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North Dakota Barley, Oat and Rye

Variety Trial Results for 2018 and Selection Guide

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Barley, oat and rye varieties currently grown in North Dakota are described in the following tables. Successful production of these crops depends on numerous factors, including selecting the right variety for a particular area. Characteristics to evaluate in selecting a variety are: yield potential in your area, test weight, straw strength, plant height, reaction to problematic diseases and maturity.

Selecting varieties with good quality also is important to maintain market recognition. Because malting barley usually is purchased on an identity-preserved basis, producers are encouraged to determine which barley varieties are being purchased by potential barley buyers before selecting a variety. When selecting a high-yielding and good-quality variety, use data that summarize several years and locations. Additional data from county sites are available at *www.ag.ndsu.edu/varietytrials/* and from each Research Extension Center.

The agronomic data presented in this publication are from replicated research plots using experimental designs that enable the use of statistical analysis. The LSD (least significant difference) numbers beneath the columns in tables are derived from these statistical analyses and apply only to the numbers in the column in which they appear. Differences between two varieties exceeding the LSD value means that with 95 or 90 percent confidence (LSD probability 0.05 or 0.10), the higher-yielding variety has a significant yield advantage.

The abbreviation NS is used to indicate that no statistical difference occurs between varieties. The CV is a measure of variability in the trial. The CV stands for coefficient of variation and is expressed as a percentage. Large CVs mean a large amount of variation could not be attributed to differences in the varieties.

Presentation of data for the entries tested does not imply approval or endorsement by the authors or agencies conducting the test. North Dakota State University approves the reproduction of any table in this publication only if no portion is deleted, if appropriate footnotes are given and if the order of the data is not rearranged.

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Fargo, North Dakota
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Table 1. 2018 North Dakota barley variety descriptions.

					Rachilla					Reaction to Disease[5]			
Variety	Use[1]	Origin[2]	Year Released	Awn Type[3]	Hair Length[4]	Aleurone Color	Height (inch)	Days to Head	Straw Strength	Stem Rust	Spot-form Net Blotch	Spot Blotch	Net Blotch
Six-rowed													
Celebration	M/F	BARI	2008	S	S	White	27	62	Strg.	8	6	3	7
Innovation	MT	BARI	2010	S	L	White	26	62	Strg.	8	6	3	7
Lacey	M/F	MN	2000	S	S	White	26	61	Strg.	8	4	3	7
Quest[6]	M/F	MN	2010	S	L	White	27	61	V.strg.	8	4	3	7
Stellar-ND	M/F	ND	2005	S	L	White	26	61	V.strg.	8	6	3	7
Tradition	M/F	BARI	2003	S	L	White	27	62	V.strg.	8	6	3	7
Two-rowed													
AAC Synergy	M/F	Syngenta	2015	R	L	White	25	64	Strg.	4	3	4	4
ABI Balster	M/F	BARI	2015	R	L	White	25	64	Med.	NA	4	8	NA
ABI Growler	M/F	BARI	2014	R	L	White	25	68	M.strg.	NA	7	8	NA
Conlon[7]	M/F	ND	1996	S	L	White	25	60	Med.	8	4	6	3
Explorer	M	Secobra	NA	R	L	White	22	64	M.strg.	NA	NA	8	4
LCS Genie	M	Limagrain	NA	S	S	White	23	65	V.strg.	NA	6	8	6
ND Genesis	M/F	ND	2015	S	L	White	25	65	M.strg.	8	4	4	6
Pinnacle	M/F	ND	2006	S	L	White	25	63	Strg.	8	8	4	6
Sirish	M	Syngenta	NA	R	L	White	23	63	M.strg.	NA	NA	8	6

[1]M = malting; MT = being tested in plant-scale tests for malting and brewing quality; F = feed.

[2]BARI = Busch Agricultural Resources Inc.; MN = University of Minnesota; ND = North Dakota State University.

[3]R = rough; S = smooth.

[4]S = short; L = long.

[5]Disease reaction scores from 1-9, with 1 = resistant and 9 = very susceptible, NA – not available.

[6]Moderately resistant to Fusarium head blight.

[7]Lower DON accumulations than other varieties tested.

Table 2. Yield and test weight of barley varieties at three locations in eastern North Dakota, 2016-2018.

