2017

NORTH AMERICAN BARLEY SCAB EVALUATION NURSERY (NABSEN) REPORT

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INTRODUCTION

The 2017 North American Barley Scab Evaluation Nursery (NABSEN) was grown at Fargo, Langdon, and Casselton, ND; St. Paul and Crookston MN, and Brandon, Manitoba. Nurseries either were 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 ND20493 (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

There was no disease severity taken at Casselton and Osnabrock dryland nurseries. FHB disease severity levels were moderate at St. Paul, Brandon MD and high at Fargo, Langdon and Crookston locations in 2017. Levels of DON were high in Fargo and Langdon and moderate at Brandon, MD and moderately low at Osnabruck and Casselton the two-dryland locations (Table 4). HB632, TR15152, TR17640 and 2ND28065 had the lowest DON levels compared to the standard checks.

Generally temperatures were near the 30-year average or slightly above (table. 6), for May, June and July at all locations except Casselton; was slightly below the average in July. All locations had temperatures below the 30-year average in August in 2017.

Precipitation were near or below the 30-year average at all locations except at St. Paul in May and August and Casselton in July (Table.7) which were above the long-term average.

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))
- 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 (no DON data for St. Paul)
- Day to heading counted from date planted to 50% of heads emerged 50%

BRANDON, MANITOBA – Ana Badea 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 2017 NABSEN Nursery at five locations.

Line	Fargo	Langdon	Brandon	St. Paul	Crookston	**Mean**
ND32920	19.6	40.6	5.2	16.2	50.5	**26.4**
ND34118	29.2	55.7	29.7	25.7	72.0	**42.5**
ND34318	25.4	36.4	5.0	18.7	44.0	**25.9**
ND35044	26.2	28.2	7.7	16.7	46.5	**25.1**
ND35199	17.4	43.7	13.4	31.3	48.5	**30.9**
ND35204	31.9	58.0	10.6	20.8	54.0	**35.1**
ND35207	29.4	51.1	13.0	26.0	61.7	**36.2**
ND35210	28.3	45.6	14.3	20.2	45.8	**30.8**
2ND28065	13.3	21.7	3.8	12.5	20.7	**14.4**
2ND32184	13.5	21.3	4.0	11.8	30.5	**16.2**
2ND32529	12.3	20.8	8.1	17.7	24.8	**16.7**
2ND32829	13.5	25.1	2.9	19.5	52.3	**22.7**
2ND34634	10.8	15.1	7.7	15.8	26.0	**15.1**
2ND34729	13.6	21.5	6.2	12.5	24.5	**15.7**
2ND34868	18.9	35.6	11.8	17.8	24.5	**21.7**
2ND34884	15.0	19.6	4.1	15.5	30.5	**17.0**
S6M164	17.1	19.4	2.7	18.7	23.2	**16.2**
S6M166	21.9	29.6	4.3	23.0	41.7	**24.1**
S6M168	23.1	35.3	8.7	15.3	39.3	**24.3**
S6M171	20.4	40.3	8.4	13.3	32.8	**23.1**
S6M172	21.4	36.7	2.1	14.8	37.8	**22.6**
S6M173	14.7	30.7	3.5	11.7	50.3	**22.2**
S6M174	17.5	28.2	7.3	11.3	39.7	**20.8**
S6M175	15.4	27.8	1.1	25.8	32.8	**20.6**
2B10-4162	18.7	18.5	8.6	19.2	31.8	**19.4**
2B10-4378	16.4	20.0	8.1	15.3	27.2	**17.4**

Table 1. cont: Mean FHB severity of entries grown in the 2017 NABSEN Nursery at five locations.

