

2020

**NORTH AMERICAN BARLEY SCAB EVALUATION NURSERY
(NABSEN) REPORT**

Thomas Baldwin

***Patrick Gross**

Department of Plant Pathology North Dakota State University

***address all enquiries regarding this report to Patrick Gross, address enclosed**

Collaborating Scientists

<p>Richard D. Horsley Professor & Barley Breeder Department of Plant Sciences North Dakota State University P.O. Box 5051 Fargo, ND 58105-5051, U.S.A. Phone: (701) 231-8142 Fax: (701) 231-8474 Email: Richard.Horsley@ndsu.edu</p>	<p>James Tucker Agriculture & Agri-Food Canada Research Centre P.O. Box 1000A, R.R. #3 Brandon, Manitoba R7A 5Y3 Canada Phone : (204)726-7650 Fax: (204)728-3858 Email: JTucker@AGR.GC.CA</p>
<p>Ruth Dill-Macky Associate Professor Department of Plant Pathology University of Minnesota St Paul MN 55108 Phone: 612-625-2227 Fax: 612-625-9728 Email : ruthdm@umn.edu</p>	<p>Ana Badea, PhD Research Scientist, Barley Breeding and Genetics Brandon Research and Development Centre Agriculture and Agri-Food Canada 2701 Grand Valley Road Brandon, MB R7A 5Y3 Tel: 204-578-6573 Fax: 204-578-6524 E-mail: ana.badea@agr.gc.ca</p>
<p>Patrick L. Gross Research Specialist Department of Plant Pathology NDSU Dept 7660 P.O. Box 6050 Fargo, ND 58108 Cell Phone: (701)793-1429 Email: Patrick.Gross@ndsu.edu</p>	<p>Kevin P. Smith Assistant Professor Department of Agronomy and Plant Genetics University of Minnesota St. Paul, MN 55108 phone 612-624-1211 fax 612-625-1268 email: smith376@umn.edu</p>
<p>Marie Timmerman Research Technician 3515 Richards Lake Road Fort Collins, CO 80524 Cell Phone: 970-402-0985 Marie.Timmerman@anheuser-busch.com</p>	<p>Thomas T. Baldwin Assistant Professor of Barley Pathology Department of Plant Pathology NDSU Dept# 7660 P.O. Box 6050 Fargo, ND 58108-6050 Thomas.t.baldwin@ndsu.edu Office (701) 231-7078</p>

INTRODUCTION

The 2020 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 non-misted (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

FHB disease severity was not taken at Casselton dryland nurseries. FHB disease severity levels were moderate at Fargo, ND and Brandon, MB and high Langdon, ND, St. Paul and Crookston, MN in 2020. DON levels were high at Langdon and St. Paul and moderately high in Fargo, Brandon, and Crookston, MN. The lowest DON levels were in these lines: S2M180 8.6; 2ND37598 8.7; 2ND32829 9.0; HB19136 9.8 and S2M179 9.8, these were equal to or less than the resistant 2-rowed variety; Conlon which had 9.8 ppm DON. The two dryland locations at Casselton had low DON levels (Table 4).

Temperatures were below the 30-year average (Table. 6), for May at all locations. All locations were above the 30-year average for June and July. August temperatures were generally average at all locations except for St. Paul which was above the 30 year-average (Table 6).

Precipitation were below the 30-year average at all locations in May except for St. Paul which was 1.5 in. above normal. June precipitation were average at all locations except for St. Paul which was above the average by 2.5 in. July precipitation was above the average except for St. Paul which was about 1.0 in. below. Only Fargo and Casselton locations had above average rainfall in August (Table 7).

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Site details are as follows:

Fargo, & Langdon ND – Thomas Baldwin 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%

Casselton, 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 – Marie Timmerman and Austin Case

- 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 2020 NABSEN Nursery at five locations.