	Fargo			Carrington			Langdon			Avg. eastern N.D.		
	Test	Yield		Test	Yield		Test	Yield		Test	Yield	
Variety	Wt.	2018	3 Yr.	Wt.	2018	3 Yr.	Wt.	2018	3 Yr.	Wt.	2018	3 Yr.
	(lb/bu)	-----(bu/a)-----		(lb/bu)	-----(bu/a)-----		(lb/bu)	-----(bu/a)-----		(lb/bu)	-----(bu/a)-----	
Six-rowed												
Celebration	51.1	119.9	91.6	45.0	106.1	86.1	49.5	127.9	122.0	48.5	118.0	99.9
Innovation	52.0	121.0	97.7	45.7	108.3	85.7	49.9	117.7	117.2	49.2	115.7	100.2
Lacey	52.5	111.9	87.6	46.6	110.1	88.4	50.4	132.8	127.7	49.8	118.3	101.2
Quest	52.3	119.1	90.5	44.4	110.8	87.0	49.6	126.0	116.0	48.8	118.6	97.8
Stellar-ND	49.8	110.4	89.0	44.5	113.2	90.8	48.8	134.6	123.3	47.7	119.4	101.0
Tradition	52.3	126.2	97.2	46.1	106.9	85.2	49.8	131.3	120.6	49.4	121.5	101.0
Two-rowed												
AAC Synergy	51.6	121.2	--	46.0	113.2	93.1	51.2	146.7	130.1	49.6	127.0	--
ABI Balster	52.5	111.1	--	45.1	104.5	90.3	50.5	142.3	117.2	49.4	119.3	--
ABI Growler	49.4	109.2	--	43.4	93.2	80.4	50.6	133.4	115.3	47.8	111.9	--
Conlon	52.6	96.8	76.4	47.5	103.4	80.9	51.7	111.4	88.4	50.6	103.9	81.9
Explorer	52.6	104.3	--	44.8	101.6	--	51.0	125.0	--	49.5	110.3	--
LCS Genie	51.8	96.0	--	43.5	90.2	80.9	51.0	128.1	107.2	48.8	104.8	--
ND Genesis	52.5	117.8	97.2	43.0	89.8	82.3	50.4	139.2	124.4	48.6	115.6	101.3
Pinnacle	53.4	105.9	85.4	43.1	83.6	80.3	52.0	130.3	122.9	49.5	106.6	96.2
Sirish	53.0	107.3	--	44.1	94.8	81.2	48.9	125.9	113.3	48.7	109.3	--
Mean	51.8	113.1	90.8	45.0	102.4	85.2	50.1	130.0	117.5	49.1	114.7	97.8
CV %	--	4.2	--	1.8	7.0	--	2.3	6.0	--	2.1	6.7	--
LSD 0.05	--	7.3	--	1.2	10.1	--	1.6	11.0	--	1.7	12.8	--
LSD 0.10	--	6.1	--	1.0	8.5	--	1.4	9.2	--	1.5	10.6	--

Table 3. Plump and protein of barley varieties at three locations in eastern North Dakota, 2018.

	Fargo		Carrington		Langdon		Avg. eastern N.D.	
Variety	Plump	Protein	Plump	Protein	Plump	Protein	Plump	Protein
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Six-rowed								
Celebration	87	12.1	96	12.1	98	15.2	94	13.1
Innovation	96	11.7	98	11.2	98	14.7	97	12.5
Lacey	92	11.5	95	11.7	98	14.3	95	12.5
Quest	91	12.7	93	12.0	94	14.1	93	12.9
Stellar-ND	97	11.2	96	11.9	98	13.2	97	12.1
Tradition	92	12.1	96	11.5	96	14.3	95	12.6
Two-rowed								
AAC Synergy	95	10.9	94	11.4	97	13.1	95	11.8
ABI Balster	93	11.7	89	11.5	93	13.4	92	12.2
ABI Growler	90	12.2	86	11.8	97	13.4	91	12.5
Conlon	99	11.9	98	11.6	98	13.8	98	12.4
Explorer	98	11.3	89	11.0	96	13.4	94	11.9
LCS Genie	95	12.1	89	10.8	95	12.9	93	11.9
ND Genesis	97	10.5	85	11.4	97	11.9	93	11.3
Pinnacle	98	9.7	92	10.9	99	12.8	96	11.1
Sirish	98	10.7	92	11.1	97	13.4	96	11.7
Mean	95	11.3	94	11.1	96.2	13.4	95	12.2
CV %	--	--	2.9	5.0	1.5	3.4	3.2	4.1
LSD 0.05	--	--	3.9	0.8	2.0	0.6	5.1	0.8
LSD 0.10	--	--	3.2	0.7	1.7	0.5	4.2	0.7

Table 4. Yield and test weight of barley varieties at four locations in western North Dakota, 2016-2018.

