2014

NORTH AMERICAN BARLEY SCAB EVALUATION NURSERY (NABSEN) REPORT

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INTRODUCTION

The 2014 North American Barley Scab Evaluation Nursery (NABSEN) was grown at Fargo, Langdon, and Casselton, ND; St. Paul and Crookston MN, and Brandon, Manitoba. Nurseries were either misted or unmisted (dryland). Dryland nurseries provide conditions similar to those found in commercial fields. Disease in misted fields was more severe than growers would observe in most years and entries with only moderate FHB resistance may have higher disease levels. Dryland nurseries allow discrimination of entries with moderate to low levels of FHB resistance. Each nursery included a set of common checks. The checks were Chevron, Quest and ND 20493(resistant six-row checks), Robust and Stander (susceptible six-row checks), and Conlon (resistant two-row check). At all locations percent severity of FHB was determined around the middle dough stage by determining the ratio of infected kernels to total kernels on 10-20 spikes per entry, and then multiplying by 100.

RESULTS

The Brandon, Manitoba location was lost due to severe flooding. Disease levels in 2014 were low at Crookston, Casselton and Osnabrock unmisted nurseries thus no FHB incidence or severity data were taken from these nurseries. FHB disease levels were low at Fargo, Langdon and St. Paul misted locations; while Crookston had moderate FHB severity. DON levels were high at Langdon, ND (table.4) and Fargo, Crookston and St. Paul had moderate levels. Osnabrock dry land had low DON levels. Temperatures were close to average for the 30 year average (table. 6), for May at all locations. Prosper was below the 30 year average for June, while St. Paul and Crookston were above, the rest of the locations were near average. All locations were below the 30 year average for July and St. Paul and Crookston were above the average for August. Precipitation was below the 30 year average in May, July and August for most locations and above in June except Langdon which was average (Table.7).

Site details are as follows:

Fargo, & Langdon ND – Robert Brueggeman and Patrick Gross

- Misted
- Inoculated by grain spawn method
- 3 Replicates
- Disease severity - percentage of infected kernels
- Disease incidence - percentage of infected heads
- DON content (ppm) measured by GC/ECD by P. Schwarz, NDSU on a composite sample of 3 replicates
- Day to heading counted from date planted to 50% of heads emerged 50%

Osnabrock, ND – Richard Horsley

- Dryland
- 3 Replicates
- Disease severity – none taken
- Disease incidence – none taken
- DON content (ppm) measured by GC/ECD by P. Schwarz, NDSU on a composite sample of 3 replicates

Casselton, ND – Jolanta Menert

- Dryland
- 3 replicates
- Disease severity – none taken
- Disease incidence – none taken
- DON content (ppm) measured by GC/ECD by P. Schwarz, NDSU on a composite sample of 3 replicates

ST. PAUL & CROOKSTON, MN– Kevin Smith and Ruth Dill-Macky

- Misted (Crookston and St. paul) and dryland (2nd location at Crookston)
- Inoculated by grain spawn method
- Disease severity - percentage of infected kernels
- DON content (ppm) measured by GC/ECD by P. Schwarz, NDSU on a composite sample of 3 replicates
- Day to heading counted from date planted to 50% of heads emerged 50%
- No data for Crookston dryland

BRANDON, MANITOBA - Bill Legge and James Tucker

- No data field flooded

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Table 1. Mean FHB severity of entries grown in the 2014 NABSEN Nursery at four locations.