Line	Fargo	Langdon	Brandon	Crookston	St. Paul	Mean
2ND32184	18.4	30.0	6.3	41.3	36.5	26.5
2ND32529	14.4	22.6	3.8	34.8	43.3	23.8
2ND32657	22.4	25.5	3.5	28.7	34.8	23.0
2ND32829	21.3	21.3	8.3	66.7	36.2	30.7
2ND34634	10.7	14.6	4.6	13.8	32.7	15.3
2ND34697	19.5	18.0	4.6	21.2	49.0	22.5
2ND34954	22.8	20.8	6.1	39.2	32.7	24.3
2ND34962	20.5	19.2	4.2	29.3	46.7	24.0
2ND35415	28.4	24.1	8.6	38.5	32.2	26.4
2ND35693	19.1	16.1	2.8	28.8	42.2	21.8
2ND36638	18.8	17.1	3.6	19.8	43.8	20.6
2ND36642	13.8	17.1	4.3	21.5	43.7	20.1
2ND37111	23.0	22.3	7.7	9.2	46.0	21.6
2ND37130	18.0	22.7	6.5	12.7	39.2	19.8
2ND37568	21.4	20.0	8.6	14.2	34.3	19.7
S2M178 (TM14.030-7)	28.0	35.0	11.0	49.3	66.0	37.9
S2M179 (TM15.002-12)	25.2	26.8	9.0	35.8	34.8	26.3
S2M180 (TM15.002-19)	26.3	27.5	5.9	40.0	44.3	28.8
S2M182 (TM15.162-27)	25.6	24.2	5.0	43.7	54.0	30.5
S2M184 (TM15.162-11)	26.5	34.0	7.4	64.6	54.0	37.3
S2M185 (2MS17_3463-020)	30.5	41.7	6.2	23.0	37.8	27.8
S2M186 (TM16.242-011)	26.0	41.4	20.7	65.2	54.2	41.5
S2M187 (TM16.259-009)	24.2	29.6	6.9	68.0	49.3	35.6
2IK14-8413	25.5	35.8	4.2	33.5	38.5	27.5
2IK15-9655	26.7	23.8	5.3	29.8	40.5	25.2

Table 1. cont.: Mean FHB severity of entries grown in the 2020 NABSEN Nursery at five locations.

Line	Fargo	Langdon	Brandon	Crookston	St. Paul	Mean
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2IK16-0897	19.0	36.5	3.8	23.7	29.3	22.5
2IK16-1184	13.2	38.8	6.0	25.5	40.8	24.9
2IK16-1190	21.4	27.1	7.9	29.7	62.2	29.6
2IK16-1197	29.0	21.7	7.4	24.0	56.0	27.6
2IK16-1210	14.3	33.3	5.4	28.5	47.8	25.9
TR20271	12.5	15.0	2.5	15.7	14.0	11.9
TR20272	16.5	12.1	5.7	13.3	33.0	16.1
TR20273	19.8	26.0	2.7	27.8	36.3	22.5
HB19136	13.6	30.8	3.0	25.0	54.7	25.4
TR18172	15.0	30.5	3.3	27.0	48.5	24.9
TR19175	15.6	32.7	4.7	33.8	54.2	28.2
TR19178	21.5	33.1	3.6	14.3	20.7	18.6
TR19179	12.5	22.7	7.2	10.5	30.2	16.6
TR19650	13.7	25.7	3.9	10.5	17.5	14.3
TR19655	17.1	33.8	7.5	20.7	17.5	19.3
SR19543	21.1	61.8	11.1	20.5	43.5	31.6
SR19547	22.1	62.1	20.1	51.3	65.2	44.2
Quest	28.8	33.5	5.1	16.0	20.7	20.8
Conlon	20.0	27.2	5.5	49.2	39.5	28.3
ND20493	17.8	27.9	7.0	35.0	35.8	24.7
Robust	37.5	49.1	8.5	31.7	30.5	31.4
Chevron	7.0	14.2	1.6	3.0	22.5	9.7
Stander	35.6	53.6	22.9	37.8	61.5	42.3

Table 2. Mean disease incidence of entries grown in the 2020 NABSEN Nursery at three locations.

Line	Fargo	Langdon	Brandon	Mean
2ND32184	100.0	100	80.0	90.8
2ND32529	100.0	100	65.0	85.7
2ND32657	96.7	100	52.5	87.4

