2015

NORTH AMERICAN BARLEY SCAB EVALUATION NURSERY (NABSEN) REPORT

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INTRODUCTION

The 2015 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 trials 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

Disease levels in 2015 were low early in the season at Casselton, Osnabrock and Crookston unmisted nurseries thus no FHB incidence or severity data were taken from these nurseries. FHB disease severity levels were moderate at St. Paul, Crookston and Brandon misted locations; while Fargo and Langdon locations were moderately high. DON levels were highest at Fargo, Langdon, Brandon, and Crookston, while St. Paul was the lowest of the misted trials (table.4). The dry land nurseries Osnabrock and Casselton were considered moderate high. These levels on the dry land nurseries were the highest seen over the past few years.

Temperatures were below the 30 year average (table. 6), for May at all locations except Langdon which was average. June temperatures were generally average to above average except for Crookston which was below the 30 year average. All locations were above the 30 year average for July except Langdon and St. Paul. Fargo, Langdon and Casselton had average temperatures in August, while St. Paul and Crookston were below and Brandon was above the 30 year average.

Precipitation was above the 30 year average in May in all locations except Crookston. In June all locations were close to average except Fargo and Brandon which were below the 30 year average. Crookston was above the 30 year average and Brandon was below, while the other locations were close to average in July. In August all locations were below the 30 year average for precipitation except St. Paul (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 incidence or severity – 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 incidence or severity – 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

- Misted
- 4 replicates RCB design
- Disease severity - percentage of infected kernels
- Disease incidence - percentage of infected heads
- Day to heading counted from date planted to 80% of heads emerged 50%
- DON content (ppm) measured by ELISA technique at ECORC, Ottawa on a composite sample of 4 replicates

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Table 1. Mean FHB severity of entries grown in the 2015 NABSEN Nursery at five locations.

Line	Fargo	Langdon	Brandon	Crookston	St. Paul	**Mean**
ND29196	42.1	26.3	14.0	26.5	13.9	**24.6**
ND29380	49.9	39.6	11.4	12.0	5.1	**23.6**
ND30304	52.7	31.6	7.2	19.8	1.2	**22.5**
ND30320	46.0	43.0	7.9	23.8	1.6	**24.5**
ND30377	35.3	27.1	6.3	22.6	1.2	**18.5**
ND31091	34.6	24.8	4.9	11.1	2.7	**15.6**
ND31040	36.7	20.6	2.9	10.5	1.2	**14.4**
ND31721	56.9	29.7	8.7	18.9	1.4	**23.1**
2ND30639	25.4	19.7	7.2	23.8	4.7	**16.2**
2ND30724	38.1	17.5	8.5	13.2	3.0	**16.1**
2ND30749	29.5	14.1	13.1	11.3	3.8	**14.4**
2ND30837	31.5	18.7	11.5	18.7	8.0	**17.7**
2ND30879	32.7	22.2	9.2	16.7	4.7	**17.1**
2ND31815	22.6	12.8	6.9	14.3	1.9	**11.7**
2ND31914	39.9	22.5	9.4	10.8	3.5	**17.2**
2ND32184	27.1	17.7	10.0	19.2	12.5	**17.3**
04/506/42/8	24.3	21.4	13.8	20.7	10.2	**18.1**
M159	26.7	16.1	4.5	10.6	1.6	**11.9**
M161	41.1	29.7	4.6	15.7	1.3	**18.5**
M162	35.5	29.8	6.6	11.3	1.2	**16.9**
S6M163	42.8	27.9	11.1	23.8	6.8	**22.5**
S6M164	24.5	19.0	4.8	11.1	1.7	**12.2**
S6M165	35.2	19.3	5.0	15.5	2.2	**15.4**
S6M166	34.7	27.3	8.9	13.4	3.2	**17.5**
S6M167	33.5	21.0	6.5	14.5	3.1	**15.7**
2B12-5417	31.8	23.6	19.9	8.8	13.3	**19.5**

Table 1. cont: Mean FHB severity of entries grown in the 2015 NABSEN Nursery at five locations.