Line	Fargo	Langdon	Brandon	St. Paul	Crookston	**Mean**
2B10-4949	20.5	25.6	13.8	16.2	34.8	**22.2**
2B10-5166	21.4	29.2	6.2	16.2	53.2	**25.2**
2B10-5582	18.1	22.5	9.9	21.8	42.3	**22.9**
2B10-5651	19.0	27.3	11.5	20.2	49.8	**25.5**
2B10-5760	16.4	28.8	7.4	11.5	33.7	**19.5**
2B10-6776	20.4	24.5	16.2	16.3	36.5	**22.8**
TR17252	12.1	19.2	2.2	12.5	14.2	**12.0**
TR17253	14.6	57.9	4.8	9.5	25.2	**22.4**
BM0821-167	14.0	19.6	8.7	8.5	13.5	**12.9**
SR15319	27.6	44.2	4.8	18.5	21.7	**23.3**
TR15152	15.5	17.2	2.2	13.2	14.0	**12.4**
SM142564	16.9	29.5	4.9	10.8	24.7	**17.4**
SM140827	16.7	12.7	2.7	11.7	23.0	**13.4**
SM142003	11.6	16.8	2.6	9.8	14.0	**11.0**
TR17639	12.4	11.8	2.9	12.3	29.8	**13.8**
TR17640	12.0	17.3	2.3	13.2	13.7	**11.7**
FB485	16.7	21.1	4.4	9.2	24.3	**15.1**
HB632	14.4	11.9	8.7	8.7	48.7	**18.5**
QUEST	17.4	39.5	1.6	13.2	26.0	**19.5**
Conlon	15.7	30.6	6.6	10.0	36.3	**19.9**
ND20493	20.3	36.8	6.5	19.8	51.7	**27.0**
Robust	17.7	35.0	10.3	24.7	50.0	**27.5**
Chevron	4.3	14.4	0.6	6.8	27.1	**10.6**
Stander	25.2	38.5	15.7	18.5	40.7	**27.7**

Table 2. Mean disease incidence of entries grown in the 2017 NABSEN Nursery at three locations.

Line	Fargo	Langdon	Brandon	**Mean**
ND32920	100.0	96.7	80.0	**92.2**
ND34118	100.0	100.0	97.5	**99.2**
ND34318	100.0	100.0	87.5	**95.8**
ND35044	100.0	100.0	85.0	**95.0**
ND35199	100.0	100.0	95.0	**98.3**
ND35204	100.0	100.0	87.5	**95.8**
ND35207	100.0	100.0	92.5	**97.5**
ND35210	100.0	100.0	92.5	**97.5**
2ND28065	96.7	100.0	67.5	**88.1**
2ND32184	100.0	100.0	62.5	**87.5**
2ND32529	93.3	100.0	80.0	**91.1**
2ND32829	96.7	100.0	60.0	**85.6**
2ND34634	90.0	93.3	77.5	**86.9**
2ND34729	100.0	96.7	80.0	**92.2**
2ND34868	100.0	100.0	90.0	**96.7**
2ND34884	100.0	96.7	70.0	**88.9**
S6M164	100.0	100.0	57.5	**85.8**
S6M166	100.0	100.0	75.0	**91.7**
S6M168	100.0	100.0	92.5	**97.5**
S6M171	100.0	100.0	90.0	**96.7**
S6M172	100.0	100.0	60.0	**86.7**
S6M173	100.0	100.0	67.5	**89.2**
S6M174	100.0	100.0	85.0	**95.0**
S6M175	100.0	100.0	55.0	**85.0**
2B10-4162	100.0	93.3	85.0	**92.8**
2B10-4378	100.0	96.7	75.0	**90.6**

Table 2. cont: Mean disease incidence of entries grown in the 2017 NABSEN Nursery at three locations.

Line	Fargo	Langdon	Brandon	**Mean**
2B10-4949	100.0	100.0	92.5	**97.5**
2B10-5166	100.0	100.0	82.5	**94.2**
2B10-5582	100.0	100.0	80.0	**93.3**
2B10-5651	100.0	100.0	95.0	**98.3**
2B10-5760	96.7	100.0	77.5	**91.4**
2B10-6776	100.0	96.7	97.5	**98.1**
TR17252	93.3	100.0	57.5	**83.6**
TR17253	100.0	100.0	77.5	**92.5**
BM0821-167	100.0	100.0	80.0	**93.3**
SR15319	100.0	100.0	75.0	**91.7**
TR15152	100.0	96.7	62.5	**86.4**
SM142564	100.0	96.7	82.5	**93.1**
SM140827	100.0	96.7	70.0	**88.9**
SM142003	96.7	96.7	60.0	**84.4**
TR17639	93.3	93.3	57.5	**81.4**
TR17640	100.0	90.0	55.0	**81.7**
FB485	100.0	100.0	70.0	**90.0**
HB632	100.0	100.0	80.0	**93.3**
QUEST	100.0	100.0	60.0	**86.7**
Conlon	100.0	100.0	70.0	**90.0**
ND20493	100.0	100.0	77.5	**92.5**
Robust	100.0	100.0	82.5	**94.2**
Chevron	83.3	100.0	32.5	**71.9**
Stander	100.0	100.0	87.5	**95.8**