2ND32829	100.0	100	75.0	86.1
2ND34634	86.7	90	65.0	82.9
2ND34697	93.3	100	62.5	89.3
2ND34954	100.0	100	80.0	90.7
2ND34962	96.7	100	67.5	91.5
2ND35415	100.0	100	85.0	88.9
2ND35693	93.3	100	55.0	85.6
2ND36638	100.0	100	65.0	86.9
2ND36642	96.7	100	60.0	86.9
2ND37111	100.0	100	65.0	90.8
2ND37130	100.0	100	80.0	94.2
2ND37568	100.0	100	85.0	94.2
S2M178 (TM14.030-7)	100.0	100	80.0	92.9
S2M179 (TM15.002-12)	100.0	100	77.5	90.4
S2M180 (TM15.002-19)	100.0	100	65.0	90.4
S2M182 (TM15.162-27)	100.0	100	77.5	92.1
S2M184 (TM15.162-11)	100.0	100	75.0	90.8
S2M185 (2MS17_3463-020)	100.0	100	70.0	95.0
S2M186 (TM16.242-011)	100.0	100	100.0	95.4
S2M187 (TM16.259-009)	100.0	100	72.5	89.6
2IK14-8413	100.0	100	65.0	89.2
2IK15-9655	100.0	100	70.0	87.9

Table 2. cont.: Mean disease incidence of entries grown in the 2020 NABSEN Nursery at three locations.

Line	Fargo	Langdon	Brandon	Mean
2IK16-0897	100.0	100	57.5	85.4
2IK16-1184	90.0	100	65.0	88.8
2IK16-1190	100.0	100	77.5	93.3
2IK16-1197	100.0	100	82.5	90.6

2IK16-1210	93.3	100	67.5	83.3
TR20271	96.7	100	42.5	81.1
TR20272	90.0	80	77.5	82.8
TR20273	96.7	100	52.5	83.8
HB19136	93.3	100	60.0	84.2
TR18172	86.7	100	65.0	86.4
TR19175	96.7	100	70.0	89.0
TR19178	100.0	100	67.5	87.8
TR19179	86.7	90	82.5	86.8
TR19650	96.7	100	65.0	88.6
TR19655	100.0	100	70.0	94.2
SR19543	100.0	100	95.0	99.2
SR19547	100.0	100	100.0	95.0
Quest	100.0	100	70.0	89.2
Conlon	100.0	100	65.0	91.3
ND20493	100.0	100	82.5	95.4
Robust	100.0	100	90.0	91.1
Chevron	96.7	100	60.0	92.8
Stander	100.0	100	100.0	100.0

Table 3. Mean days to heading after planting of entries grown in 2020 NABSEN Nursery at four locations.

Line	Fargo	Langdon	Brandon	St. Paul	Mean
2ND32184	59.3	54	51.0	55.0	54.8
2ND32529	60.7	55	48.5	49.0	53.2
2ND32657	57.3	53	47.3	49.3	51.6
2ND32829	55.7	55	46.8	48.0	51.4

2ND34634	62.3	55	49.8	51.7	54.8
2ND34697	60.3	52	48.5	49.7	52.6
2ND34954	60.3	56	48.5	50.7	53.9
2ND34962	60.3	55	45.8	49.3	52.6
2ND35415	58.3	51	46.0	48.0	50.9
2ND35693	61.0	54	47.8	50.7	53.4
2ND36638	61.3	53	45.8	49.0	52.3
2ND36642	63.7	53	49.0	48.7	53.7
2ND37111	62.0	53	49.3	50.3	53.6
2ND37130	59.7	54	49.5	50.3	53.3
2ND37568	58.3	52	51.3	51.3	53.3
S2M178 (TM14.030-7)	63.0	54	51.0	51.7	54.8
S2M179 (TM15.002-12)	59.3	52	47.8	51.7	52.7
S2M180 (TM15.002-19)	59.7	54	47.5	48.7	52.4
S2M182 (TM15.162-27)	62.0	55	48.0	50.0	53.8
S2M184 (TM15.162-11)	59.0	52	45.3	48.3	51.2
S2M185 (2MS17 3463-020)	59.3	56	46.0	49.7	52.7
S2M186 (TM16.242-011)	61.0	56	45.3	50.3	53.1
S2M187 (TM16.259-009)	57.3	55	45.0	48.7	51.4
2IK14-8413	62.7	53	49.5	53.3	54.6
2IK15-9655	62.7	52	47.8	51.3	53.4

¹Day to heading counted from date planted to 80% of heads emerged 50%; other locations 50% heads emerged 50%

Table 3. cont.: Mean days to heading after planting of entries grown in 2020 NABSEN Nursery at four locations.