Line	Fargo	Langdon	Crookston misted	St. Paul	Average
ND28554	6.2	3.5	22.5	9.5	**10.4**
ND28555	5.8	3.2	22.8	7.5	**9.8**
ND29196	5.7	2.1	8.8	13.2	**7.5**
ND29380	15.8	3.4	18.2	8.8	**11.6**
ND30159	13.5	4.0	18.5	8.3	**11.1**
ND30304	11.5	3.8	29.7	17.8	**15.7**
ND30320	8.8	3.7	17.2	6.9	**9.1**
ND30377	6.6	1.5	28.3	3.9	**10.1**
2ND27705	4.0	6.7	7.0	8.8	**6.6**
2ND28065	5.4	3.9	8.2	15.5	**8.2**
2ND30639	5.5	6.1	19.3	16.5	**11.9**
2ND30672	12.9	3.9	18.0	14.8	**12.4**
2ND30724	5.4	3.9	12.0	12.2	**8.4**
2ND30749	9.0	7.5	9.8	10.7	**9.2**
2ND30837	8.3	5.7	10.3	6.3	**7.7**
2ND30879	11.8	6.8	14.3	14.5	**11.9**
M159	9.9	1.2	12.8	2.5	**6.6**
M160	11.4	3.4	10.8	3.9	**7.4**
M161	7.6	2.2	13.8	6.4	**7.5**
M162	14.8	2.6	12.3	8.0	**9.4**
MS11S3058-012	9.2	2.5	11.0	7.5	**7.6**
MS11S3090-011	10.0	0.8	19.0	8.6	**9.6**
MS11S3091-010	6.3	2.3	17.0	7.4	**8.2**
MW11S4033-008	9.6	1.9	37.7	12.7	**15.5**
2B12-5585	6.8	4.3	17.2	19.3	**11.9**
2B12-5607	7.0	4.7	12.5	17.2	**10.3**

Table 1. cont: Mean FHB severity of entries grown in the 2014 NABSEN Nursery at four locations.

Line	Fargo	Langdon	Crookston misted	St. Paul	Average
2B12-5678	6.6	6.7	18.7	19.2	**12.8**
2B12-5680	7.4	3.8	19.3	18.3	**12.2**
2B12-5765	10.3	7.9	13.7	17.0	**12.2**
2B12-5766	5.8	5.3	13.3	11.7	**9.0**
2B12-5770	8.2	6.7	24.2	23.2	**15.6**
2B12-5960	7.8	6.8	21.5	9.0	**11.3**
TR14237	5.1	3.6	7.2	8.0	**6.0**
TR14240	6.5	3.8	22.3	14.2	**11.7**
HB 132	6.6	5.8	7.7	16.3	**9.1**
BM0728-290	10.0	3.2	20.0	10.5	**10.9**
SM090487	5.5	3.6	6.5	11.7	**6.8**
SB090740	7.2	6.8	10.5	16.2	**10.2**
SM090209	5.9	7.2	20.2	9.8	**10.8**
SM090534	5.0	11.7	9.5	10.2	**9.1**
HB 624	7.2	7.3	13.0	19.5	**11.8**
HB 625	4.1	3.5	13.3	12.5	**8.3**
HB 626	6.8	4.4	7.8	9.7	**7.2**
TR14615	4.1	5.5	10.2	9.7	**7.4**
QUEST	4.8	1.2	11.3	3.1	**5.1**
Conlon	6.2	8.9	33.8	7.7	**14.2**
ND 20493	5.3	2.4	25.2	1.0	**8.5**
Robust	12.8	4.9	28.8	15.3	**15.5**
Chevron	1.5	2.3	12.8	6.1	**5.7**
Stander	6.6	4.1	16.0	24.5	**12.8**

Table 2. Mean disease incidence of entries grown in the 2014 NABSEN Nursery at two locations.

Line	Fargo	Langdon	Average
ND28554	86.7	56.7	**71.7**
ND28555	86.7	60.0	**73.3**
ND29196	73.3	40.0	**56.7**
ND29380	100.0	76.7	**88.3**
ND30159	86.7	73.3	**80.0**
ND30304	93.3	70.0	**81.7**
ND30320	86.7	76.7	**81.7**
ND30377	80.0	40.0	**60.0**
2ND27705	46.7	56.7	**51.7**
2ND28065	66.7	40.0	**53.3**
2ND30639	53.3	63.3	**58.3**
2ND30672	93.3	43.3	**68.3**
2ND30724	70.0	33.3	**51.7**
2ND30749	73.3	63.3	**68.3**
2ND30837	73.3	60.0	**66.7**
2ND30879	96.7	70.0	**83.3**
M159	86.7	33.3	**60.0**
M160	83.3	56.7	**70.0**
M161	83.3	60.0	**71.7**
M162	96.7	63.3	**80.0**
MS11S3058-012	93.3	46.7	**70.0**
MS11S3090-011	86.7	23.3	**55.0**
MS11S3091-010	86.7	53.3	**70.0**
MW11S4033-008	93.3	40.0	**66.7**
2B12-5585	86.7	56.7	**71.7**
2B12-5607	90.0	60.0	**75.0**

Table 2. cont: Mean disease incidence of entries grown in the 2014 NABSEN Nursery at two locations.

