	8.8	2	1	1	4	5
ND3020	75	35.3	22.6	22.1	17.5	21	18	18	24	37
ND3078	82.2	37.8	27.4	21.7	12.6	30	22	26	23	18
ND3085	63.3	25.8	17.8	13.3	8.2	5	5	9	1	4
ND3088	77.2	29	20.5	22.2	12.1	25	11	14	26	15
ND3098	85.2	37.5	27.9	22.2	15.2	33	21	27	26	31
98B08*A59	71.1	37.1	22.2	17.7	10.5	13	19	17	11	9
98B08*B111	60	30.1	16.3	18.3	11.4	3	12	7	13	11
98B19*N22	71.6	35.3	24.7	21.3	12.3	16	18	22	20	16
98B19*S87	78.3	38.9	29.2	27.2	13.6	26	26	28	30	22
98B19*T99	73.8	40.1	24.8	23.6	14.6	17	28	23	28	27
SD3533	75.9	39.1	30.2	27.8	15	23	27	30	31	28
SD3686	75.3	33.2	21.9	23.4	14.6	22	15	16	27	27
SD3692	74.8	27.2	16.7	25.2	15.1	20	7	8	29	30
SD3696	60.1	28.8	14.4	14.1	7.6	4	10	4	3	2
SD3718	89.3	51.2	41.5	33.8	14.3	40	39	39	37	25
N99-0107	85.6	34.5	25.3	18.3	15.7	34	16	24	13	33
98S0146-01	69.3	24.6	14.9	13.5	10.6	11	4	5	2	10
98S0084-11	76.2	30.6	19.8	16.2	13.6	24	13	12	5	22
98S3015-01	85.2	45.4	33.4	20.5	14.3	33	33	32	19	25
98S0018-06	84.4	49.7	38.2	31.7	17.7	31	36	36	34	38
CA-901-712	96.4	51.5	43.3	32.7	13.6	44	40	40	36	22
FA-900-720	64.8	22	11.8	17.2	8.1	7	3	3	9	3
CA-801-717	80.9	43.3	34.2	36.4	16.4	28	30	33	40	36
CA-801-748	87.9	52.9	43.8	37.7	21.2	37	41	41	41	43
MN99225	70.1	32.7	21	16.7	10.4	12	14	15	8	8
MN99408	74.1	26.4	15.4	17.4	12.5	19	6	6	10	17
MN00021	71.6	27.6	18.7	16.5	11.5	16	8	11	7	13
MN00173	67.8	37.9	24.2	19.5	12	8	23	20	16	14
MN00274	53.3	20.5	11.7	18.5	5.3	1	2	2	14	1
D011503	87.6	50	39.1	29.6	11.5	36	37	37	32	13
D011512	91.3	50.4	40.5	35.8	16.2	41	38	38	39	35
D011521	88.7	46.5	36.5	34	17.8	39	34	35	38	39
D011515	88	55.9	45.7	40.9	21.2	38	42	42	42	43
D011527	78.7	44.6	31.8	32.5	16.1	27	32	31	35	34
PI 168727	71.3	44.3	29.6	21.6	18.1	14	31	29	21	40
PI 345731	64.5	38.8	23.1	20.2	12.8	6	25	19	17	19
PI 163429	69	43	26.4	20.5	15.1	9	29	25	19	30
PI 264940	81.4	37.3	24.5	21.7	13.4	29	20	21	23	20
PI 185843	69.2	38	20.5	16.5	9.2	10	24	14	7	6
Mean	76.7	38.6	27.5	24.7	13.8					
LSD (0.05)	15.2	11.5	13.5	10.6	5.5					

Table 9. Percent Incidence and Rank by Location in the 2002 URSN for Spring Wheat Parents.