Line	Fargo	Langdon	Brandon	St. Paul	Mean
2IK16-0897	62.3	52	49.8	52.3	54.2
2IK16-1184	63.0	56	49.8	50.7	54.8
2IK16-1190	63.3	56	49.5	51.7	55.1
2IK16-1197	63.7	54	49.3	51.3	54.5
2IK16-1210	62.3	54	48.3	50.7	53.8

TR20271	64.0	55	50.8	54.3	56.0
TR20272	63.7	54	51.5	52.7	55.5
TR20273	63.0	57	51.0	54.3	56.3
HB19136	65.0	53	51.3	52.7	55.5
TR18172	64.7	53	51.0	50.3	54.8
TR19175	60.7	55	50.8	52.7	54.8
TR19178	60.3	55	51.5	53.3	55.1
TR19179	66.0	57	51.8	55.7	57.7
TR19650	64.7	53	52.5	57.0	56.8
TR19655	64.3	55	51.5	55.0	56.5
SR19543	65.0	53	50.5	55.0	55.8
SR19547	57.7	56	49.3	55.3	54.5
Quest	58.7	55	47.5	50.3	53.0
Conlon	55.7	52	45.5	48.7	50.4
ND20493	57.3	56	44.0	48.0	51.3
Robust	58.3	52	47.5	49.7	51.9
Chevron	64.3	55	52.5	56.3	57.0
Stander	64.0	53	50.8	51.0	54.7

¹Day 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 2020 NABSEN Nursery at seven locations.

Line	Misted					mean	Non- misted		
	Fargo	Langdon	Brandon	Crookston	St. Paul		Casselton ¹	Casselton ²	mean
2ND32184	7.7	17.5	5.9	5.8	14.0	10.2	0.3	0.03	0.2
2ND32529	10.4	29.6	5.5	4.0	15.2	12.9	0.3	0.00	0.1
2ND32657	10.0	31.3	8.2	8.0	32.6	18.0	0.1	0.33	0.2
2ND32829	7.7	14.9	6.9	9.4	5.9	9.0	0.2	0.03	0.1
2ND34634	8.7	24.0	10.2	9.9	18.2	14.2	0.1	0.03	0.1

2ND34697	16.0	28.8	12.1	4.9	18.4	16.0	0.3	0.17	0.2
2ND34954	13.9	24.3	7.3	8.4	12.9	13.4	0.1	0.17	0.1
2ND34962	10.3	28.1	7.8	7.3	11.2	13.0	0.2	0.07	0.1
2ND35415	13.0	24.6	8.1	6.1	17.5	13.9	0.2	0.03	0.1
2ND35693	8.3	17.9	8.5	6.5	17.2	11.7	0.8	0.00	0.4
2ND36638	9.9	26.0	12.6	9.9	17.6	15.2	1.3	0.03	0.7
2ND36642	11.4	14.9	7.8	15.3	14.9	12.9	0.4	0.13	0.3
2ND37111	14.5	21.8	8.0	8.8	21.2	14.9	0.6	0.00	0.3
2ND37130	9.2	20.9	8.1	12.0	24.4	14.9	0.3	0.00	0.1
2ND37568	6.7	13.3	4.6	7.4	11.7	8.7	0.4	0.17	0.3
S2M178 (TM14.030-7)	10.6	28.7	7.2	13.0	23.4	16.6	0.8	0.03	0.4
S2M179 (TM15.002-12)	5.6	23.9	6.3	3.1	10.1	9.8	0.6	0.00	0.3
S2M180 (TM15.002-19)	5.6	16.1	5.2	4.2	11.8	8.6	0.2	0.00	0.1
S2M182 (TM15.162-27)	11.4	25.0	11.6	18.1	25.8	18.4	0.1	0.00	0.1
S2M184 (TM15.162-11)	7.5	27.5	15.1	4.5	22.2	15.4	0.8	0.07	0.4
S2M185 (2MS17 3463-020)	9.5	31.3	8.0	5.0	14.9	13.7	0.1	0.07	0.1
S2M186 (TM16.242-011)	15.9	38.9	23.5	6.9	30.0	23.0	0.7	0.20	0.5
S2M187 (TM16.259-009)	8.3	24.9	8.0	10.9	12.0	12.8	0.2	0.00	0.1
2IK14-8413	8.1	37.9	7.8	10.9	27.4	18.4	0.4	0.13	0.3
2IK15-9655	7.1	32.4	7.1	7.8	19.5	14.8	0.1	0.00	0.0

¹Rich Horsley

²Marie Timmerman and Austin Case

Table 4. (cont.) Means for DON (ppm) entries grown in 2020 NABSEN Nursery at seven locations.