Line	Fargo	Langdon	Average
2B12-5678	76.7	70.0	**73.3**
2B12-5680	76.7	53.3	**65.0**
2B12-5765	86.7	76.7	**81.7**
2B12-5766	80.0	66.7	**73.3**
2B12-5770	93.3	70.0	**81.7**
2B12-5960	80.0	70.0	**75.0**
TR14237	60.0	46.7	**53.3**
TR14240	50.0	46.7	**48.3**
HB 132	70.0	70.0	**70.0**
BM0728-290	93.3	76.7	**85.0**
SM090487	73.3	46.7	**60.0**
SB090740	80.0	56.7	**68.3**
SM090209	76.7	80.0	**78.3**
SM090534	70.0	86.7	**78.3**
HB 624	73.3	63.3	**68.3**
HB 625	60.0	50.0	**55.0**
HB 626	70.0	50.0	**60.0**
TR14615	60.0	60.0	**60.0**
QUEST	63.3	46.7	**55.0**
Conlon	63.3	66.7	**65.0**
ND 20493	83.3	60.0	**71.7**
Robust	93.3	50.0	**71.7**
Chevron	50.0	53.3	**51.7**
Stander	73.3	73.3	**73.3**

Table 3. Mean days to heading after planting of entries grown in 2014 NABSEN Nursery at four locations.

			Crookston		
Line	Fargo	Langdon	misted	St. Paul	Average
ND28554	52	52	49.0	50.0	**51**
ND28555	54	52	48.7	50.7	**51**
ND29196	53	53	52.7	51.7	**53**
ND29380	52	51	52.7	51.7	**52**
ND30159	53	52	52.3	52.7	**52**
ND30304	53	52	49.3	50.7	**51**
ND30320	53	51	50.3	49.3	**51**
ND30377	52	51	48.0	49.7	**50**
2ND27705	53	52	53.3	53.0	**53**
2ND28065	36	52	53.0	50.0	**48**
2ND30639	53	53	52.0	50.0	**52**
2ND30672	53	52	52.0	51.0	**52**
2ND30724	53	52	52.3	49.7	**52**
2ND30749	53	52	54.3	51.0	**53**
2ND30837	53	52	54.0	53.3	**53**
2ND30879	51	53	50.0	51.0	**51**
M159	50	51	49.0	49.3	**50**
M160	52	50	52.3	49.0	**51**
M161	51	50	48.7	49.7	**50**
M162	52	50	50.3	51.0	**51**
MS11S3058-012	52	52	53.3	51.0	**52**
MS11S3090-011	51	50	50.0	49.0	**50**
MS11S3091-010	52	51	51.7	51.3	**51**
MW11S4033-008	48	50	48.0	50.0	**49**
2B12-5585	53	51	53.7	52.0	**53**
2B12-5607	52	52	55.0	51.0	**52**

Table 3. cont: Mean days to heading after planting of entries grown in 2014 NABSEN Nursery at four locations.

			Crookston		
Line	Fargo	Langdon	misted	St. Paul	Average
2B12-5678	52	51	53.3	51.7	**52**
2B12-5680	52	52	55.0	51.3	**53**
2B12-5765	53	52	53.3	51.0	**52**
2B12-5766	51	52	54.0	51.7	**52**
2B12-5770	52	52	52.3	50.3	**52**
2B12-5960	52	52	53.0	54.3	**53**
TR14237	55	53	55.3	54.3	**54**
TR14240	53	51	52.0	51.3	**52**
HB 132	52	50	54.3	51.3	**52**
BM0728-290	51	51	51.0	50.3	**51**
SM090487	54	52	56.3	52.0	**54**
SB090740	53	51	53.0	51.0	**52**
SM090209	54	52	54.0	54.3	**54**
SM090534	53	51	54.7	53.7	**53**
HB 624	52	51	53.3	52.0	**52**
HB 625	53	51	55.7	55.3	**54**
HB 626	53	51	57.0	54.3	**54**
TR14615	53	52	56.0	53.3	**54**
QUEST	52	51	49.0	48.7	**50**
Conlon	47	49	47.0	48.3	**48**
ND 20493	50	50	48.0	48.0	**49**
Robust	53	52	48.0	49.3	**51**
Chevron	56	54	56.3	55.3	**56**
Stander	54	53	49.3	51.0	**52**

Table 4. Mean for DON (ppm) entries grown in 2014 NABSEN Nursery at six locations.