Table 3. Mean days to heading after planting of entries grown in 2017 NABSEN Nursery at five locations.

Line	Fargo	Langdon	Brandon*	St. Paul	Crookston	Mean
ND32920	58.0	54.3	52.0	49.7	49.0	**52.6**
ND34118	59.0	56.0	49.3	50.3	49.3	**52.8**
ND34318	60.0	56.0	55.3	47.3	50.0	**53.7**
ND35044	64.0	56.7	52.3	50.0	51.3	**54.9**
ND35199	60.0	55.7	50.5	47.7	49.0	**52.6**
ND35204	61.0	54.0	50.8	47.0	50.0	**52.6**
ND35207	61.0	55.0	50.0	46.0	47.3	**51.9**
ND35210	56.0	54.0	51.0	47.7	49.7	**51.7**
2ND28065	58.0	56.7	60.8	50.3	52.0	**55.6**
2ND32184	63.0	56.7	56.0	56.7	53.0	**57.1**
2ND32529	60.0	53.7	52.0	50.3	50.0	**53.2**
2ND32829	55.0	52.3	50.5	46.7	47.3	**50.4**
2ND34634	60.0	56.3	59.8	53.0	48.7	**55.6**
2ND34729	60.0	54.7	53.0	50.3	50.0	**53.6**
2ND34868	59.0	54.7	56.8	51.3	52.7	**54.9**
2ND34884	57.0	54.7	55.0	48.3	51.0	**53.2**
S6M164	59.0	56.7	53.3	48.7	53.0	**54.1**
S6M166	60.0	57.0	53.0	50.7	52.3	**54.6**
S6M168	60.0	55.3	55.0	50.0	51.7	**54.4**
S6M171	62.0	56.7	51.5	50.7	49.0	**54.0**
S6M172	60.0	54.7	52.8	50.3	51.7	**53.9**
S6M173	59.0	55.7	50.0	50.7	49.7	**53.0**
S6M174	62.0	55.3	55.0	49.0	51.0	**54.5**
S6M175	64.0	56.7	53.8	49.0	52.0	**55.1**
2B10-4162	60.0	57.3	52.8	52.3	52.3	**55.0**
2B10-4378	59.0	56.7	52.5	52.3	54.0	**54.9**

* 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 2017 NABSEN Nursery at five locations.

Line	Fargo	Langdon	Brandon*	St. Paul	Crookston	Mean
2B10-4949	63.0	57.7	55.8	54.7	54.3	**57.1**
2B10-5166	65.0	56.0	53.0	52.3	54.0	**56.1**
2B10-5582	60.0	55.7	51.8	51.0	52.3	**54.2**
2B10-5651	59.0	55.7	52.3	51.7	53.3	**54.4**
2B10-5760	64.0	56.3	54.3	52.3	54.0	**56.2**
2B10-6776	60.0	55.7	53.5	52.0	54.0	**55.0**
TR17252	63.0	58.7	58.0	58.3	55.0	**58.6**
TR17253	59.0	56.0	55.5	55.7	53.7	**56.0**
BM0821-167	63.0	57.3	56.3	56.3	55.7	**57.7**
SR15319	59.0	55.0	53.0	50.0	53.0	**54.0**
TR15152	60.0	58.3	62.3	56.7	52.7	**58.0**
SM142564	63.0	58.0	59.3	57.0	55.7	**58.6**
SM140827	60.0	57.7	60.0	56.0	56.0	**57.9**
SM142003	64.0	58.7	61.5	56.7	57.7	**59.7**
TR17639	63.0	57.7	54.5	53.3	54.0	**56.5**
TR17640	64.0	57.0	62.5	56.0	54.7	**58.8**
FB485	64.0	57.7	58.8	59.3	59.7	**59.9**
HB632	57.0	56.3	53.3	52.3	51.0	**54.0**
QUEST	57.0	55.0	49.0	50.3	51.0	**52.5**
Conlon	56.0	53.7	46.8	50.7	46.7	**50.8**
ND20493	60.0	57.0	49.5	48.0	47.0	**52.3**
Robust	59.0	55.0	56.0	49.0	52.0	**54.2**
Chevron	65.0	59.0	58.3	57.7	56.7	**59.3**
Stander	63.0	56.0	49.0	50.7	53.0	**54.3**