Line	Percent Incidence by Location*							Rank by Location*						
	6 Loc.	Gle.	Cro.	St.P.	Lan.	Pro.	Bro.	6 Loc.	Gle.	Cro.	St.P.	Lan.	Pro.	Bro.
2375	87	83.8	80	88.3	70	100	100	35	40	36	19	38	27	23
Wheaton	94.4	86.3	100	100	80	100	100	43	42	42	40	43	27	23
BacUp	73.9	60	60	66.7	56.7	100	100	18	13	26	6	26	27	23
Oslo	93.6	95	90	100	76.7	100	100	42	44	39	40	41	27	23
ND2710	57.3	50	20	58.3	23.3	99.3	93.1	2	6	5	5	4	9	1
ND3020	75	71.3	40	91.7	46.7	100	100	21	25	19	23	15	27	23
ND3078	82.2	71.3	75	83.3	63.3	100	100	30	25	33	14	35	27	23
ND3085	63.3	47.5	30	83.3	20	98.8	100	5	5	12	14	2	6	23
ND3088	77.2	66.3	55	95	46.7	100	100	25	18	24	26	15	27	23
ND3098	85.2	61.3	70	96.7	83.3	100	100	33	15	30	29	44	27	23
98B08*A59	71.1	76.3	25	85	40	100	100	13	29	8	17	11	27	23
98B08*B111	60	47.5	10	75	30	97.5	100	3	5	2	8	6	3	23
98B19*N22	71.6	81.3	20	75	53.3	100	100	16	35	5	8	22	27	23
98B19*S87	78.3	60	70	100	40	100	100	26	13	30	40	11	27	23
98B19*T99	73.8	71.3	40	85	46.7	100	100	17	25	19	17	15	27	23
SD3533	75.9	81.3	25	95	56.7	97.5	100	23	35	8	26	26	3	23
SD3686	75.3	70	45	90	46.7	100	100	22	22	21	21	15	27	23
SD3692	74.8	68.8	50	80	50	100	100	20	21	23	11	19	27	23
SD3696	60.1	43.8	15	41.7	60	100	100	4	3	3	2	31	27	23
SD3718	89.3	82.5	100	96.7	56.7	100	100	40	38	42	29	26	27	23
N99-0107	85.6	83.8	75	95	60	100	100	34	40	33	26	31	27	23
98S0146-01	69.3	67.5	30	55	63.3	100	100	11	19	12	4	35	27	23
98S0084-11	76.2	68.8	60	75	53.3	100	100	24	21	26	8	22	27	23
98S3015-01	85.2	86.3	80	98.3	46.7	100	100	33	42	36	33	15	27	23
98S0018-06	84.4	81.3	65	100	60	100	100	31	35	28	40	31	27	23
CA-901-712	96.4	80	100	98.3	80	100	--	44	32	42	33	43	27	--
FA-900-720	64.8	53.8	30	46.7	60	98.3	100	7	9	12	3	31	5	23
CA-801-717	80.9	73.8	35	100	76.7	100	100	28	27	16	40	41	27	23
CA-801-748	87.9	90	65	100	73.3	99.3	100	37	43	28	40	39	9	23
MN99225	70.1	71.3	35	81.7	33.3	99	100	12	25	16	12	7	7	23
MN99408	74.1	51.3	50	83.3	60	100	100	19	7	23	14	31	27	23
MN00021	71.6	76.3	30	86.7	36.7	100	100	16	29	12	18	8	27	23
MN00173	67.8	57.5	5	90	56.7	97.8	100	8	11	1	21	26	4	23
MN00274	53.3	40	20	40	23.3	96.3	100	1	2	5	1	4	1	23
D011503	87.6	82.5	80	100	63.3	100	100	36	38	36	40	35	27	23
D011512	91.3	77.5	100	100	70	100	100	41	30	42	40	38	27	23
D011521	88.7	78.8	100	100	53.3	100	100	39	31	42	40	22	27	23
D011515	88	81.3	90	100	56.7	100	100	38	35	39	40	26	27	23
D011527	78.7	63.8	70	98.3	40	100	100	27	16	30	33	11	27	23
PI 168727	71.3	66.3	25	96.7	40	100	100	14	18	8	29	11	27	23
PI 345731	64.5	38.8	40	91.7	16.7	100	100	6	1	19	23	1	27	23
PI 163429	69	52.5	40	91.7	30	100	100	9	8	19	23	6	27	23
PI 264940	81.4	60	80	98.3	50	100	100	29	13	36	33	19	27	23
PI 185843	69.2	55	30	76.7	53.3	100	100	10	10	12	10	22	27	23
Mean	76.7	68.5	53.5	86.1	52.3	99.6	99.8							
LSD (0.05)	15.2	21.6	--	16.8	23	NS	4							

* 6 Loc: Mean of 6 locations; Gle.: Glenlea; Cro.: Crookston; St.P.: St. Paul; Lan.: Langdon; Pro.: Prosper; Bro.: Brookings

Table 10. Percent Severity and Rank by Location in the 2002 URSN for Spring Wheat Parents.