Line	Misted					mean	Non- misted		
	Fargo	Langdon	Brandon	Crookston	St. Paul		Casselton ¹	Casselton ²	mean
27IK16-0897	6.3	24.1	6.7	4.8	17.1	11.8	0.1	0.03	0.1
2IK16-1184	6.1	18.5	7.4	9.4	21.2	12.5	0.2	0.00	0.1
2IK16-1190	10.6	43.8	11.6	14.2	32.2	22.5	0.1	0.00	0.0
2IK16-1197	5.2	38.6	6.3	7.4	25.4	16.6	0.4	0.07	0.3
2IK16-1210	7.9	35.8	11.1	16.2	30.7	20.3	0.2	0.10	0.2
TR20271	4.2	19.8	6.3	5.6	16.9	10.6	0.2	0.13	0.2

TR20272	6.6	21.1	6.8	6.9	20.1	12.3	0.0	0.00	0.0
TR20273	7.1	22.6	7.3	10.4	19.4	13.3	0.1	0.00	0.0
HB19136	1.9	17.4	1.7	8.4	19.8	9.8	0.3	0.00	0.1
TR18172	3.2	18.6	3.6	10.3	29.4	13.0	0.0	0.03	0.0
TR19175	7.3	24.9	5.0	9.1	28.7	15.0	0.9	0.00	0.5
TR19178	7.0	22.8	3.8	8.9	14.2	11.4	0.5	0.00	0.2
TR19179	7.0	36.0	4.4	13.0	18.3	15.7	0.0	0.10	0.1
TR19650	2.9	22.6	3.6	3.6	17.4	10.0	0.0	0.00	0.0
TR19655	9.9	38.7	8.4	22.4	35.4	23.0	0.3	0.03	0.2
SR19543	18.1	49.2	12.2	23.2	59.6	32.5	1.6	0.20	0.9
SR19547	28.0	51.0	22.2	43.3	40.5	37.0	0.2	0.63	0.4
QUEST	12.6	32.0	7.1	11.8	16.0	15.9	0.2	0.00	0.1
Conlon	8.3	22.5	2.2	3.1	12.7	9.8	0.0	0.03	0.0
ND20493	10.3	30.8	6.9	3.9	9.5	12.3	0.1	0.05	0.1
Robust	14.5	43.0	13.5	11.1	19.4	20.3	0.3	0.00	0.2
Chevron	2.6	22.8	1.7	2.5	17.1	9.3	0.1	0.03	0.1
Stander	25.9	46.3	24.3	24.7	34.9	31.2	1.4	0.10	0.8

¹Rich Horsley

²Marie Timmerman and Austin Case

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

Line	Day to Head ¹	FHB ²	FHB ³	DON Misted ⁴	DON Non-misted ⁴
2ND32184	54.8	90.8	26.5	10.2	0.2
2ND32529	53.2	85.7	23.8	12.9	0.1
2ND32657	51.6	87.4	23.0	18.0	0.2
2ND32829	51.4	86.1	30.7	9.0	0.1
2ND34634	54.8	82.9	15.3	14.2	0.1
2ND34697	52.6	89.3	22.5	16.0	0.2
2ND34954	53.9	90.7	24.3	13.4	0.1

2ND34962	52.6	91.5	24.0	13.0	0.1
2ND35415	50.9	88.9	26.4	13.9	0.1
2ND35693	53.4	85.6	21.8	11.7	0.4
2ND36638	52.3	86.9	20.6	15.2	0.7
2ND36642	53.7	86.9	20.1	12.9	0.3
2ND37111	53.6	90.8	21.6	14.9	0.3
2ND37130	53.3	94.2	19.8	14.9	0.1
2ND37568	53.3	94.2	19.7	8.7	0.3
S2M178 (TM14.030-7)	54.8	92.9	37.9	16.6	0.4
S2M179 (TM15.002-12)	52.7	90.4	26.3	9.8	0.3
2M180 (TM15.002-19)	52.4	90.4	28.8	8.6	0.1
S2M182 (TM15.162-27)	53.8	92.1	30.5	18.4	0.1
S2M184 (TM15.162-11)	51.2	90.8	37.3	15.4	0.4
S2M185 (2MS17 3463-020)	52.7	95.0	27.8	13.7	0.1
S2M186 (TM16.242-011)	53.1	95.4	41.5	23.0	0.5
S2M187 (TM16.259-009)	51.4	89.6	35.6	12.8	0.1
2IK14-8413	54.6	89.2	27.5	18.4	0.3
2IK15-9655	53.4	87.9	25.2	14.8	0.0

¹Date from planting when 50% of heads 50% emerged at three locations.