	Dickinson			Hettinger			Minot			Williston			Avg. western N.D.		
	Test	Yield		Test	Yield		Test	Yield		Test	Yield		Test	Yield	
Variety	Wt.	2018	3 Yr.	Wt.	2018	3 Yr.	Wt.	2018	3 Yr.	Wt.	2018	3 Yr.	Wt.	2018	3 Yr.
	(lb/bu)	---(bu/a)---		(lb/bu)	---(bu/a)---		(lb/bu)	---(bu/a)---		(lb/bu)	---(bu/a)---		(lb/bu)	---(bu/a)---	
Six-rowed															
Celebration	52.0	119.9	81.1	43.8	77.0	62.1	44.7	95.2	82.5	52.9	51.7	66.3	48.4	85.9	73.0
Innovation	52.5	127.1	85.0	44.8	76.4	59.6	47.3	97.1	83.8	52.7	54.7	60.8	49.3	88.8	72.3
Lacey	52.5	126.3	82.3	44.3	70.3	59.9	47.0	98.2	82.3	53.5	45.9	60.1	49.3	85.2	71.2
Quest	52.0	124.0	82.0	43.5	70.4	62.3	46.1	90.4	88.6	53.1	54.4	59.8	48.7	84.8	73.2
Stellar-ND	51.6	137.9	86.6	43.3	66.7	58.9	44.8	91.3	83.2	52.5	41.6	55.8	48.0	84.4	71.1
Tradition	53.3	124.9	80.0	44.8	76.4	62.0	46.0	106.2	87.9	53.2	53.6	62.6	49.3	90.3	73.1
Two-rowed															
AAC Synergy	52.8	141.3	93.0	47.1	88.6	68.7	48.5	103.8	95.8	53.6	67.0	68.7	50.5	100.2	81.6
ABI Balster	52.0	134.6	91.6	46.9	85.1	70.4	45.9	93.8	94.0	53.7	61.3	64.9	49.6	93.7	80.2
ABI Growler	50.5	132.7	88.6	45.8	85.4	62.7	44.9	91.6	88.7	53.0	54.9	61.1	48.6	91.1	75.3
Conlon	53.4	79.9	59.9	46.8	75.5	53.4	50.7	82.2	82.6	54.8	49.1	54.9	51.4	71.7	62.7
Explorer	52.9	134.5	--	46.6	95.5	--	46.6	103.1	--	53.6	52.3	--	49.9	96.3	--
LCS Genie	51.4	128.2	90.5	47.3	89.0	69.9	46.6	95.1	95.1	54.0	65.3	69.6	49.8	94.4	81.3
ND Genesis	51.3	134.4	90.8	46.2	90.3	66.4	48.0	98.0	95.3	52.9	54.5	63.6	49.6	94.3	79.0
Pinnacle	53.0	133.9	86.6	47.7	90.4	68.1	48.4	102.1	93.1	53.3	57.8	64.5	50.6	96.1	78.1
Sirish	52.3	132.6	89.7	47.8	88.6	69.5	48.0	106.8	101.0	54.7	58.7	64.2	50.7	96.7	81.1
Mean	52.1	127.8	84.8	45.6	82.9	63.9	46.7	98.1	93.2	53.5	54.3	62.6	49.6	90.3	75.2
CV %	1.4	7.2	--	1.1	5.7	--	1.6	5.5	--	1.3	10.7	--	1.9	8.4	--
LSD 0.05	1.0	13.0	--	0.7	6.7	--	1.2	8.9	--	1.2	9.6	--	1.3	10.8	--
LSD 0.10	0.8	10.8	--	0.6	5.6	--	1.0	7.4	--	1.0	8.0	--	1.1	9.0	--

Table 5. Plump and protein of barley varieties at four locations in western North Dakota, 2018.