Line	Percent Severity by Location							Rank by Location						
	6 Loc.	Gle.	Cro.	St.P.	Lan.	Pro.	Bro.	6 Loc.	Gle.	Cro.	St.P.	Lan.	Pro.	Bro.
2375	47	76.3	30.3	34.3	11.9	77.5	51.8	35	40	36	27	38	30	27
Wheaton	63.4	73.8	65.8	73.7	15.5	90.8	60.5	43	39	44	43	41	42	40
BacUp	28	33.8	13.3	24.5	9.8	45.7	40.8	9	9	18	17	36	4	12
Oslo	66.1	91.3	59	65	17.5	93.9	69.9	44	44	43	41	43	44	43
ND2710	17.2	30	8.5	13.2	2.4	29.7	19.3	1	6	7	5	2	1	1
ND3020	35.3	67.5	15.8	23.3	5.3	67.1	32.5	18	33	22	15	13	23	4
ND3078	37.8	68.8	28.1	24.4	5.2	58.5	41.7	22	35	34	16	12	12	14
ND3085	25.8	23.8	9.3	28.2	3.4	39.1	50.7	5	2	10	24	5	3	24
ND3088	29	33.8	13.2	28	4.9	50.2	43.8	11	9	17	23	11	7	19
ND3098	37.5	50	12.3	38	10.5	65.3	49	21	18	15	30	37	22	23
98B08*A59	37.1	70	21.6	17.1	5.6	73.7	34.5	19	37	30	7	15	26	7
98B08*B111	30.1	52.5	11	14.8	3.2	56.5	42.7	12	19	13	6	4	9	17
98B19*N22	35.3	67.5	8.5	17.6	6.9	60.2	50.9	18	33	7	8	21	14	25
98B19*S87	38.9	57.5	12.3	41.4	6.1	63.3	53	26	22	15	32	16	20	29
98B19*T99	40.1	67.5	15.8	25.7	9.1	79.1	43.5	28	33	22	19	34	34	18
SD3533	39.1	66.3	6	37.4	8.8	62.5	53.7	27	30	2	29	33	18	31
SD3686	33.2	42.5	15.9	27.2	6.5	61.5	45.5	15	15	24	21	19	15	20
SD3692	27.2	32.5	8	25	6.9	58.6	32	7	7	5	18	21	13	2
SD3696	28.8	37.5	12.7	11.1	6.5	63	42.2	10	11	16	3	19	19	15
SD3718	51.2	80	35.2	43.6	8.5	81.2	58.7	39	42	40	33	32	36	38
N99-0107	34.5	61.3	19.1	22.7	6.4	61.9	35.8	16	25	27	12	17	16	9
98S0146-01	24.6	35	7.7	11.2	7.4	48.9	37.5	4	10	4	4	24	6	10
98S0084-11	30.6	30	17.4	19	7	64.3	46	13	6	26	10	22	21	21
98S3015-01	45.4	80	25.4	26	7.5	86.8	46.8	33	42	31	20	26	40	22
98S0018-06	49.7	72.5	28.4	50.9	9.5	82.2	54.8	36	38	35	37	35	37	34
CA-901-712	51.5	65	52.3	33.2	17.7	80.8	--	40	28	42	26	44	35	--
FA-900-720	22	22.5	10.8	11	7.7	47.2	32.5	3	1	12	2	28	5	4
CA-801-717	43.3	61.3	17.1	46.3	16.3	62.2	56.8	30	25	25	35	42	17	36
CA-801-748	52.9	83.8	27	62.4	14.1	77.9	52.1	41	43	32	38	39	31	28
