

North Dakota

Barley, Oat and Rye

Variety Trial Results for 2017 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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Table 1. 2017 North Dakota barley variety descriptions.

Variety	Use ¹	Origin ²	Year Released	Awn Type ³	Rachilla Hair Length ⁴	Aleurone Color	Height (inch)	Days to Head	Straw Strength	Reaction to Disease ⁵			
										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	NA	NA
ABI Growler	M/F	BARI	2014	R	L	White	25	68	M.strg.	NA	7	NA	NA
CDC Meredith	M	Canada	2008	R	L	White	25	65	Med.	4	4	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	60	M.strg.	NA	NA	NA	NA
LCS Genie	M	Limagrain	NA	S	S	White	23	65	V.strg.	NA	6	NA	NA
LCS Odyssey	M/F	Limagrain	NA	R	S	White	23	65	Med.	NA	6	4	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	NA	NA

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, 2015-2017.

Variety	Fargo			Carrington			Langdon			Average Eastern N.D.		
	Test Wt.	Yield		Test Wt.	Yield		Test Wt.	Yield		Test Wt.	Yield	
		2017	3 Yr.*		2017	3 Yr.		2017	3 Yr.		2017	3 Yr.
(lb/bu)	----(bu/a)----		(lb/bu)	----(bu/a)----		(lb/bu)	----(bu/a)----		(lb/bu)	----(bu/a)----		
Six-rowed												
Celebration	48.2	104.7	75.5	45.8	95.0	83.4	47.7	127.7	122.7	46.8	111.4	103.1
Innovation	48.6	116.0	79.7	47.2	93.9	77.7	48.6	121.0	120.5	47.9	107.5	99.1
Lacey	47.5	97.7	74.4	48.0	98.5	80.4	49.4	134.5	126.2	48.7	116.5	103.3
Quest	48.3	103.8	69.5	46.9	102.2	78.3	47.2	114.7	115.2	47.1	108.5	96.8
Stellar-ND	47.6	101.5	72.5	46.7	104.4	79.9	48.8	131.3	121.5	47.8	117.9	100.7
Tradition	49.0	109.8	80.6	48.6	99.5	79.1	48.8	122.4	120.4	48.7	111.0	99.8
Two-rowed												
AAC Synergy	49.3	112.5	--	48.9	117.4	--	49.5	131.1	--	49.2	124.3	--
ABI Balster	49.5	111.3	--	47.1	110.7	--	46.4	117.4	--	46.8	114.1	--
ABI Growler	48.3	111.0	--	45.2	95.7	--	45.7	118.0	--	45.5	106.9	--
CDC Meredith	--	--	--	44.7	105.3	87.5	46.9	113.9	106.7	--	--	--
Conlon ¹	49.7	98.9	62.2	49.9	86.5	75.4	51.3	77.3	88.2	50.6	81.9	81.8
Explorer	49.5	106.1	--	46.4	105.9	--	47.7	130.6	--	47.1	118.3	--
LCS Genie	50.0	103.1	--	47.4	100.7	--	47.9	116.2	--	47.7	108.5	--
LCS Odyssey	50.4	111.4	--	46.4	100.5	--	47.3	128.7	--	46.9	114.6	--
ND Genesis	50.0	114.9	82.8	48.7	103.4	--	49.1	129.4	119.8	48.9	116.4	--
Pinnacle	49.8	99.3	69.1	47.9	101.5	81.5	50.8	132.5	123.4	49.4	117.0	102.5
Sirish	50.7	110.4	--	47.1	95.5	--	48.7	126.4	--	47.9	111.0	--
Mean	48.9	107.0	74.0	47.2	101.0	80.4	48.3	121.9	116.5	47.8	111.5	100.4
CV %	--	5.9	--	1.8	6.9	--	1.7	6.3	--	1.9	7.2	--
LSD 0.05	--	8.5	--	1.2	10.2	--	1.2	11.1	--	1.6	13.3	--
LSD 0.10	--	6.6	--	1.0	8.5	--	1.0	9.3	--	1.3	11.1	--

*3-yr data is 2013, 2015, 2017.

¹Conlon suffered damage from rodents in 2016 and 2017.

Table 3. Plump and protein of barley varieties at three locations in eastern North Dakota, 2017.