* 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 2017 NABSEN Nursery at six locations.

	Misted					Non-misted		
Line	Fargo	Langdon	Brandon	Crookston	**mean**	Osnabrock	Casselton	**mean**
ND32920	26.7	39.1	23.9	25.0	**28.7**	1.7	0.04	**0.9**
ND34118	44.5	52.2	42.3	31.8	**42.7**	3.0	0.04	**1.5**
ND34318	25.2	38.2	28.5	35.5	**31.9**	1.2	0.04	**0.6**
ND35044	22.5	31.3	33.7	32.0	**29.9**	1.0	0.00	**0.5**
ND35199	13.4	41.9	21.6	30.3	**26.8**	1.1	0.00	**0.6**
ND35204	40.9	46.9	34.1	32.3	**38.5**	1.3	0.00	**0.7**
ND35207	44.0	57.4	30.1	30.3	**40.5**	1.5	0.00	**0.8**
ND35210	44.5	44.0	32.3	14.2	**33.7**	1.0	0.00	**0.5**
2ND28065	9.2	12.4	11.6	5.5	**9.7**	0.3	0.00	**0.2**
2ND32184	21.1	29.5	14.3	28.1	**23.3**	0.4	0.00	**0.2**
2ND32529	14.6	26.8	5.6	9.3	**14.1**	0.2	0.00	**0.1**
2ND32829	17.1	16.3	7.1	10.0	**12.6**	0.0	0.00	**0.0**
2ND34634	19.9	27.5	17.1	10.5	**18.8**	0.5	0.00	**0.3**
2ND34729	19.2	32.9	14.5	2.6	**17.3**	0.4	0.00	**0.2**
2ND34868	24.6	36.6	16.8	12.7	**22.7**	1.0	0.00	**0.5**
2ND34884	14.0	14.8	14.0	20.7	**15.9**	0.5	0.00	**0.2**
S6M164	17.3	18.1	16.9	20.4	**18.2**	0.4	0.02	**0.2**
S6M166	18.8	20.5	17.3	16.7	**18.3**	0.5	0.02	**0.2**
S6M168	24.2	32.2	25.7	13.5	**23.9**	1.4	0.02	**0.7**
S6M171	15.3	18.1	10.1	15.4	**14.7**	0.4	0.02	**0.2**
S6M172	15.4	21.1	8.7	16.0	**15.3**	0.7	0.02	**0.4**
S6M173	21.0	26.0	8.6	12.7	**17.1**	1.0	0.02	**0.5**
S6M174	12.7	25.8	18.0	21.6	**19.5**	1.4	0.00	**0.7**
S6M175	12.7	23.7	13.5	18.5	**17.1**	0.6	0.01	**0.3**
2B10-4162	19.3	22.8	12.7	26.5	**20.3**	0.3	0.01	**0.2**
2B10-4378	19.3	23.6	13.7	11.3	**17.0**	0.4	0.01	**0.2**

Table 4. cont: Mean for DON (ppm) entries grown in 2017 NABSEN Nursery at six locations.