MN99225	32.7	66.3	14.3	17.9	4.2	57.9	35.8	14	30	19	9	9	11	9
MN99408	26.4	28.8	9	22	7.9	57.1	33.5	6	4	9	11	29	10	5
MN00021	27.6	40	6	28.4	3.6	53.7	34	8	13	2	25	6	8	6
MN00173	37.9	65	6	23.2	8.3	68.2	56.8	23	28	2	14	31	24	36
MN00274	20.5	25	8.5	10.7	3.2	34.2	41.5	2	3	7	1	4	2	13
DO11503	50	45	44.5	63.3	7.5	84.8	54.8	37	16	41	40	26	38	34
DO11512	50.4	38.8	34.4	65.3	15.1	88	60.5	38	12	39	42	40	41	40
DO11521	46.5	41.3	31.4	62.5	7.2	85.2	51.4	34	14	37	39	23	39	26
DO11515	55.9	61.3	34.2	82.1	5.6	91.1	61.2	42	25	38	44	15	43	41
DO11527	44.6	56.3	21.4	50.4	3.8	79	56.9	32	21	29	36	7	33	37
PI 168727	44.3	67.5	19.6	43.7	4.4	76.3	54.4	31	33	28	34	10	29	32
PI 345731	38.8	47.5	15.8	39.5	1.1	75.2	53.5	25	17	22	31	1	28	30
PI 163429	43	70	14.5	28	4.2	78.6	62.5	29	37	20	23	9	32	42
PI 264940	37.3	60	9.7	34.8	8.3	71.1	39.7	20	23	11	28	31	25	11
PI 185843	38	53.8	27.2	23.2	7.7	73.9	42.5	24	20	33	14	28	27	16
Mean	38.6	54.5	20.6	33.9	7.7	67.4	46.9							
LSD (0.05)	11.5	20.5	--	14.9	6.1	14.5	4.1							

Table 11. Percent Disease and Rank by Location in the 2002 URSN for Spring Wheat Parents.

Line	Percent Disease by Location						Rank by Location					
	5 Loc.	Gle.	Cro.	St.P.	Lan.	Bro.	5 Loc.	Gle.	Cro.	St.P.	Lan.	Bro.
2375	36.3	64.1	24.2	32.7	8.7	51.8	34	39	36	26	37	27
Wheaton	55.7	65.6	65.8	73.7	12.7	60.5	43	40	44	43	41	40
BacUp	18.6	20.6	8	18	5.5	40.8	10	8	25	12	35	12
Oslo	57.9	86.8	53.1	65	14.5	69.9	44	44	43	41	43	43
ND2710	8.6	15.3	1.7	7.4	0.5	18	1	4	5	5	2	1
ND3020	22.6	50.4	6.3	21.1	2.9	32.5	18	30	20	17	15	4
ND3078	27.4	50.6	21.1	20.7	2.9	41.7	26	31	35	15	15	14
ND3085	17.8	11.5	2.8	23.1	0.8	50.7	9	2	10	20	4	24
ND3088	20.5	22.5	7.3	26.8	2.3	43.8	14	9	23	25	11	19
ND3098	27.9	36	8.6	37.1	8.9	49	27	19	28	31	38	23
98B08*A59	22.2	53.8	5.4	14.6	2.5	34.5	17	35	16	8	12	7
98B08*B111	16.3	25.8	1.1	11	0.9	42.7	7	13	2	6	5	17