					Misted	Dryland		**Dryland**
Name	Fargo	Langdon	Crookston	St. Paul	**Average**	Casselton	Osnabrock	**Average**
ND28554	7.7	31.4	7.7	7.9	**13.7**	0.5	1.3	**0.9**
ND28555	12.2	32.8	11.0	9.0	**16.2**	1.2	1.0	**1.1**
ND29196	13.1	59.7	10.1	7.6	**22.6**	3.0	2.8	**2.9**
ND29380	14.1	39.7	17.2	11.2	**20.6**	4.7	0.6	**2.7**
ND30159	11.2	29.9	14.1	14.0	**17.3**	1.7	1.0	**1.4**
ND30304	19.7	39.9	9.8	12.1	**20.4**	2.1	1.1	**1.6**
ND30320	7.1	36.3	3.9	2.6	**12.5**	1.5	0.7	**1.1**
ND30377	12.0	25.1	8.3	10.9	**14.1**	1.3	0.9	**1.1**
2ND27705	2.4	71.7	4.4	1.2	**19.9**	0.2	0.7	**0.5**
2ND28065	2.6	19.4	5.3	1.9	**7.3**	0.4	0.5	**0.4**
2ND30639	8.7	36.8	19.4	2.6	**16.8**	0.4	2.2	**1.3**
2ND30672	2.6	29.6	7.0	4.8	**11.0**	1.2	0.3	**0.8**
2ND30724	7.3	29.2	8.3	3.4	**12.0**	0.9	2.7	**1.8**
2ND30749	6.9	33.9	6.1	3.2	**12.5**	1.0	1.6	**1.3**
2ND30837	6.6	30.4	20.0	3.6	**15.1**	1.1	0.4	**0.7**
2ND30879	9.4	24.0	8.4	5.3	**11.8**	1.0	0.2	**0.6**
M159	7.5	21.2	2.4	3.1	**8.5**	0.4	1.3	**0.8**
M160	9.6	34.6	9.9	4.5	**14.6**	0.3	0.5	**0.4**
M161	4.3	19.7	2.6	5.5	**8.0**	0.9	0.5	**0.7**
M162	4.8	25.8	4.4	4.9	**10.0**	0.5	0.6	**0.6**
MS11S3058-012	6.3	28.2	11.8	5.1	**12.9**	0.3	0.7	**0.5**
MS11S3090-011	6.2	22.5	11.4	4.0	**11.0**	1.9	0.2	**1.1**
MS11S3091-010	7.9	28.9	6.0	2.9	**11.4**	1.9	1.1	**1.5**
MW11S4033-008	3.5	11.4	7.2	3.3	**6.4**	1.8	0.4	**1.1**
2B12-5585	11.8	37.7	13.0	3.4	**16.5**	0.7	0.4	**0.5**
2B12-5607	5.0	41.1	11.1	6.7	**16.0**	0.9	0.6	**0.8**

Table 4. cont: Mean for DON (ppm) entries grown in 2014 NABSEN Nursery at six locations.