Line	Fargo	Langdon	Brandon	Crookston	St. Paul	**Mean**
2B12-5459	34.7	30.7	18.0	15.8	6.0	**21.0**
2B12-5496	24.8	29.0	15.4	13.3	9.8	**18.5**
2B12-5582	25.6	33.8	13.5	no data	11.5	**21.1**
2B12-5593	26.7	20.4	9.0	12.2	6.8	**15.0**
2B12-5643	26.9	20.8	17.4	17.5	5.2	**17.6**
2B12-5651	19.3	31.1	9.2	29.5	9.0	**19.6**
2B12-5656	28.1	22.3	11.5	31.5	10.0	**20.7**
TR15242	20.4	10.6	3.4	10.5	11.0	**11.2**
TR15246	28.7	20.1	4.2	11.0	5.8	**14.0**
TR15247	41.9	24.3	8.2	10.0	10.3	**18.9**
BM0728-039	39.2	26.5	4.9	26.2	2.9	**19.9**
SM132104	23.9	13.7	2.6	8.8	4.5	**10.7**
SM130675	18.1	14.5	7.2	8.0	8.5	**11.3**
SM132139	20.7	26.4	6.0	15.0	12.7	**16.2**
SM130161	37.2	14.0	4.5	14.2	5.0	**15.0**
HB 627	11.4	12.7	7.7	10.3	8.0	**10.0**
HB 628	16.8	11.6	3.2	15.0	2.8	**9.9**
SR15504	30.6	39.2	16.9	30.0	6.7	**24.7**
TR15619	21.4	16.4	5.4	4.0	4.8	**10.4**
QUEST	24.6	23.5	5.2	12.0	1.1	**13.3**
Conlon	29.6	22.5	1.7	19.2	5.2	**15.6**
ND20493	30.8	26.6	4.0	21.3	3.7	**17.3**
Robust	49.6	32.5	5.6	15.9	1.1	**21.0**
Chevron	10.4	13.6	2.4	16.8	5.9	**9.8**
Stander	44.4	27.4	20.4	19.8	10.2	**24.5**

Table 2. Mean disease incidence of entries grown in the 2015 NABSEN Nursery at three locations.

Line	Fargo	Langdon	Brandon	**Mean**
ND29196	100.0	100.0	92.5	**97.5**
ND29380	100.0	100.0	82.5	**94.2**
ND30304	100.0	100.0	85.0	**95.0**
ND30320	100.0	100.0	85.0	**95.0**
ND30377	100.0	100.0	72.5	**90.8**
ND31091	100.0	100.0	77.5	**92.5**
ND31040	100.0	100.0	65.0	**88.3**
ND31721	100.0	100.0	67.5	**89.2**
2ND30639	100.0	100.0	80.0	**93.3**
2ND30724	100.0	100.0	80.0	**93.3**
2ND30749	90.0	90.0	87.5	**89.2**
2ND30837	96.7	100.0	90.0	**95.6**
2ND30879	100.0	100.0	90.0	**96.7**
2ND31815	100.0	96.7	72.5	**89.7**
2ND31914	96.7	96.7	90.0	**94.4**
2ND32184	93.3	100.0	90.0	**94.4**
04/506/42/8	96.7	100.0	90.0	**95.6**
M159	100.0	93.3	67.5	**86.9**
M161	100.0	100.0	75.0	**91.7**
M162	100.0	100.0	80.0	**93.3**
S6M163	100.0	100.0	90.0	**96.7**
S6M164	96.7	100.0	47.5	**81.4**
S6M165	100.0	100.0	67.5	**89.2**
S6M166	100.0	100.0	85.0	**95.0**
S6M167	100.0	100.0	65.0	**88.3**
2B12-5417	100.0	100.0	92.5	**97.5**

Table 2. cont: Mean disease incidence of entries grown in the 2015 NABSEN Nursery at three locations.

Line	Fargo	Langdon	Brandon	**Mean**
2B12-5459	100.0	100.0	95.0	**98.3**
2B12-5496	96.7	100.0	95.0	**97.2**
2B12-5582	96.7	100.0	92.5	**96.4**
2B12-5593	100.0	96.7	90.0	**95.6**
2B12-5643	100.0	100.0	92.5	**97.5**
2B12-5651	100.0	100.0	87.5	**95.8**
2B12-5656	100.0	100.0	92.5	**97.5**
TR15242	86.7	83.3	57.5	**75.8**
TR15246	96.7	93.3	57.5	**82.5**
TR15247	100.0	100.0	75.0	**91.7**
BM0728-039	100.0	100.0	70.0	**90.0**
SM132104	96.7	93.3	50.0	**80.0**
SM130675	96.7	90.0	75.0	**87.2**
SM132139	100.0	96.7	72.5	**89.7**
SM130161	100.0	96.7	62.5	**86.4**
HB 627	93.3	96.7	67.5	**85.8**
HB 628	93.3	90.0	45.0	**76.1**
SR15504	100.0	100.0	95.0	**98.3**
TR15619	93.3	93.3	55.0	**80.6**
QUEST	100.0	100.0	67.5	**89.2**
Conlon	100.0	96.7	32.5	**76.4**
ND20493	100.0	86.7	52.5	**79.7**
Robust	100.0	100.0	80.0	**93.3**
Chevron	100.0	100.0	45.0	**81.7**
Stander	100.0	100.0	100.0	**100.0**