	Dickinson		Hettinger		Minot		Williston	Avg. western N.D.	
Variety	Plump	Protein	Plump	Protein	Plump	Protein	Plump	Plump	Protein
	----------(%)----------								
Six-rowed									
Celebration	92	16.3	87	16.4	90	16.0	76	86	16.2
Innovation	94	14.3	89	15.5	94	14.8	76	88	14.9
Lacey	93	15.0	87	15.0	94	15.0	76	88	15.0
Quest	88	13.7	86	15.2	86	15.1	73	83	14.7
Stellar-ND	95	13.8	90	15.1	94	14.2	76	89	14.4
Tradition	94	14.6	88	14.8	90	14.3	75	87	14.6
Two-Rowed									
AAC Synergy	96	13.9	92	14.0	93	14.1	76	89	14.0
ABI Balster	91	14.4	88	14.2	81	14.9	73	83	14.5
ABI Growler	92	14.6	88	14.6	77	15.7	73	82	15.0
Conlon	96	14.3	93	13.9	96	14.0	77	91	14.1
Explorer	95	14.1	89	13.7	91	14.3	77	88	14.0
LCS Genie	92	13.7	87	13.2	82	14.2	73	83	13.7
ND Genesis	94	12.5	92	12.5	93	12.8	73	88	12.6
Pinnacle	96	13.6	93	12.0	96	13.0	73	89	12.9
Sirish	96	14.2	91	13.2	92	14.7	75	88	14.0
Mean	94	14.0	89	14.0	90	14.1	75	87	14.3
CV %	1.4	3.9	1.8	3.6	3.0	3.0	2.7	2.9	3.5
LSD 0.05	2.0	0.9	2.3	0.7	5	0.7	3.3	3.7	0.8
LSD 0.10	2.0	0.7	1.9	0.6	4	0.6	2.8	3	0.7

Table 6. 2018 North Dakota oat variety descriptions.

							Reaction to Diseases				
Variety	Origin[1]	Year Released	Grain Color	Height	Straw Strength	Maturity[2]	Stem Rust[3]	Crown Rust[3]	Barley Y.Dwf[4]	Bu/Wt.	Protein[5]
AC Pinnacle	AAFC	1999	White	Tall	Med.	L	8	8	8	V.good	L
Beach	ND	2004	White	Tall	M.strg.	M/L	8	4	6	V.good	M
CDC Dancer	Sask.	2000	White	Tall	Strong	L	8	6	8	V.good	M
CDC Minstrel	Sask.	2006	White	Tall	M.strg.	L	8	8	8	Good	M
CS Camden	Canterra	2016	White	Med.	Strong	M	8	6	NA	Good	NA
Deon	MN	2013	Yellow	Tall	Strong	L	8	1	2	V.good	NA
Hayden	SD	2014	White	Tall	Med.	L	8	7	NA	V.good	NA
HiFi	ND	2001	White	Tall	Strong	L	4	8	2	Good	M
Hytest	SD	1986	White	Tall	M.strg.	E	8	6	8	V.good	H
Jury	ND	2012	White	Tall	M.strg.	M	1	8	4	V.good	M
Killdeer	ND	2000	White	Med.	Strong	M	8	6	4	Good	M
Leggett	AAFC	2005	White	Tall	Strong	L	3	1	8	Good	M
Newburg	ND	2011	White	Tall	Med.	L	1	8	4	Good	M
Otana	MT	1977	White	M.tall	M.weak	L	8	8	8	V.good	M/L
Paul[6]	ND	1994	Hull-less	V.tall	Strong	L	1	4	2	Good	H
Rockford	ND	2008	White	Tall	Strong	L	8	8	4	V.good	M
Souris	ND	2006	White	Med.	Strong	M	6	8	6	V.good	M
Stallion	SD	2006	White	Tall	Med.	L	8	3	NA	V.good	M

[1]AAFC = Agriculture & Agri-Food Canada; MN = University of Minnesota; ND = North Dakota State University; SD = South Dakota State University; Sask. = University of Saskatchewan; MT = Montana State University.

[2]E = early; M = medium; L = late.

[3]Disease reaction scores from 1-9, with 1 = resistant and 9 = very susceptible.

[4]Disease reaction scores from 1-9, with 1 = resistant and 9 = very susceptible, NA – not available.