					Misted	Dryland		**Dryland**
Name	Fargo	Langdon	Crookston	St. Paul	**Average**	Casselton	Osnabrock	**Average**
2B12-5678	10.2	30.2	nd*	7.4	**16.0**	0.5	0.2	**0.3**
2B12-5680	5.9	38.0	19.3	1.9	**16.3**	1.5	0.4	**1.0**
2B12-5765	7.4	44.2	nd	1.7	**17.8**	1.3	0.3	**0.8**
2B12-5766	11.8	35.0	5.1	1.8	**13.4**	0.8	0.3	**0.6**
2B12-5770	10.2	31.3	11.8	1.8	**13.8**	1.0	0.8	**0.9**
2B12-5960	7.3	34.4	12.2	8.1	**15.5**	0.9	1.4	**1.2**
TR14237	8.4	34.8	nd	1.2	**14.8**	0.9	0.7	**0.8**
TR14240	6.3	17.0	3.2	1.8	**7.1**	0.2	0.2	**0.2**
HB 132	3.1	10.8	3.3	1.4	**4.7**	0.3	0.5	**0.4**
BM0728-290	4.9	26.6	5.7	6.8	**11.0**	1.6	0.8	**1.2**
SM090487	4.1	22.2	0.8	0.4	**6.9**	0.4	0.2	**0.3**
SB090740	8.7	18.5	3.2	1.2	**7.9**	0.9	0.9	**0.9**
SM090209	6.2	24.2	nd	0.5	**10.3**	0.5	0.2	**0.4**
SM090534	8.5	37.2	8.2	0.7	**13.6**	0.5	1.0	**0.8**
HB 624	2.7	10.6	2.2	1.6	**4.3**	0.4	0.2	**0.3**
HB 625	3.4	7.1	1.8	0.3	**3.1**	0.6	0.3	**0.4**
HB 626	4.3	13.8	2.3	1.1	**5.4**	0.5	0.3	**0.4**
TR14615	8.7	16.8	6.8	2.2	**8.6**	0.5	1.6	**1.1**
QUEST	4.5	25.0	1.9	1.6	**8.2**	0.3	0.4	**0.3**
Conlon	7.2	20.0	nd	1.1	**9.4**	0.5	0.2	**0.3**
ND 20493	8.3	15.1	3.6	1.0	**7.0**	0.5	0.2	**0.3**
Robust	15.9	42.9	10.0	7.4	**19.0**	0.3	1.3	**0.8**
Chevron	10.8	31.2	nd	0.4	**14.1**	1.4	0.3	**0.8**
Stander	15.8	48.7	9.5	15.4	**22.3**	2.2	3.8	**3.0**

*nd= no data

Table 5. Average means of Heading date, FHB Incidence, FHB severity and DON content.

Line	Days to [1] heading	FHB[2] incidence	FHB[3] severity	DON ppm[4] misted	DON ppm[4] dryland
ND28554	50.8	71.7	10.4	13.7	0.5
ND28555	51.3	73.3	9.8	16.2	1.2
ND29196	52.7	56.7	7.5	22.6	3.0
ND29380	51.8	88.3	11.6	20.6	4.7
ND30159	52.4	80.0	11.1	17.3	1.7
ND30304	51.3	81.7	15.7	20.4	2.1
ND30320	50.9	81.7	9.1	12.5	1.5
ND30377	50.0	60.0	10.1	14.1	1.3
2ND27705	52.8	51.7	6.6	19.9	0.2
2ND28065	47.8	53.3	8.2	7.3	0.4
2ND30639	51.8	58.3	11.9	16.8	0.4
2ND30672	51.8	68.3	12.4	11.0	1.2
2ND30724	51.6	51.7	8.4	12.0	0.9
2ND30749	52.6	68.3	9.2	12.5	1.0
2ND30837	53.1	66.7	7.7	15.1	1.1
2ND30879	51.3	83.3	11.9	11.8	1.0
M159	49.8	60.0	6.6	8.5	0.4
M160	50.8	70.0	7.4	14.6	0.3
M161	50.0	71.7	7.5	8.0	0.9
M162	50.8	80.0	9.4	10.0	0.5
MS11S3058-012	52.0	70.0	7.6	12.9	0.3
MS11S3090-011	50.0	55.0	9.6	11.0	1.9
MS11S3091-010	51.4	70.0	8.2	11.4	1.9
MW11S4033-008	49.1	66.7	15.5	6.4	1.8
2B12-5585	52.6	71.7	11.9	16.5	0.7
2B12-5607	52.4	75.0	10.3	16.0	0.9

[1]Date from planting to 50% of heads 50% emerged at four locations.
[2] FHB incidence means at two locations.
[3] FHB severity means at four locations.
[4] DON content means at four locations for misted and two for dryland.