	Misted					Non-misted		
Line	Fargo	Langdon	Brandon	Crookston	**mean**	Osnabrock	Casselton	**mean**

2B10-4949	20.4	24.1	11.3	13.6	**17.3**	0.1	0.00	**0.1**
2B10-5166	13.3	27.1	11.2	45.8	**24.3**	0.6	0.00	**0.3**
2B10-5582	28.4	25.1	16.4	23.8	**23.4**	0.4	0.06	**0.2**
2B10-5651	15.3	28.8	16.1	42.5	**25.7**	0.3	0.06	**0.2**
2B10-5760	21.7	24.4	14.3	30.4	**22.7**	0.6	0.06	**0.3**
2B10-6776	17.9	29.9	21.9	18.7	**22.1**	0.5	0.01	**0.3**
TR17252	9.2	15.9	9.9	17.2	**13.1**	0.3	0.04	**0.2**
TR17253	12.9	26.4	12.1	19.0	**17.6**	0.8	0.04	**0.4**
BM0821-167	7.9	15.9	17.4	7.3	**12.1**	0.2	0.02	**0.1**
SR15319	30.2	52.2	22.4	11.4	**29.0**	0.7	0.02	**0.3**
TR15152	4.0	9.7	6.6	8.3	**7.1**	0.1	0.02	**0.0**
SM142564	13.4	25.2	14.7	18.5	**17.9**	0.5	0.03	**0.3**
SM140827	9.8	12.6	9.1	10.1	**10.4**	0.1	0.02	**0.1**
SM142003	7.5	17.2	18.2	10.0	**13.2**	0.6	0.09	**0.4**
TR17639	10.8	11.6	10.4	23.8	**14.2**	0.1	0.08	**0.1**
TR17640	8.4	15.4	10.1	4.8	**9.7**	0.4	0.07	**0.2**
FB485	13.0	20.7	11.5	25.1	**17.6**	0.2	0.00	**0.1**
HB632	7.6	7.1	8.7	5.2	**7.1**	0.1	0.01	**0.1**
QUEST	28.6	22.7	10.3	13.0	**18.6**	0.4	0.02	**0.2**
Conlon	16.2	30.9	10.1	12.3	**17.4**	0.5	0.06	**0.3**
ND20493	20.4	29.3	8.0	12.8	**17.7**	0.5	0.06	**0.3**
Robust	18.8	45.4	31.3	35.2	**32.7**	1.0	0.10	**0.6**
Chevron	5.3	11.1	6.5	35.2	**14.5**	0.1	0.09	**0.1**
Stander	27.6	35.5	25.9	29.4	**29.6**	1.2	0.12	**0.7**

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

	Day to[1]	FHB[2]	FHB[3]	Misted[4]	Non-misted[4]
Line	Heading	Incidence	Severity	DON Mean	DON Mean

ND32920	52.6	92.2	26.4	28.7	0.9
ND34118	52.8	99.2	42.5	42.7	1.5
ND34318	53.7	95.8	25.9	31.9	0.6
ND35044	54.9	95.0	25.1	29.9	0.5
ND35199	52.6	98.3	30.9	26.8	0.6
ND35204	52.6	95.8	35.1	38.5	0.7
ND35207	51.9	97.5	36.2	40.5	0.8
ND35210	51.7	97.5	30.8	33.7	0.5
2ND28065	55.6	88.1	14.4	9.7	0.2
2ND32184	57.1	87.5	16.2	23.3	0.2
2ND32529	53.2	91.1	16.7	14.1	0.1
2ND32829	50.4	85.6	22.7	12.6	0.0
2ND34634	55.6	86.9	15.1	18.8	0.3
2ND34729	53.6	92.2	15.7	17.3	0.2
2ND34868	54.9	96.7	21.7	22.7	0.5
2ND34884	53.2	88.9	17.0	15.9	0.2
S6M164	54.1	85.8	16.2	18.2	0.2
S6M166	54.6	91.7	24.1	18.3	0.2
S6M168	54.4	97.5	24.3	23.9	0.7
S6M171	54.0	96.7	23.1	14.7	0.2
S6M172	53.9	86.7	22.6	15.3	0.4
S6M173	53.0	89.2	22.2	17.1	0.5
S6M174	54.5	95.0	20.8	19.5	0.7
S6M175	55.1	85.0	20.6	17.1	0.3
2B10-4162	55.0	92.8	19.4	20.3	0.2
2B10-4378	54.9	90.6	17.4	17.0	0.2

[1]Date from planting when 50% of heads 50% emerged at four locations.
[2]FHB incidence means at three locations.
[3]FHB severity means at five 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.