Table 3. Mean days to heading after planting of entries grown in 2015 NABSEN Nursery at five locations.

Line	Fargo	Langdon	Brandon*	Crookston	St. Paul	**Mean**
ND29196	58.7	55.0	53.0	58.0	56.0	**56.1**
ND29380	58.0	54.7	47.5	56.3	53.7	**54.0**
ND30304	57.3	55.3	46.5	55.7	52.7	**53.5**
ND30320	57.0	54.0	46.8	56.0	53.0	**53.4**
ND30377	56.3	54.0	48.0	55.0	52.3	**53.1**
ND31091	57.0	55.0	47.0	55.3	53.0	**53.5**
ND31040	57.7	54.7	46.0	55.7	52.3	**53.3**
ND31721	56.0	54.7	48.0	56.7	52.5	**53.6**
2ND30639	55.0	54.0	45.3	56.3	52.7	**52.7**
2ND30724	57.7	53.7	48.3	57.0	52.0	**53.7**
2ND30749	58.3	53.7	51.3	57.3	53.3	**54.8**
2ND30837	58.3	54.0	49.8	58.3	55.5	**55.2**
2ND30879	57.3	53.7	46.0	57.0	53.3	**53.5**
2ND31815	56.7	54.0	44.3	55.0	51.5	**52.3**
2ND31914	57.7	53.0	47.0	56.3	53.0	**53.4**
2ND32184	59.0	54.7	53.3	58.7	55.7	**56.3**
04/506/42/8	59.7	55.7	47.3	59.0	56.0	**55.5**
M159	57.7	55.3	50.0	57.3	52.3	**54.5**
M161	57.3	55.0	51.3	57.3	55.0	**55.2**
M162	57.3	54.3	46.5	56.7	53.3	**53.6**
S6M163	59.3	57.3	51.3	58.7	57.0	**56.7**
S6M164	57.3	55.7	49.5	57.3	52.7	**54.5**
S6M165	58.0	57.0	52.8	58.0	54.7	**56.1**
S6M166	57.3	56.3	51.8	57.7	53.0	**55.2**
S6M167	57.3	56.0	52.5	57.7	55.0	**55.7**
2B12-5417	57.7	56.7	47.3	59.0	56.3	**55.4**

* Day to heading counted from date planted to 80% of heads emerged 50%; at other locations 50% heads emerged 50%

Table 3. cont: Mean days to heading after planting of entries grown in 2015 NABSEN Nursery at five locations.

Line	Fargo	Langdon	Brandon*	Crookston	St. Paul	**Mean**
2B12-5459	58.3	56.3	49.8	58.7	53.5	**55.3**
2B12-5496	59.3	55.7	49.5	58.7	54.3	**55.5**
2B12-5582	59.3	55.7	47.5	no data	54.7	**54.3**
2B12-5593	59.0	56.7	47.8	58.0	55.0	**55.3**
2B12-5643	58.7	56.3	49.8	58.0	55.0	**55.6**
2B12-5651	59.7	55.3	47.3	58.3	53.3	**54.8**
2B12-5656	58.3	55.7	50.8	59.0	55.0	**55.8**
TR15242	60.3	57.7	52.0	58.7	56.3	**57.0**
TR15246	58.7	58.0	53.8	60.3	57.0	**57.6**
TR15247	59.3	57.7	52.0	59.0	56.3	**56.9**
BM0728-039	58.3	56.0	48.8	56.7	53.0	**54.6**
SM132104	60.0	57.3	54.0	60.3	56.5	**57.6**
SM130675	59.3	57.0	54.3	60.7	56.7	**57.6**
SM132139	59.7	56.3	53.5	59.0	56.0	**56.9**
SM130161	59.0	57.0	52.0	59.0	56.0	**56.6**
HB 627	60.3	56.7	52.0	59.0	57.0	**57.0**
HB 628	60.7	57.0	53.5	59.0	56.0	**57.2**
SR15504	59.0	56.0	51.8	61.3	54.7	**56.6**
TR15619	61.7	59.0	55.0	63.0	58.0	**59.3**
QUEST	57.7	54.0	50.0	56.7	54.0	**54.5**
Conlon	53.7	51.7	42.0	55.3	48.7	**50.3**
ND20493	56.3	54.7	47.5	54.7	52.3	**53.1**
Robust	58.0	56.3	50.0	57.0	52.7	**54.8**
Chevron	62.7	60.0	53.0	62.0	58.0	**59.1**
Stander	59.0	56.7	53.8	58.0	54.0	**56.3**