[5]H = high; M = medium; L = low; NA = not available.

[6]Hull-less variety.

Table 7. Yield and test weight of oat varieties at three locations in eastern North Dakota, 2016-2018.

	Edgeley			Carrington			Langdon			Average Eastern N.D.		
	Test	Yield		Test	Yield		Test	Yield		Test	Yield	
Variety	Wt.	2018	3 Yr.	Wt.	2018	3 Yr.	Wt.	2018	3 Yr.	Wt.	2018	3 Yr.
	(lb/bu)	-----(bu/a)-----		(lb/bu)	-----(bu/a)-----		(lb/bu)	-----(bu/a)-----		(lb/bu)	-----(bu/a)-----	
AC Pinnacle	39.8	113.8	127.2	37.1	148.8	129.1	40.9	183.7	175.3	39.2	148.8	143.8
Beach	42.5	109.1	131.2	37.3	127.8	121.6	41.6	164.1	170.3	40.5	133.7	141.0
CDC Dancer	42.3	117.6	135.3	36.2	147.7	129.7	41.0	182.2	168.7	39.8	149.2	144.5
CDC Minstrel	39.1	129.2	123.6	35.5	140.8	125.8	40.2	181.0	181.7	38.2	150.3	143.7
CS Camden	37.5	149.0	--	35.5	149.5	--	38.7	208.3	203.8	37.2	169.0	--
Deon	40.3	135.4	138.3	37.6	149.5	134.5	40.4	181.7	182.3	39.4	155.5	151.7
Hayden	41.1	117.0	128.0	37.1	142.0	--	41.2	168.7	165.7	39.8	142.6	--
HiFi	39.3	110.4	122.7	36.6	140.2	116.4	40.8	179.1	169.7	38.9	143.2	136.3
Hytest	43.1	98.8	105.9	38.1	136.9	115.9	42.5	139.0	127.7	41.2	124.9	116.5
Jury	39.6	139.1	131.1	36.9	142.2	118.2	40.3	207.6	170.5	38.9	163.0	139.9
Killdeer	38.3	113.4	--	36.2	149.4	128.2	39.8	191.8	179.3	38.1	151.5	--
Leggett	40.2	126.6	116.3	37.1	135.6	117.7	41.2	195.4	182.2	39.5	152.5	138.8
Newburg	38.8	110.3	127.4	36.6	141.9	112.3	40.0	178.0	165.4	38.5	143.4	135.0
Otana	37.8	90.0	106.9	37.0	154.5	118.6	41.0	191.7	159.0	38.6	145.4	128.2
Paul[1]	46.3	92.6	87.9	43.0	105.6	72.6	47.4	148.5	137.4	45.6	115.6	99.3
Rockford	40.7	106.4	118.9	38.0	140.8	124.2	41.7	177.8	164.7	40.1	141.7	135.9
Souris	37.7	109.2	122.6	36.8	146.6	122.9	39.9	165.2	163.5	38.1	140.3	136.4
Stallion	40.6	110.7	113.8	36.6	152.0	127.1	42.1	183.2	152.8	39.8	148.7	131.2
Mean	40.6	119.8	121.1	37.2	139.7	119.7	41.0	181.2	167.8	39.6	145.6	134.8
CV %	2.4	11.0	--	3.2	13.3	--	1.1	5.8	--	2.0	7.2	--
LSD 0.05	1.6	21.2	--	1.7	26.2	--	0.7	17.2	--	1.3	17.4	--
LSD 0.10	1.3	17.6	--	1.4	21.8	--	0.6	14.3	--	1.1	14.5	--

[1]Hull-less varieties. When comparing yield of hull-less oat varieties with varieties with hulls, multiply the yield of the hull-less oats by 1.35 (the hull of a hulled kernel comprises 35 percent of the weight).

Table 8. Yield and test weight of oat varieties at four locations in western North Dakota, 2016-2018.