²FHB incidence means at three locations.

³FHB severity incidence at five locations.

⁴DON 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	Day to Head ¹	FHB ²	FHB ³	DON Misted ⁴	DON Non-misted ⁴
2IK16-0897	54.2	85.4	22.5	11.8	0.1
2IK16-1184	54.8	88.8	24.9	12.5	0.1
2IK16-1190	55.1	93.3	29.6	22.5	0.0
2IK16-1197	54.5	90.6	27.6	16.6	0.3
2IK16-1210	53.8	83.3	25.9	20.3	0.2
TR20271	56.0	81.1	11.9	10.6	0.2
TR20272	55.5	82.8	16.1	12.3	0.0

TR20273	56.3	83.8	22.5	13.3	0.0
HB19136	55.5	84.2	25.4	9.8	0.1
TR18172	54.8	86.4	24.9	13.0	0.0
TR19175	54.8	89.0	28.2	15.0	0.5
TR19178	55.1	87.8	18.6	11.4	0.2
TR19179	57.7	86.8	16.6	15.7	0.1
TR19650	56.8	88.6	14.3	10.0	0.0
TR19655	56.5	94.2	19.3	23.0	0.2
SR19543	55.8	99.2	31.6	32.5	0.9
SR19547	54.5	95.0	44.2	37.0	0.4
Quest	53.0	89.2	20.8	15.9	0.1
Conlon	50.4	91.3	28.3	9.8	0.0
ND20493	51.3	95.4	24.7	12.3	0.1
Robust	51.9	91.1	31.4	20.3	0.2
Chevron	57.0	92.8	9.7	9.3	0.1
Stander	54.7	100.0	42.3	31.2	0.8

¹Date from planting when 50% of heads 50% emerged at three locations.

²FHB incidence means at three locations.

³FHB severity means at five locations.

⁴DON content means at five locations for misted and two for dryland.

Table 6. Temperature (°F) compared to the 30-year average 2020

Location	May	June	July	August
Fargo, ND	-2	+5	+3	0
Langdon, ND	-2	+4	+2	0
Casselton, ND	-2	+4	+2	0
St. Paul, MN	-0.4	+4	+2	+2

Crookston, MN	-2.4	+4	+3.0	+0.5
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Table 7. Rainfall (in.) compared to the 30-year average 2020.

Location	May	June	July	August
Fargo, ND	-1.3	-1.2	+2.5	+2
Langdon, ND	-1.5	+0.7	+0.9	-1.0
Casselton, ND	-1.4	-0.8	+1.4	+1.9
St. Paul, MN	+1.5	+2.5	-0.9	-0.3
Crookston, MN	-1.5	+0.2	+3	-0.2

Table 8. Correlation among location for DON levels content in 2019.

Location	Misted				St. Paul	Dryland	
	Fargo	Langdon	Brandon	Crookston		Casselton ¹	Casselton ²
Fargo	1.0	0.64**	0.81**	0.69**	0.47*	0.40*	0.60**
Langdon	0.64**	1.0	0.64**	0.60**	0.69**	0.28	0.47*
Brandon	0.80**	0.64**	1.0	0.58**	0.50*	0.45*	0.51*
Crookston	0.69**	0.60**	0.58**	1.0	0.68**	0.25	0.54**
St. Paul	0.47*	0.69**	0.50*	0.68**	1.0	0.44*	0.41*
Casselton ¹	0.40*	0.28	0.45*	0.25	0.44*	1.0	0.07
Casselton ²	0.60**	0.47*	0.51*	0.54**	0.41*	0.07	1.0

*,** r-values significantly different from 0.0 at P<0.05 and P<0.01, respectively	
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¹Rich Horsley