* Day to heading counted from date planted to 80% of heads emerged 50%; other locations 50% heads emerged 50%

Table 4. Mean for DON (ppm) entries grown in 2015 NABSEN Nursery at seven locations.

	Misted					**Misted**	Dryland		**Dryland**
Line	Fargo	Langdon	Brandon	Crookston	St. Paul	**Mean**	Casselton	Osnabrock	**Mean**
ND29196	59.7	37.5	27.9	30.4	17.7	**34.6**	2.9	8.1	**5.5**
ND29380	65.6	37.8	26.0	37.2	19.9	**37.3**	3.2	11.4	**7.3**
ND30304	56.7	30.6	13.6	30.1	5.3	**27.3**	3.0	9.2	**6.1**
ND30320	45.8	21.7	16.8	19.1	3.4	**21.3**	4.1	8.4	**6.2**
ND30377	52.4	31.3	17.8	30.1	11.7	**28.7**	2.7	8.0	**5.4**
ND31091	45.7	14.5	16.7	16.2	10.5	**20.7**	3.1	4.9	**4.0**
ND31040	45.7	24.9	8.9	11.4	2.9	**18.8**	3.6	4.5	**4.0**
ND31721	51.0	41.7	22.4	28.1	13.7	**31.4**	4.1	8.1	**6.1**
2ND30639	69.0	23.2	16.2	25.7	5.5	**27.9**	3.1	3.5	**3.3**
2ND30724	45.2	15.8	16.0	24.2	15.5	**23.3**	1.8	4.8	**3.3**
2ND30749	40.9	12.0	15.8	23.6	7.5	**19.9**	3.7	4.0	**3.8**
2ND30837	66.9	19.0	14.4	15.8	15.5	**26.3**	4.9	4.6	**4.8**
2ND30879	47.4	11.0	11.4	13.6	16.1	**19.9**	4.8	5.2	**5.0**
2ND31815	30.4	15.7	8.0	28.6	16.3	**19.8**	2.7	2.2	**2.4**
2ND31914	47.6	11.9	13.7	10.4	14.9	**19.7**	2.2	4.2	**3.2**
2ND32184	31.0	11.0	9.8	16.0	9.4	**15.5**	4.8	4.8	**4.8**
04/506/42/8	66.0	15.2	15.0	13.5	8.4	**23.6**	1.6	4.1	**2.9**
M159	44.6	11.1	7.7	26.5	5.8	**19.1**	1.5	4.6	**3.0**
M161	38.4	23.8	17.4	32.6	6.5	**23.7**	1.5	3.2	**2.3**
M162	40.7	22.7	15.6	36.2	3.3	**23.7**	2.4	5.6	**4.0**
S6M163	35.4	34.8	23.0	42.0	7.1	**28.5**	1.9	5.4	**3.7**
S6M164	39.8	19.5	10.5	22.0	5.4	**19.4**	1.4	2.1	**1.8**
S6M165	39.5	14.7	14.2	23.7	9.1	**20.3**	1.9	3.6	**2.8**
S6M166	37.5	25.4	18.9	32.9	12.5	**25.4**	3.3	3.9	**3.6**
S6M167	43.0	22.4	19.4	34.0	14.3	**26.6**	1.7	7.1	**4.4**
2B12-5417	38.7	15.5	35.1	13.2	6.1	**21.7**	2.6	5.1	**3.8**

Table 4. cont: Mean for DON (ppm) entries grown in 2015 NABSEN Nursery at seven locations.