Variety	Fargo		Carrington		Langdon		Average Eastern N.D.	
	Plump	Protein	Plump	Protein	Plump	Protein	Plump	Protein
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Six-rowed								
Celebration	95.8	13.9	81.6	14.7	90.8	13.7	86.2	14.2
Innovation	95.8	13.0	82.4	13.4	92.5	13.5	87.5	13.5
Lacey	98.1	13.1	87.4	12.9	93.9	12.7	90.7	12.8
Quest	95.6	12.9	77.7	13.6	82.0	13.5	79.9	13.6
Stellar-ND	98.0	12.8	85.9	12.3	97.3	12.5	91.6	12.4
Tradition	96.4	12.8	89.3	12.9	93.5	12.9	91.4	12.9
Two-rowed								
AAC Synergy	97.9	11.2	92.5	12.9	93.6	11.9	93.1	12.4
ABI Balster	95.4	11.0	84.9	13.5	84.7	12.4	84.8	13.0
ABI Growler	95.1	11.6	83.5	14.5	81.8	13.1	82.7	13.8
CDC Meredith	--	--	83.0	13.6	89.3	12.3	--	--
Conlon ¹	96.9	12.1	91.0	13.0	96.6	13.7	93.8	13.4
Explorer	94.7	11.1	80.7	13.1	90.7	11.5	85.7	12.3
LCS Genie	93.6	11.1	84.5	13.1	93.0	11.0	88.8	12.1
LCS Odyssey	97.1	11.2	92.5	13.1	94.5	10.7	93.5	11.9
ND Genesis	97.3	10.9	88.1	11.8	96.4	11.3	92.3	11.6
Pinnacle	94.2	10.4	92.9	11.3	98.4	12.0	95.7	11.7
Sirish	97.3	11.8	90.2	13.4	94.9	11.9	92.6	12.7
Mean	96.2	11.9	85.8	13.0	92.6	12.3	89.2	12.8
CV %	--	--	4.8	4.9	3.4	4.6	3.3	5.0
LSD 0.05	--	--	5.9	1.1	4.4	0.8	5.1	1.0
LSD 0.10	--	--	4.9	0.9	3.7	0.7	4.2	0.8

¹Conlon suffered damage from rodents in 2016 and 2017.

Table 4. Yield and test weight of barley varieties at four locations in western North Dakota, 2015-2017.

Variety	<u>Dickinson</u>			<u>Hettinger</u>			<u>Minot</u>			<u>Williston</u>			<u>Average Western N.D.</u>		
	Test	Yield		Test	Yield		Test	Yield		Test	Yield		Test	Yield	
	Wt.	2017	3 Yr.	Wt.	2017	3 Yr.	Wt.	2017	3 Yr.	Wt.	2017	3 Yr.	Wt.	2017	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	46.3	49.2	75.3	43.6	47.9	61.9	46.2	60.0	78.8	44.4	60.0	62.2	45.1	54.3	69.6
Innovation	49.8	50.0	75.3	44.5	40.4	63.2	48.4	60.3	80.3	45.3	53.8	57.9	47.0	51.1	69.2
Lacey	48.3	45.6	77.0	44.5	49.9	64.6	48.7	64.0	78.6	44.2	56.9	59.0	46.4	54.1	69.8
Quest	48.3	47.3	71.2	43.3	52.1	60.9	48.7	74.4	83.4	46.2	48.4	57.9	46.6	55.6	68.4
Stellar-ND	46.5	46.7	76.6	42.2	47.5	65.5	47.4	62.2	77.9	44.4	59.2	58.2	45.1	53.9	69.6
Tradition	50.0	45.6	65.5	44.7	46.3	64.5	48.6	68.6	77.0	46.8	56.3	60.9	47.5	54.2	67.0
Two-rowed															
AAC Synergy	47.5	47.4	--	43.5	41.8	--	48.2	69.2	--	43.0	57.3	--	45.6	53.9	--
ABI Balster	46.3	47.8	--	43.4	53.0	--	48.6	79.6	--	42.7	57.2	--	45.3	59.4	--
ABI Growler	44.5	46.3	--	41.9	34.7	--	46.7	70.8	--	41.2	53.2	--	43.6	51.3	--
CDC Meredith	44.5	44.2	88.4	37.7	41.6	73.3	46.5	73.7	93.5	40.9	50.4	59.3	42.4	52.5	78.6
Conlon	50.5	45.8	67.8	43.1	24.2	55.7	49.3	72.0	86.8	48.9	44.2	50.5	48.0	46.6	65.2
Explorer	49.5	54.1	--	44.3	57.8	--	49.1	72.6	--	46.2	57.3	--	47.3	60.5	--
LCS Genie	48.5	46.2	--	45.9	53.7	--	49.2	82.7	--	45.7	61.6	--	47.3	61.1	--
LCS Odyssey	46.8	52.7	--	46.4	47.1	--	47.3	71.3	--	46.3	59.1	--	46.7	57.6	--
ND Genesis	48.8	49.3	87.5	43.7	40.0	70.7	49.4	77.6	98.9	45.8	59.1	59.5	46.9	56.5	79.2
Pinnacle	50.0	45.7	84.1	43.1	49.4	72.5	50.2	72.4	85.6	46.5	52.4	65.6	47.5	55.0	77.0
Sirish	48.3	45.3	--	45.6	48.6	--	48.0	77.7	--	45.9	55.8	--	47.0	56.9	--
Mean	48.3	48.8	77.7	43.6	45.6	65.3	48.4	70.8	84.1	45.1	55.8	59.5	46.2	54.9	71.3
CV %	1.5	9.7	--	4.2	15.0	--	1.6	7.6	--	3.0	10.2	--	3.0	9.9	--
LSD 0.05	1.5	6.7	--	2.6	9.6	--	1.2	8.8	--	0.8	9.6	--	2.0	7.8	--
LSD 0.10	1.3	5.6	--	2.1	8.0	--	1.0	7.4	--	0.7	8.0	--	1.7	6.5	--

Table 5. Plump and protein of barley varieties at four locations in western North Dakota, 2017.