98B19*N22	24.7	53.9	1.7	13.4	3.7	50.9	22	36	5	7	19	25
98B19*S87	29.2	40.2	8.6	41.4	2.8	53	28	25	28	32	13	29
98B19*T99	24.8	47.4	6.3	22.5	4.2	43.5	23	27	20	19	25	18
SD3533	30.2	55.5	1.5	35.2	4.9	53.7	30	37	3	29	32	31
SD3686	21.9	29.5	7.2	24.5	3	45.5	16	14	22	21	16	20
SD3692	16.7	23.8	4	20.2	3.6	32	8	11	12	14	18	2
SD3696	14.4	19	1.9	4.8	4.2	42.2	4	7	8	2	25	15
SD3718	41.5	66.6	35.2	42	4.8	58.7	39	41	40	33	30	38
N99-0107	25.3	50.9	14.3	21.7	3.8	35.8	24	32	30	18	21	9
98S0146-01	14.9	24	2.3	6.1	4.6	37.5	5	12	9	4	27	10
98S0084-11	19.8	22.8	10.4	15.9	3.8	46	12	10	29	10	21	21
98S3015-01	33.4	69.1	20.3	25.5	5.1	46.8	32	42	34	23	33	22
98S0018-06	38.2	60.8	18.5	50.9	6	54.8	36	38	33	37	36	34
CA-901-712	43.3	53.5	52.3	32.8	14.9	--	40	34	42	27	44	--
FA-900-720	11.8	13	3.2	5.3	4.9	32.5	3	3	11	3	32	4
CA-801-717	34.2	48.8	6	46.3	13	56.8	33	29	18	35	42	36
CA-801-748	43.8	76	17.6	62.4	11.1	52.1	41	43	32	38	40	28
MN99225	21	47.9	5	14.8	1.4	35.8	15	28	15	9	7	9
MN99408	15.4	15.5	4.5	18.5	5.2	33.5	6	5	13	13	34	5
MN00021	18.7	30.9	1.8	25.1	1.5	34	11	16	7	22	8	6
MN00173	24.2	38	0.3	21.1	4.8	56.8	20	24	1	17	30	36
MN00274	11.7	10.6	1.7	4.2	0.7	41.5	2	1	5	1	3	13
D011503	39.1	37	35.6	63.3	4.7	54.8	37	23	41	40	28	34
D011512	40.5	31	34.4	65.3	11.1	60.5	38	17	39	42	40	40
D011521	36.5	33.1	31.4	62.5	4	51.4	35	18	38	39	22	26
D011515	45.7	51	30.8	82.1	3.2	61.2	42	33	37	44	17	41
D011527	31.8	36.1	15	49.6	1.6	56.9	31	20	31	36	9	37
PI 168727	29.6	44.5	4.9	42.6	1.8	54.4	29	26	14	34	10	32
PI 345731	23.1	19	6.3	36.3	0.3	53.5	19	7	20	30	1	30
PI 163429	26.4	36.5	5.8	26	1.3	62.5	25	21	17	24	6	42
PI 264940	24.5	36.6	7.8	34.3	4.1	39.7	21	22	24	28	23	11
PI 185843	20.5	29.8	8.2	17.7	4.5	42.5	14	15	26	11	26	16
Mean	27.5	39.9	13.9	31.5	4.8	46.9						
LSD (0.05)	13.5	21.5	--	15.2	5.8	4.1						

Table 12. Percent VSK and Rank by Location in the 2002 URSN for Spring Wheat Parents.