	Misted					**Misted**	Dryland		**Dryland**
Line	Fargo	Langdon	Brandon	Crookston	St. Paul	**Mean**	Casselton	Osnabrock	**Mean**
2B12-5459	39.9	16.6	24.3	11.2	18.8	**22.2**	1.8	3.9	**2.8**
2B12-5496	37.7	26.9	26.2	11.9	21.0	**24.8**	2.2	5.7	**3.9**
2B12-5582	38.3	15.7	18.0	no data	no data	**24.0**	2.1	3.0	**2.5**
2B12-5593	43.5	13.9	25.3	14.0	7.5	**20.9**	2.6	5.3	**3.9**
2B12-5643	52.1	17.3	27.0	11.5	10.8	**23.7**	2.3	5.1	**3.7**
2B12-5651	40.2	22.7	22.9	19.8	11.6	**23.4**	2.2	4.5	**3.4**
2B12-5656	51.9	26.2	22.0	44.8	15.9	**32.2**	1.5	3.8	**2.6**
TR15242	30.1	13.4	32.2	15.3	8.5	**19.9**	1.4	3.9	**2.7**
TR15246	26.5	8.8	15.8	5.4	4.3	**12.2**	2.1	3.3	**2.7**
TR15247	41.8	9.6	9.8	12.7	8.2	**16.4**	1.6	3.6	**2.6**
BM0728-039	29.8	22.2	16.6	36.9	15.6	**24.2**	2.1	3.6	**2.9**
SM132104	33.6	7.1	12.5	6.7	5.4	**13.1**	1.0	3.0	**2.0**
SM130675	28.0	6.0	10.7	13.9	5.0	**12.7**	1.3	2.2	**1.7**
SM132139	33.6	13.0	13.8	18.4	15.5	**18.9**	2.2	5.7	**3.9**
SM130161	35.1	9.2	14.5	18.6	4.8	**16.4**	1.9	3.8	**2.8**
HB 627	11.3	6.7	15.7	5.0	3.0	**8.3**	1.3	1.1	**1.2**
HB 628	15.9	5.8	9.0	12.2	2.6	**9.1**	1.4	0.8	**1.1**
SR15504	64.5	24.9	10.4	28.4	4.1	**26.4**	2.4	10.1	**6.2**
TR15619	14.1	4.6	26.5	5.8	13.7	**12.9**	0.4	2.1	**1.3**
QUEST	39.3	22.4	9.2	37.7	13.9	**24.5**	2.1	3.4	**2.8**
Conlon	51.0	14.6	15.4	10.7	5.3	**19.4**	1.7	3.9	**2.8**
ND20493	37.8	27.5	6.2	16.0	10.7	**19.6**	2.1	6.6	**4.4**
Robust	54.0	35.0	28.9	40.5	8.9	**33.5**	2.6	7.1	**4.8**
Chevron	16.4	16.9	19.2	23.3	9.9	**17.1**	1.8	2.6	**2.2**
Stander	64.5	30.9	41.9	38.9	28.5	**41.0**	9.6	7.5	**8.6**

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
ND29196	56.9	97.5	24.6	34.6	5.5
ND29380	55.7	94.2	23.6	37.3	7.3
ND30304	55.3	95.0	22.5	27.3	6.1
ND30320	55.0	95.0	24.5	21.3	6.2
ND30377	54.4	90.8	18.5	28.7	5.4
ND31091	55.1	92.5	15.6	20.7	4.0
ND31040	55.1	88.3	14.4	18.8	4.0
ND31721	55.0	89.2	23.1	31.4	6.1
2ND30639	54.5	93.3	16.2	27.9	3.3
2ND30724	55.1	93.3	16.1	23.3	3.3
2ND30749	55.7	89.2	14.4	19.9	3.8
2ND30837	56.5	95.6	17.7	26.3	4.8
2ND30879	55.3	96.7	17.1	19.9	5.0
2ND31815	54.3	89.7	11.7	19.8	2.4
2ND31914	55.0	94.4	17.2	19.7	3.2
2ND32184	57.0	94.4	17.3	15.5	4.8
04/506/42/8	57.6	95.6	18.1	23.6	2.9
M159	55.7	86.9	11.9	19.1	3.0
M161	56.2	91.7	18.5	23.7	2.3
M162	55.4	93.3	16.9	23.7	4.0
S6M163	58.1	96.7	22.5	28.5	3.7
S6M164	55.8	81.4	12.2	19.4	1.8
S6M165	56.9	89.2	15.4	20.3	2.8
S6M166	56.1	95.0	17.5	25.4	3.6
S6M167	56.5	88.3	15.7	26.6	4.4
2B12-5417	57.4	97.5	19.5	21.7	3.8

[1]Date from planting when 50% of heads 50% emerged at four locations, Brandon MB data not included.
[2] FHB incidence means at three locations.
[3] FHB severity means at five locations.
[4] DON content means at five locations for misted and two for dryland.