²Marie Timmerman and Austin Case

Table 9 Pedigree and source of breeding lines tested for FHB resistance in 2020

Entry	Line	Pedigree	Row type	Program
1	2ND32184	2ND25275/GRACE	2	North Dakota State University
2	2ND32529	2ND27705/2ND27560	2	North Dakota State University
3	2ND32657	2ND28086/2ND27705	2	North Dakota State University
4	2ND32829	2ND27480/2ND28065	2	North Dakota State University
5	2ND34634	2ND28131/2ND27699	2	North Dakota State University
6	2ND34697	2ND26333/2ND27705	2	North Dakota State University
7	2ND34954	2ND29977/2ND29990	2	North Dakota State University
8	2ND34962	2ND29977/2ND29990	2	North Dakota State University

9	2ND35415	ND GENESIS/2ND29990	2	North Dakota State University
10	2ND35693	2ND29990/2ND30658	2	North Dakota State University
11	2ND36638	2ND31815/2ND31899	2	North Dakota State University
12	2ND36642	2ND31815/2ND31899	2	North Dakota State University
13	2ND37111	2ND31899/2ND31914	2	North Dakota State University
14	2ND37130	2ND31899/2ND31914	2	North Dakota State University
15	2ND37568	2ND31899/2ND32838	2	North Dakota State University
16	S2M178 (TM14.030-7)	ND-Genesis/ND24510	2	University of Minnesota
17	S2M179 (TM15.002-12)	ND11853//CMB85-533/ND13300/3/7*Bowman/4/ND-Genesis/5/ND23164	2	University of Minnesota
18	S2M180 (TM15.002-19)	ND11853//CMB85-533/ND13300/3/7*Bowman/4/ND-Genesis/5/ND23164	2	University of Minnesota
19	S2M182 (TM15.162-27)	ND-Genesis/3/Bowman*7//Sen 'S'/ND10270/4/ND24388	2	University of Minnesota
20	S2M184 (TM15.162-11)	ND-Genesis/3/Bowman*7//Sen 'S'/ND10270/4/ND24388	2	University of Minnesota
21	S2M185 (2MS17 3463-020)	TM15.016-12 / TM14.013-41	2	University of Minnesota
22	S2M186 (TM16.242-011)	TM14.013-27/TM14.030-07	2	University of Minnesota
23	S2M187 (TM16.259-009)	TM15.002-19/TM14.030-07*	2	University of Minnesota
24	2IK14-8413	2B09-3778/2B09-3943	2	Anheuser-Busch InBev
25	2IK15-9655	2I08-3578/MERIT 57	2	Anheuser-Busch InBev

Table 9. cont.: Pedigree and source of breeding lines tested for FHB resistance in 2020

Entry	Line	Pedigree	Row type	Program
26	2IK16-0897	ANDREIA/C12-1209	2	Anheuser-Busch InBev
27	2IK16-1184	CONCHITA/LA11-0413	2	Anheuser-Busch InBev
28	2IK16-1190	ABBR09-046/ABBR11-12	2	Anheuser-Busch InBev
29	2IK16-1197	UMBRELLA/ABBR11-72	2	Anheuser-Busch InBev
30	2IK16-1210	ABBR09-046/ABBR11-12	2	Anheuser-Busch InBev
31	TR20271	AAC Connect/TR13140	2	AAFC Brandon
32	TR20272	TR02272/TR10214//AAC Synergy	2	AAFC Brandon
33	TR20273	AAC Synergy/BM0406-115	2	AAFC Brandon

34	HB19136	CDC Clear/TR12229	2	AAFC Brandon
35	TR18172	SM101437/AAC Synergy	2	CDC Univ. of SK
36	TR19175	Claymore/CDC Austenson	2	CDC Univ. of SK
37	TR19178	TR10403/TR12133	2	CDC Univ. of SK
38	TR19179	CDC Bow/CDC Fraser	2	CDC Univ. of SK
39	TR19650	H96043002/BENTLEY	2	FCDC
40	TR19655	BENTLEY/AAC SYNERGY	2	FCDC
41	SR19543	T96136007/SUNDRE	6	FCDC
42	SR19547	SUNDRE/VIVAR	6	FCDC
43	QUEST	FEG18-20 / M110	6	
44	Conlon	BOWMAN*2/DWS1008/ND10232	2	
45	ND20493	ND16918*2/CIho 6611	6	
46	Robust	MOREX/MANKER	6	
47	Chevron	UNKNOWN	6	
48	Stander	ROBUST*2/3/CREE/BONANZA//	6	
		MANKER/4/ROBUST/BUMBER		