Table 5. cont: Average means of Heading date, FHB Incidence, FHB severity and DON content.

	Days to [1]	FHB[2]	FHB[3]	DON ppm[4]	DON ppm[4]
Line	heading	incidence	severity	misted	dryland
2B12-5678	52.0	73.3	12.8	16.0	0.5
2B12-5680	52.7	65.0	12.2	16.3	1.5
2B12-5765	52.2	81.7	12.2	17.8	1.3
2B12-5766	52.2	73.3	9.0	13.4	0.8
2B12-5770	51.5	81.7	15.6	13.8	1.0
2B12-5960	53.0	75.0	11.3	15.5	0.9
TR14237	54.3	53.3	6.0	14.8	0.9
TR14240	51.8	48.3	11.7	7.1	0.2
HB 132	51.9	70.0	9.1	4.7	0.3
BM0728-290	50.9	85.0	10.9	11.0	1.6
SM090487	53.7	60.0	6.8	6.9	0.4
SB090740	52.0	68.3	10.2	7.9	0.9
SM090209	53.6	78.3	10.8	10.3	0.5
SM090534	53.1	78.3	9.1	13.6	0.5
HB 624	52.0	68.3	11.8	4.3	0.4
HB 625	53.8	55.0	8.3	3.1	0.6
HB 626	53.8	60.0	7.2	5.4	0.5
TR14615	53.6	60.0	7.4	8.6	0.5
QUEST	50.2	55.0	5.1	8.2	0.3
Conlon	47.8	65.0	14.2	9.4	0.5
ND 20493	49.0	71.7	8.5	7.0	0.5
Robust	50.7	71.7	15.5	19.0	0.3
Chevron	55.5	51.7	5.7	14.1	1.4
Stander	51.8	73.3	12.8	22.3	2.2

[1] Date from planting to 50% of heads 50% emerged at four locations.
[2] FHB incidence means at two locations.
[3] FHB severity means at four locations.
[4] DON content means at four locations for misted and two for dryland.

Table 6. Temperature (ºF) compared to the 30-year average.

Location	May	June	July	August
Fargo, ND	0	1	-2	1
Langdon, ND	0	0	-2	0
Prosper, ND*	1	-2	-1	0
St. Paul, MN	-.9	2.5	-.5	2.3
Crookston, MN	0	1.8	-2.1	0.5

*Prosper is closest recording NDAWN weather station to Casselton, ND

Table 7. Rainfall (in.) compared to the 30-year average.

Location	May	June	July	August
Fargo, ND	0.85	1.62	-1.5	-1.1
Langdon, ND	-0.85	0	-1.3	1.0
Prosper, ND*	-1.0	0.25	-2.2	-0.2
St. Paul, MN	-.18	4.72	-1.67	-.77
Crookston, MN	-1	2.08	-.83	-1.37

*Prosper is closest recording NDAWN weather station to Casselton, ND

Table 8. Correlation among locations for DON content.

	Misted				Dryland	
Location	Fargo	Langdon	Crookston	St. Paul	Casselton	Osnabrock
Fargo	1.0	0.29	0.42	0.52	0.47	0.43
Langdon	0.29	1.0	0.36	0.30	0.15	0.17
Crookston	0.42	0.36	1.0	0.42	0.47	0.34
St. Paul	0.52	0.30	0.42	1.0	0.44	0.19
Casselton	0.47	0.15	0.47	0.44	1.0	0.40
Osnabrock	0.43	0.17	0.34	0.19	0.40	1.0

*,** r-values significantly different from 0.0 at $P<0.05$ and $P<0.01$, respectively