	Dickinson			Hettinger			Minot			Williston			Average Western N.D.		
	Test	Yield		Test	Yield		Test	Yield		Test	Yield		Test	Yield	
Variety	Wt.	2018	3 Yr.	Wt.	2018	3 Yr.	Wt.	2018	3 Yr.	Wt.	2018	3 Yr.	Wt.	2018	3 Yr.
	(lb/bu)	----(bu/a)----		(lb/bu)	----(bu/a)----		(lb/bu)	----(bu/a)----		(lb/bu)	----(bu/a)----		(lb/bu)	----(bu/a)----	
AC Pinnacle	35.6	116.2	116.6	34.6	95.5	84.1	39.1	136.1	143.9	43.9	83.7	86.6	38.3	107.9	107.8
Beach	37.1	83.5	94.9	37.3	90.9	67.1	41.2	150.8	145.1	44.4	83.4	75.3	40.0	102.2	95.6
CDC Dancer	37.0	95.3	101.6	34.6	98.9	77.9	37.7	134.6	133.8	43.8	81.9	83.1	38.3	102.7	99.1
CDC Minstrel	34.5	106.0	103.4	34.9	99.6	77.4	36.6	120.3	141.1	42.6	75.1	81.7	37.1	100.3	100.9
CS Camden	33.6	111.4	--	34.3	114.1	--	36.5	137.7	--	40.9	77.3	--	36.3	110.1	--
Deon	36.8	95.5	99.5	35.6	89.8	74.9	38.7	125.6	142.2	42.5	80.5	77.9	38.4	97.9	98.6
Hayden	39.1	117.4	113.0	36.0	105.2	83.2	40.5	143.7	151.8	43.7	71.9	--	39.8	109.6	--
HiFi	37.9	109.4	100.8	35.3	94.1	71.1	38.3	117.6	139.8	43.5	78.2	77.4	38.7	99.8	97.3
Hytest	39.9	101.6	92.0	37.1	84.3	67.2	40.2	133.3	133.5	43.6	57.9	61.6	40.2	94.3	88.6
Jury	36.9	95.2	93.2	36.2	92.3	68.6	39.2	111.3	125.2	43.6	87.1	78.2	39.0	96.5	91.3
Killdeer	35.9	109.3	105.5	36.0	108.3	76.0	39.0	115.3	125.1	43.2	78.3	85.9	38.5	102.8	98.1
Leggett	36.4	95.4	99.9	34.3	99.7	75.6	37.2	142.1	137.2	43.2	82.7	83.4	37.8	105.0	99.0
Newburg	34.9	82.1	90.4	34.1	95.6	72.3	40.7	92.7	120.0	43.0	85.4	78.3	38.2	88.9	90.3
Otana	35.0	97.7	100.1	36.6	97.1	76.0	40.4	113.4	128.7	42.4	79.8	78.2	38.6	97.0	95.8
Paul[1]	40.9	82.2	72.5	40.7	72.7	52.7	45.4	103.3	101.7	50.9	55.3	53.6	44.5	78.4	70.1
Rockford	38.5	99.1	101.2	37.1	112.3	84.6	39.3	132.4	126.7	42.8	71.4	78.2	39.4	103.8	97.7
Souris	36.6	94.5	94.7	36.2	103.6	80.6	38.7	112.3	133.1	42.1	72.5	76.9	38.4	95.7	96.3
Stallion	33.5	103.6	101.7	37.3	96.5	71.4	37.8	130.9	130.7	43.5	84.0	75.5	38.0	103.7	94.8
Mean	36.6	100.7	98.9	35.8	97.3	73.5	38.9	125.4	132.9	43.9	73.1	77.0	38.9	99.8	95.1
CV %	2.5	13.7	--	1.2	6.0	--	1.9	11.9	--	1.4	11.6	--	2.8	9.9	--
LSD 0.05	1.3	19.3	--	0.6	8.2	--	1.2	24.1	--	1.0	13.8	--	1.5	14.0	--
LSD 0.10	1.1	16.1	--	0.5	6.9	--	1.0	20.4	--	0.8	11.5	--	1.3	11.7	--

[1]Hull-less varieties. When comparing yield of hull-less oat varieties with varieties with hulls, multiply the yield of the hull-less oats by 1.35 (the hull of a hulled kernel is 35 percent of the weight).

Table 9. 2018 North Dakota winter rye variety descriptions.