Line	Percent VSK by Location						Rank by Location					
	5 Loc.	Cro.	St.P.	Lan.	Pro.	Bro.	5 Loc.	Cro.	St.P.	Lan.	Pro.	Bro.
2375	30.6	15	17.3	13	67.5	40	33	41	19	39	43	32
Wheaton	52.7	40	66.7	24.3	67.5	65	44	44	44	43	43	42
BacUp	18.8	4	17.3	7.7	45	20	15	8	19	22	23	12
Oslo	48.9	20	66.7	28	65	65	43	43	44	44	41	42
ND2710	16.1	2	16.3	3	39	20	4	2	16	1	5	12
ND3020	22.1	4	38.3	7	46	15	24	8	36	18	26	6
ND3078	21.7	6	23.3	5.7	45	28.3	23	18	26	12	23	22
ND3085	13.3	4	14	5	30	13.3	1	8	12	9	2	4
ND3088	22.2	8	21.7	5.7	42.5	33.3	26	27	24	12	16	29
ND3098	22.2	8	26.7	7.3	47.5	21.7	26	27	28	20	29	15
98B08*A59	17.7	2	14	6	40	26.7	11	2	12	15	10	20
98B08*B111	18.3	4	14	3.7	40	30	13	8	12	2	10	24
98B19*N22	21.3	4	18	12	41	31.7	20	8	21	35	14	27
98B19*S87	27.2	6	28.3	7.7	47.5	46.7	30	18	29	22	29	34
98B19*T99	23.6	6	23.3	12.7	42.5	33.3	28	18	26	38	16	29
SD3533	27.8	10	53.3	11.3	47.5	16.7	31	34	41	34	29	8
SD3686	23.4	8	18.3	4.7	62.5	23.3	27	27	22	7	40	17
SD3692	25.2	10	36.7	9.3	45	25	29	34	33	29	23	18
SD3696	14.1	4	7.3	7.3	45	6.7	3	8	3	20	23	1
SD3718	33.8	12	36.7	17.7	60	42.5	37	39	33	42	39	33
N99-0107	18.3	8	20	8.3	40	15	13	27	23	25	10	6
98S0146-01	13.5	4	6.7	5	38.5	13.3	2	8	2	9	4	4
98S0084-11	16.2	4	11.7	4.3	42.5	18.3	5	8	5	5	16	10
98S3015-01	20.5	8	10.3	12.3	40	31.7	19	27	4	36	10	27
98S0018-06	31.7	12	36.7	16.3	55	38.3	34	39	33	41	36	31
CA-901-712	32.7	8	38.3	9.3	67.5	--	36	27	36	29	43	--
FA-900-720	17.2	6	6.7	6	37.5	30	9	18	2	15	3	24
CA-801-717	36.4	10	50	11	50	60.8	40	34	38	33	33	39
CA-801-748	37.7	12	56.7	14.7	50	55	41	39	42	40	33	36
MN99225	16.7	4	12.3	5.7	40	21.7	8	8	7	12	10	15
MN99408	17.4	6	13.3	5.7	43.5	18.3	10	18	10	12	19	10
MN00021	16.5	6	12.3	4.3	40	20	7	18	7	5	10	12
MN00173	19.5	6	15	4.7	50	21.7	16	18	15	7	33	15
MN00274	18.5	4	12.7	9	30	36.7	14	8	9	27	2	30
D011503	29.6	10	33.3	8	40	56.7	32	34	30	24	10	38
D011512	35.8	10	51.7	10	52.5	55	39	34	39	31	35	36
D011521	34	10	45	12.7	47.5	55	38	34	37	38	29	36
D011515	40.9	20	53.3	10.3	57.5	63.3	42	43	41	32	38	40
D011527	32.5	8	35	6	45	68.3	35	27	31	15	23	43
PI 168727	21.6	6	23.3	8.7	43.5	26.7	21	18	26	26	19	20
PI 345731	20.2	8	17.7	8	57.5	10	17	27	20	24	38	2
PI 163429	20.5	6	12.3	4	50	30	19	18	7	3	33	24
PI 264940	21.7	10	16.7	9.3	44	28.3	23	34	17	29	20	22
PI 185843	16.5	6	15	6.3	40	15	7	18	15	17	10	6
Mean	24.7	8	26.5	9.1	46.5	32.4						
LSD (0.05)	10.6	--	17.1	5.5	13.8	28.5						

Table 13. DON and Rank by Location in the 2002 URSN for Spring Wheat Parents.