	Day to[1]	FHB[2]	FHB[3]	Misted[4]	Non-misted[4]
Line	Heading	Incidence	Severity	DON Mean	DON Mean
2B10-4949	57.1	97.5	22.2	17.3	0.1

2B10-5166	56.1	94.2	25.2	24.3	0.3
2B10-5582	54.2	93.3	22.9	23.4	0.2
2B10-5651	54.4	98.3	25.5	25.7	0.2
2B10-5760	56.2	91.4	19.5	22.7	0.3
2B10-6776	55.0	98.1	22.8	22.1	0.3
TR17252	58.6	83.6	12.0	13.1	0.2
TR17253	56.0	92.5	22.4	17.6	0.4
BM0821-167	57.7	93.3	12.9	12.1	0.1
SR15319	54.0	91.7	23.3	29.0	0.3
TR15152	58.0	86.4	12.4	7.1	0.0
SM142564	58.6	93.1	17.4	17.9	0.3
SM140827	57.9	88.9	13.4	10.4	0.1
SM142003	59.7	84.4	11.0	13.2	0.4
TR17639	56.5	81.4	13.8	14.2	0.1
TR17640	58.8	81.7	11.7	9.7	0.2
FB485	59.9	90.0	15.1	17.6	0.1
HB632	54.0	93.3	18.5	7.1	0.1
QUEST	52.5	86.7	19.5	18.6	0.2
Conlon	50.8	90.0	19.9	17.4	0.3
ND20493	52.3	92.5	27.0	17.7	0.3
Robust	54.2	94.2	27.5	32.7	0.6
Chevron	59.3	71.9	10.6	14.5	0.1
Stander	54.3	95.8	27.7	29.6	0.7

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

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

Location	May	June	July	August

Fargo, ND	0	2.0	1.0	-3.0
Langdon, ND	0	1	1	-2.0
Casselton, ND	-1	0	-3.0	-4.0
St. Paul, MN	-.5	2.5	1.5	-2.5
Crookston, MN	-0.8	0.8	0	-2.6
Brandon, MB	1.7	1.8	2.1	-0.4

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

Location	May	June	July	August
Fargo, ND	-1.8	-1.6	-1.9	-0.3
Langdon, ND	-1.4	-.4	-1.3	-0.2
Casselton, ND	-2.3	-0.5	+6.5	-0.6
St. Paul, MN	1.4	0	-.9	2.5
Crookston, MN	-1.9	0	-1.7	-1.9
Brandon, MB	-1.4	0	-1.2	-0.7

Table 8. Correlation among locations for DON content.

	Misted	Dryland

Location	Fargo	Langdon	Brandon	Crookston	Osnabrock	Casselton
Fargo	1.0	**0.82	**0.73	0.27	**0.67	-0.13
Langdon	**0.82	1.0	**0.78	*0.39	**0.75	-0.05
Brandon	**0.73	**0.78	1.0	*0.44	**0.80	0.03
Crookston	0.27	*0.39	*0.44	1.0	*0.38	0.23
Osnabrock	**.067	**0.75	**0.80	*0.38	1.0	0.04
Casselton	-0.13	-0.05	0.03	0.23	0.04	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 2017

Entry	Line	Pedigree	Row type	Source
1	ND32920	ND28479/INNOVATION	6	North Dakota State University
2	ND34118	ND28539/ND26804	6	North Dakota State University
3	ND34318	ND26902/ND28993	6	North Dakota State University