Table 5. cont: 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
2B12-5459	56.7	98.3	21.0	22.2	2.8
2B12-5496	57.0	97.2	18.5	24.8	3.9
2B12-5582	56.6	96.4	21.1	24.0	2.5
2B12-5593	57.2	95.6	15.0	20.9	3.9
2B12-5643	57.0	97.5	17.6	23.7	3.7
2B12-5651	56.7	95.8	19.6	23.4	3.4
2B12-5656	57.0	97.5	20.7	32.2	2.6
TR15242	58.3	75.8	11.2	19.9	2.7
TR15246	58.5	82.5	14.0	12.2	2.7
TR15247	58.1	91.7	18.9	16.4	2.6
BM0728-039	56.0	90.0	19.9	24.2	2.9
SM132104	58.5	80.0	10.7	13.1	2.0
SM130675	58.4	87.2	11.3	12.7	1.7
SM132139	57.8	89.7	16.2	18.9	3.9
SM130161	57.8	86.4	15.0	16.4	2.8
HB 627	58.3	85.8	10.0	8.3	1.2
HB 628	58.2	76.1	9.9	9.1	1.1
SR15504	57.8	98.3	24.7	26.4	6.2
TR15619	60.4	80.6	10.4	12.9	1.3
QUEST	55.6	89.2	13.3	24.5	2.8
Conlon	52.3	76.4	15.6	19.4	2.8
ND20493	54.5	79.7	17.3	19.6	4.4
Robust	56.0	93.3	21.0	33.5	4.8
Chevron	60.7	81.7	9.8	17.1	2.2
Stander	56.9	100.0	24.5	41.0	8.6

[1] Date from planting when 50% of heads 50% emerged at four locations, Brandon, MB data not included.
[2] FHB incidence means at two locations.
[3] FHB severity means at four locations.
[4] DON content means at five locations for misted and two for dryland.

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

Location	May	June	July	August
Fargo, ND	-2.1	1.0	1.6	0.2
Langdon, ND	0	0	-2	0
Casselton, ND	-2.1	1.0	0.5	-0.2
St. Paul, MN	-1.7	0.9	-1.4	-1.7
Crookston, MN	-2.1	-0.4	0.9	-1.7
Brandon, MB	-3.6	2.2	3	2.3

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

Location	May	June	July	August
Fargo, ND	5.0	-1.2	-0.01	-1.3
Langdon, ND	0.9	0.6	-0.5	-0.8
Casselton, ND	5.3	0.1	0.1	-1.2
St. Paul, MN	1.0	0.2	0.1	0.5
Crookston, MN	-0.3	-0.1	2.0	-2.0
Brandon, MB	-2.2	-1.8	-1.5	-0.5

Table 8. Correlation among locations for DON content.							
	Misted					Dryland	
Location	Fargo	Langdon	Brandon	Crookston	St. Paul	Casselton	Osnabrock
Fargo	1.0	**0.56	0.18	*0.36	0.26	**0.47	**0.65
Langdon	**0.56	1.0	**0.36	**0.71	*0.35	*0.36	**0.71
Brandon	0.18	**0.36	1.0	0.19	**0.45	*0.29	*0.29
Crookston	*0.36	**0.71	0.19	1.0	*0.29	0.24	**0.42
St. Paul	0.26	*0.35	**0.45	*0.29	1.0	**0.43	0.27
Casselton	**0.47	*0.36	*0.29	0.23	**0.43	1.0	**0.43
Osnabrock	**0.65	**0.71	*0.29	**0.42	0.27	**0.43	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 2015