Variety	Origin[1]	Year Released	Height (inches)	Straw Strength	Days to Flowering	Seed Color	Seed Size	Test Weight	Winter Hardiness
AC Hazlet	Canada	2006	47	Good	152	Bl-grn.	Small	High	Good
Aroostok	USDA	1981	48	Fair	148	NA[2]	Small	High	V.good
Brasetto	KWS Germany	2008	45	V.good	150	NA	Large	High	Good
Dacold	ND	1989	47	Good[3]	150	Bl-grn.	Med.	Low	Good
Hancock	WI	1979	47	Good	151	Tan	Large	High	Fair[4]
ND Dylan	ND	2016	49	Good	147	Blue	Med.	High	V. good
Rymin	MN	1973	42	V.good	151	Grn-gray	Large	High	Fair[4]
Spooner	WI	1993	49	V.good	151	Tan	Large	High	Good
Wheeler	MI	1971	47	Fair	152	NA	Large	Low	Good

[1]ND = North Dakota State University; WI = University of Wisconsin; MN = University of Minnesota; MI = Michigan State University.

[2]NA = not available.

[3]Under certain environments, lodging has been observed.

[4]Varieties with fair winter hardiness should not be seeded in bare soil.

Table 10. Yield and test weight of winter rye varieties at five locations in North Dakota, 2016-2018.

	Carrington			Carrington (organic)			Hettinger			Langdon			Minot			Average		
	Test	Seed Yield		Test	Seed Yield		Test	Seed Yield		Test	Seed Yield		Test	Seed Yield		Test	Seed Yield	
Variety	Wt.	2018	3-yr.	Wt.	2018	2-yr.	Wt.	2018	3-Yr.	Wt.	2018	3-Yr.	Wt.	2018	3-yr.	Wt.	2018	2/3-yr.[1]
	(lb/bu)	---(bu/a)---		(lb/bu)	---(bu/a)---		(lb/bu)	---(bu/a)---		(lb/bu)	---(bu/a)---		(lb/bu)	---(bu/a)---		(lb/bu)	---(bu/a)---	
AC Hazlet	51.9	55.1	58.1	54.4	76.0	77.6	47.7	40.2	--	56.7	65.7	--	48.5	57.1	--	51.9	58.8	--
Aroostok	50.0	29.1	36.4	52.5	47.0	46.4	48.1	27.6	42.1	54.6	49.7	54.6	46.3	27.9	42.6	50.3	36.3	44.4
Brasetto	48.8	58.8	--	52.5	85.5	84.0	50.3	58.6	--	54.7	88.7	--	46.9	59.1	--	50.6	70.1	--
Dacold	48.4	52.9	54.6	51.8	66.8	69.8	45.1	37.6	62.4	53.9	65.0	72.3	46.8	42.6	60.7	49.2	53.0	63.9
Hancock	51.1	44.1	51.6	53.4	66.6	68.8	44.6	29.7	51.9	55.2	56.4	70.2	47.8	45.4	64.4	50.4	48.4	61.4
ND Dylan	51.0	60.2	62.5	53.4	71.3	73.0	45.8	21.6	53.6	55.5	70.7	83.2	47.6	45.5	71.1	50.7	53.8	68.7
Rymin	52.2	61.2	61.1	54.7	74.7	79.2	48.4	39.6	62.4	56.8	72.8	76.1	48.9	55.6	70.0	52.2	60.8	69.8
Spooner	49.7	36.6	46.4	52.5	55.4	58.3	46.7	32.6	50.4	55.1	54.4	64.0	47.7	35.7	57.5	50.3	42.9	55.3
Wheeler	46.3	18.0	17.3	46.9	22.4	23.1	47.8	25.6	--	52.3	39.8	--	47.1	23.1	--	48.1	25.8	--
Mean	50.0	46.3	48.5	52.5	62.9	64.5	47.1	34.2	53.8	54.9	61.9	70.1	47.5	43.2	61.1	50.4	50.0	60.6
CV %	0.9	11.7	--	0.9	5.5	--	3.2	15.3	--	0.9	7.8	--	1.9	7.8	--	2.6	13.4	--
LSD 0.05	0.7	7.8	--	0.7	5.0	--	1.8	7.6	--	0.7	7.0	--	NS	5.8	--	1.7	8.6	--
LSD 0.10	0.6	6.5	--	0.6	4.2	--	1.5	6.3	--	0.6	5.8	--	1.2	4.8	--	1.4	7.2	--

[1]3-yr. average for Carrington, Hettinger, Langdon and Minot.

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