Table 9. Pedigree and source of breeding lines tested for FHB resistance in 2014

Entry	Name	Pedigree	Origin	Row type
1	ND28554	ND23497/ND22421	North Dakota State University	6-row
2	ND28555	ND23497/ND22421	North Dakota State University	6-row
3	ND29196	ND20299/ND21786	North Dakota State University	6-row
4	ND29380	ND25025/ND21843	North Dakota State University	6-row
5	ND30159	Quest/ND25152	North Dakota State University	6-row
6	ND30304	Quest/ND25165	North Dakota State University	6-row
7	ND30320	Quest/ND25165	North Dakota State University	6-row
8	ND30377	Quest/ND25165	North Dakota State University	6-row
9	2ND27705	2ND24393/TR05285	North Dakota State University	2-row
10	2ND28065	2ND21867/2ND24383	North Dakota State University	2-row
11	2ND30639	2ND25253/Posada	North Dakota State University	2-row
12	2ND30672	2ND25265/2ND26328	North Dakota State University	2-row
13	2ND30724	2ND25265/2ND26328	North Dakota State University	2-row
14	2ND30749	2ND25625/2ND26333	North Dakota State University	2-row
15	2ND30837	2ND25265/Grace	North Dakota State University	2-row
16	2ND30879	2ND25270/2ND25275	North Dakota State University	2-row
17	M159	Quest / FEG183-52	University of Minnesota	6-row
18	M160	M139 / FEG160-03	University of Minnesota	6-row
19	M161	FEG183-52 / M135	University of Minnesota	6-row
20	M162	Quest / M140	University of Minnesota	6-row
21	MS11S3058-012	MS10S4034-018 / MS10S4029-013	University of Minnesota	6-row
22	MS11S3090-011	MS10S4063-013 / MS10S4014-016	University of Minnesota	6-row
23	MS11S3091-010	MS10S4063-013 / MS10S4036-002	University of Minnesota	6-row
24	MW11S4033-008	S47/E//S47-40 // OR72 / FEG183-28	University of Minnesota	2-row
25	2B12-5585	2B05-0728/2B06-0929	BAR - LLC	2-row
26	2B12-5607	2B05-0813/2B06-0929	BAR - LLC	2-row
27	2B12-5678	2B06-1144//2B06-0929/2B06-1144	BAR - LLC	2-row

Table 9. cont: Pedigree and source of breeding lines tested for FHB resistance in 2014

Entry	Name	Pedigree	Origin	Row type
28	2B12-5680	2B06-1144//2B06-0929/2B06-1144	BAR - LLC	2-row
29	2B12-5765	2B05-0829/2B06-0929//2B05-0829/2B06-1144	BAR - LLC	2-row
30	2B12-5766	2B05-0829/2B06-0929//2B05-0829/2B06-1144	BAR - LLC	2-row
31	2B12-5770	2B05-0829/2B06-0929//2B05-0829/2B06-1144	BAR - LLC	2-row
32	2B12-5960	Z005T026U/VOYAGER	BAR - LLC	2-row
33	TR14237	Cerveza/TR06293	Agriculture and Agri-Food Canada (Legge)	2-row
34	TR14240	TR05285/BM9845-6	Agriculture and Agri-Food Canada (Legge)	2-row
35	HB 132	HB808/2/ALAMO/CHUANLUO-2/3/MILLHOUSE	Agriculture and Agri-Food Canada (Badea)	2-row
36	BM0728-290	Azul/Legacy//Legacy	Agriculture and Agri-Food Canada (Badea)	6-row
37	SM090487	TR02185/TR05286	Crop Development Centre -University of SK	2-row
38	SB090740	CDC Austenson/CDC Meredith	Crop Development Centre -University of SK	2-row
39	SM090209	SM04756/Norman	Crop Development Centre -University of SK	2-row
40	SM090534	TR05286/SM04450	Crop Development Centre -University of SK	2-row
41	HB 624	CDC FREEDOM/ H98068	Field Crop Development Centre - ARD	2-row
42	HB 625	TERCEL/H93003006Z	Field Crop Development Centre - ARD	2-row
43	HB 626	CDC MCGWIRE/CDC FREEDOM	Field Crop Development Centre - ARD	2-row
44	TR14615	H92017203Z/H93123023	Field Crop Development Centre - ARD	2-row
45	QUEST	FEG18-20 / M110		6-row
46	Conlon	BOWMAN*2/DWS1008/ND10232		2-row
47	ND 20493	ND16918*2/CIho 6611		6-row
48	Robust	MOREX/MANKER		6-row
49	Chevron	UNKNOWN		6-row
50	Stander	ROBUST*2/3/CREE/BONANZA//MANKER/4/ROBUST/BUMBER		6-row