Entry	Name	Pedigree	Orgin	Row type
1	ND29196	ND20299/ND21786	North Dakota State University	6-row
2	ND29380	ND25025/ND21843	North Dakota State University	6-row
3	ND30304	Quest/ND25165	North Dakota State University	6-row
4	ND30320	Quest/ND25165	North Dakota State University	6-row
5	ND30377	Quest/ND25165	North Dakota State University	6-row
6	ND31091	ND25160/ND26036	North Dakota State University	6-row
7	ND31040	ND20448/ND26085	North Dakota State University	6-row
8	ND31721	Celebration/ND26181	North Dakota State University	6-row
9	2ND30639	2ND25253/Posada	North Dakota State University	2-row
10	2ND30724	2ND25265/2ND26328	North Dakota State University	2-row
11	2ND30749	2ND25625/2ND26333	North Dakota State University	2-row
12	2ND30837	2ND25265/Grace	North Dakota State University	2-row
13	2ND30879	2ND25270/2ND25275	North Dakota State University	2-row
14	2ND31815	2ND24263/Grace	North Dakota State University	2-row
15	2ND31914	2ND24388/Lilly	North Dakota State University	2-row
16	2ND32184	2ND25275/Grace	North Dakota State University	2-row
17	04/506/42/8		Line from Saatzucht Ackermann	2-row
18	M159	Quest / FEG183-52	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	S6M163	MS10S4014-007 / MS10S4037-010	University of Minnesota	6-row
22	S6M164	MS10S4021-013 / MS10S4058-024	University of Minnesota	6-row
23	S6M165	MS10S4034-018 / MS10S4029-013	University of Minnesota	6-row
24	S6M166	MS10S4034-018 / MS10S4029-013	University of Minnesota	6-row
25	S6M167	MS10S4063-013 / MS10S4036-002	University of Minnesota	6-row
26	2B12-5417	2B05-0676 / 2B06-0929	BAR - LLC	2-row
27	2B12-5459	2B05-0615 // 2B05-0802 / 2B06-1143	BAR - LLC	2-row

Table 9 cont: Pedigree and source of breeding lines tested for FHB resistance in 2015

Entry	Name	Pedigree	Orgin	Row type
28	2B12-5496	2B05-0802 / 2B06-1143 // 2B05-0615 / 2B05-0802	BAR - LLC	2-row
29	2B12-5582	2B05-0728 / 2B06-0929	BAR - LLC	2-row
30	2B12-5593	2B05-0802 / 2B06-0929	BAR - LLC	2-row
31	2B12-5643	2B05-0829 // 2B05-0829 / 2B06-0929	BAR - LLC	2-row
32	2B12-5651	2B05-0829 // 2B06-0929 / 2B06-1144	BAR - LLC	2-row
33	2B12-5656	2B06-1144 // 2B03-3719 / 2B05-0829	BAR - LLC	2-row
34	TR15242	Major//TR05288/Norman	Agriculture and Agri-Food Canada (Legge)	2-row
35	TR15246	TR05288/CDC Mindon	Agriculture and Agri-Food Canada (Legge)	2-row
36	TR15247	Cerveza/Norman	Agriculture and Agri-Food Canada (Legge)	2-row
37	BM0728-039	Azul/Legacy//Legacy	Agriculture and Agri-Food Canada (Badea)	6-row
38	SM132104	TR10124/SB080716	Crop Development Centre - University of SK	2-row
39	SM130675	MT020155/TR09121	Crop Development Centre - University of SK	2-row
40	SM132139	TR09398/CDC Kindersley	Crop Development Centre - University of SK	2-row
41	SM130161	Marine/SM060314//TR08203	Crop Development Centre - University of SK	2-row
42	HB 627	I99043001/H91001033	Field Crop Development Centre - ARD	2-row
43	HB 628	CDC COWBOY/CDC RATTAN	Field Crop Development Centre - ARD	2-row
44	SR15504	MAHIGAN/H02019	Field Crop Development Centre - ARD	6-row
45	TR15619	MANLEY/LEO//TR238///PONOKA	Field Crop Development Centre - ARD	2-row
46	QUEST	FEG18-20 / M110		6-row
47	Conlon	BOWMAN*2/DWS1008/ND10232		2-row
48	ND 20493	ND16918*2/CIho 6611		6-row
49	Robust	MOREX/MANKER		6-row
50	Chevron	UNKNOWN		6-row
51	Stander	ROBUST*2/3/CREE/BONANZA// MANKER/4/ROBUST/BUMBER		6-row