4	ND35044	ND26902/ND29053	6	North Dakota State University
5	ND35199	6B07-1819/ND28628	6	North Dakota State University
6	ND35204	6B07-1819/ND28993	6	North Dakota State University
7	ND35207	6B07-1819/ND28993	6	North Dakota State University
8	ND35210	6B07-1819/ND28993	6	North Dakota State University
9	2ND28065	2ND21867/2ND24383	2	North Dakota State University
10	2ND32184	2ND25275/GRACE	2	North Dakota State University
11	2ND32529	2ND27705/2ND27560	2	North Dakota State University
12	2ND32829	2ND27480/2ND28065	2	North Dakota State University
13	2ND34634	2ND28131/2ND27699	2	North Dakota State University
14	2ND34729	2ND27705/2ND29977	2	North Dakota State University
15	2ND34868	04/506/42/8/2ND30635	2	North Dakota State University
16	2ND34884	2ND29817/2ND30635	2	North Dakota State University
17	S6M164 (MS11S3038-016)	MS10S4021-013 / MS10S4058-024	6	University of Minnesota
18	S6M166 (MS11S3058-021)	MS10S4034-018 / MS10S4029-013	6	University of Minnesota
19	S6M168 (MS12_4151-004)	MS11S3058-014 / MS11S3080-019	6	University of Minnesota
20	S6M171 (MS13_5525-017)	MS12_2145-016 / MS12_2139-019	6	University of Minnesota
21	S6M172 (MS13_5529-023)	MS12_2148-014 / MS12_2181-003	6	University of Minnesota
22	S6M173 (MS13_5533-011)	MS12_2149-012 / MS12_2132-013	6	University of Minnesota
23	S6M174 (MS13_5545-015)	MS12_2162-007 / MS12_2148-014	6	University of Minnesota
24	S6M175 (Gen10-144)	Gen2-129 / Lacey	6	University of Minnesota
25	2B10-4162	MERIT 57/2B05-0712	2	BAR - LLC
26	2B10-4378	2B99-2763-10/2B03-3669//2B05-0822/2B99-2763-10	2	BAR - LLC

Table 9. cont: Pedigree and source of breeding lines tested for FHB resistance in 2017

Entry	Line	Pedigree	Row type	Source
27	2B11-4949	MERIT 57/MT050118	2	BAR - LLC
28	2B11-5166	2B03-3604/2B06-1161	2	BAR - LLC
29	2B12-5582	2B05-0728/2B06-0929	2	BAR - LLC
30	2B12-5651	2B05-0829//2B06-0929/2B06-1144	2	BAR - LLC

31	2B12-5760	2B05-0829/2B06-0929//2B05-0829/2B06-1144	2	BAR - LLC
32	2B13-6776	2B05-0614/ABI BALSTER//2B05-0728/2B06-1144	2	BAR - LLC
33	TR17252	CDC Landis/TR07299	2	Agriculture and Agri-Food Canada(Tucker, Badea)
34	TR17253	TR07299//TR06390/Cerveza	2	Agriculture and Agri-Food Canada(Tucker, Badea)
35	BM0821-167	BM0270D-109//Major/Norman	2	Agriculture and Agri-Food Canada(Tucker, Badea)
36	SR15319	M129/STELLAR_ND	6	Agriculture and Agri-Food Canada(Tucker, Badea)
37	TR15152	2ND21867/TR08116	2	Agriculture and Agri-Food Canada(Tucker, Badea)
38	SM142564	SM092090/AAC Synergy	2	Agriculture and Agri-Food Canada(Tucker, Badea)
39	SM140827	MT020204/TR08117//SM080704	2	Agriculture and Agri-Food Canada(Tucker, Badea)
40	SM142003	TR11130/AAC Synergy	2	Agriculture and Agri-Food Canada(Tucker, Badea)
41	TR17639	TR06390/TR06673	2	Agriculture and Agri-Food Canada(Tucker, Badea)
42	TR17640	TR06676/TR06297	2	Agriculture and Agri-Food Canada(Tucker, Badea)
43	FB485	LIMON/BICHY2000//GRIT	2	Agriculture and Agri-Food Canada(Tucker, Badea)
44	HB632	CDC COWBOY/CDC RATTAN	2	Agriculture and Agri-Food Canada(Tucker, Badea)
45	QUEST	FEG18-20 / M110	6	
46	Conlon	BOWMAN*2/DWS1008/ND10232	2	
47	ND 20493	ND16918*2/CIho 6611	6	
48	Robust	MOREX/MANKER	6	
49	Chevron	UNKNOWN	6	
50	Stander	ROBUST*2/3/CREE/BONANZA// MANKER/4/ROBUST/BUMBER	6	