Line	ppm DON by Location					Rank by Location				
	4 Loc.	Gle.	Cro.	St.P.	Pro.	4 Loc.	Gle.	Cro.	St.P.	Pro.
2375	15.6	15.3	5.7	4.7	36.5	32	42	41	16	23
Wheaton	20.5	13.9	10.6	9.9	47.5	41	40	44	36	40
BacUp	9.7	5	2.2	4.1	27.4	7	11	14	8	6
Oslo	22.2	17.2	5	10	56.5	44	44	38	37	44
ND2710	8.8	3.8	0.8	4.7	25.8	5	7	2	16	4
ND3020	17.5	9.5	4.6	11.5	44.3	37	27	32	41	36
ND3078	12.6	8.1	4.7	7.1	30.6	18	21	35	30	11
ND3085	8.2	7.4	1.3	4.8	19.4	4	19	6	17	2
ND3088	12.1	6	1.8	5.8	34.9	15	14	11	25	20
ND3098	15.2	8.2	4.7	9.7	38.3	31	22	35	35	27
98B08*A59	10.5	4.7	1.6	3.9	31.6	9	8	8	6	13
98B08*B111	11.4	3.5	1.3	4.6	36.3	11	5	6	14	22
98B19*N22	12.3	10.9	2.9	3.5	31.9	16	29	20	5	15
98B19*S87	13.6	12.2	3.2	4.9	34	22	33	22	19	18
98B19*T99	14.6	8.5	3.9	4.3	41.6	27	24	25	10	34
SD3533	15	12.8	4.6	7.8	34.7	28	37	32	31	19
SD3686	14.6	5.6	3.4	4.5	44.9	27	12	24	12	37
SD3692	15.1	9.2	4.5	7.1	39.6	30	26	30	30	32
SD3696	7.6	2.5	1.7	2.5	23.8	2	3	9	3	3
SD3718	14.3	12.7	4.7	5.8	34	25	36	35	25	18
N99-0107	15.7	12.3	4.5	6.9	38.9	33	34	30	28	29
98S0146-01	10.6	6.3	2.5	1.9	31.8	10	15	18	1	14
98S0084-11	13.6	15.8	2.4	5.7	30.4	22	43	16	23	10
98S3015-01	14.3	10.5	4.1	4.2	38.4	25	28	27	9	28
98S0018-06	17.7	13.1	4.1	7.9	45.7	38	38	27	32	38
CA-901-712	13.6	11.7	3	8.1	31.5	22	32	21	33	12
FA-900-720	8.1	2.3	1.1	2.2	26.6	3	1	3	2	5
CA-801-717	16.4	11.1	5.2	11.1	38	36	31	39	40	26
CA-801-748	21.2	12.4	6.4	15.2	50.6	43	35	43	44	43
MN99225	10.4	7.1	1.6	4.4	28.6	8	18	8	11	9
MN99408	12.5	5.9	1.9	5.2	37.1	17	13	12	21	24
MN00021	11.5	4.9	1.8	4	35.3	13	10	11	7	21
MN00173	12	6.9	2.4	6.4	32.4	14	17	16	27	16
MN00274	5.3	3.5	0.8	2.9	13.8	1	5	2	4	1
D011503	11.5	8.4	4.1	5.4	27.9	13	23	27	22	8
D011512	16.2	11.1	4.9	11.1	37.6	35	31	37	40	25
D011521	17.8	13.5	4.7	9.4	43.6	39	39	35	34	35
D011515	21.2	14.2	6.3	14.2	50	43	41	42	43	42
D011527	16.1	8.7	5.3	10.7	39.6	34	25	40	38	32
PI 168727	18.1	7.9	2.8	13.7	48	40	20	19	42	41
PI 345731	12.8	4.9	2.4	4.9	39.1	19	10	16	19	30
PI 163429	15.1	6.6	2.2	4.6	47	30	16	14	14	39
PI 264940	13.4	3.7	3.4	6.1	40.2	20	6	24	26	33
PI 185843	9.2	2.5	1.2	5.1	27.8	6	3	4	20	7
Mean	5.5	8.7	3.5	6.6	36.9					
LSD (0.05)		6.2	--	--	18.2					