Variety	<u>Dickinson</u>		<u>Hettinger</u>		<u>Minot</u>		<u>Williston</u>		<u>Average Western N.D.</u>	
	Plump	Protein	Plump	Protein	Plump	Protein	Plump	Protein	Plump	Protein
	------(%)-----									
Six-rowed										
Celebration	50	17.7	80	12.4	83	12.9	53.4	16.9	66.6	15.0
Innovation	74	17.5	78	12.1	88	13.1	67.9	17.2	77.0	15.0
Lacey	53	16.8	75	11.5	86	13.3	57.3	17.1	67.8	14.7
Quest	50	17.1	76	11.6	79	14.0	62.7	16.5	66.9	14.8
Stellar-ND	52	15.7	74	11.6	88	13.1	67.6	16.7	70.4	14.3
Tradition	59	16.9	77	11.8	88	13.0	68.5	15.7	73.1	14.4
Two-Rowed										
AAC Synergy	56	16.1	79	10.7	96	12.9	58.6	16.8	72.4	14.1
ABI Balster	46	15.8	73	12.3	93	12.7	43.4	17.0	63.9	14.5
ABI Growler	45	17.9	69	12.9	94	13.1	37.4	17.8	61.4	15.4
CDC Meredith	45	16.7	62	11.9	88	12.9	26.6	17.3	55.4	14.7
Conlon	86	15.5	85	11.3	96	12.9	89.5	16.0	89.1	13.9
Explorer	62	15.4	82	11.1	88	12.6	68.8	16.1	75.2	13.8
LCS Genie	53	15.9	76	10.9	94	11.9	51.1	16.0	68.5	13.7
LCS Odyssey	69	16.4	82	10.5	95	11.9	53.3	17.0	74.8	14.0
ND Genesis	71	14.6	80	11.2	97	11.3	70.6	14.7	9.7	13.0
Pinnacle	81	15.5	79	11.5	97	12.0	68.3	16.0	81.3	13.8
Sirish	46	16.9	75	11.3	90	13.1	52.4	17.4	65.9	14.7
Mean	59	16.4	77	11.6	91	12.7	58.7	16.6	71.1	14.3
CV %	10.0	2.9	5.2	6.3	2.7	5.7	16.8	1.3	11.6	3.8
LSD 0.05	13.0	0.9	5.7	1.0	4.0	1.2	17.4	1.0	12.0	0.8
LSD 0.10	11.0	0.8	4.8	0.9	3.0	1.0	14.5	0.8	10.0	0.6

Table 6. 2017 North Dakota oat variety descriptions.

Variety	Origin ¹	Year Released	Grain Color	Straw Height	Straw Strength	Maturity ²	Reaction to Diseases			Bu/Wt.	Protein ⁵
							Stem Rust ³	Crown Rust ³	Barley Y.Dwf ⁴		
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	M
Deon	MN	2013	Yellow	Tall	Strong	L	8	1	2	V.good	M
Hayden	SD	2014	White	Tall	Med.	L	8	7	NA	V.good	M
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	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

¹AAFC = 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.

²E = early; M = medium; L = late.

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

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

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

Table 7. Yield and test weight of oat varieties at three locations in eastern North Dakota, 2015-2017.

Variety	<u>Edgeley</u>			<u>Carrington</u>			<u>Langdon</u>			<u>Average Eastern N.D.</u>		
	<u>Test</u>	<u>Yield</u>		<u>Test</u>	<u>Yield</u>		<u>Test</u>	<u>Yield</u>		<u>Test</u>	<u>Yield</u>	
	Wt.	2017	3 Yr.	Wt.	2017	3 Yr.	Wt.	2017	3 Yr.	Wt.	2017	3 Yr.
	(lb/bu)	----(bu/a)----		(lb/bu)	----(bu/a)----		(lb/bu)	----(bu/a)----		(lb/bu)	----(bu/a)----	
AC Pinnacle	38.9	86.4	152	35.2	97.8	108.2	37.6	191.1	173.2	37.2	125.1	144.5
Beach	40.5	109.9	146	37.5	90.1	106.0	41.2	200.6	173.6	39.7	133.5	141.9
CDC Dancer	41.2	116.2	147	35.8	111.6	101.7	39.5	192.3	166.7	38.8	140.0	138.5
CDC Minstrel	39.9	72.7	139	34.8	98.9	107.1	37.7	218.7	174.6	37.5	130.1	140.2
CS Camden	37.9	100.4	--	34.2	99.8	--	37.5	229.1	--	36.5	143.1	--
Deon	38.4	96.0	148	35.9	107.3	--	39.9	203.5	183.8	38.1	135.6	--
Hayden	41.2	93.9	151	37.5	102.4	--	43.2	194.6	--	40.6	130.3	--
HiFi	39.3	93.7	143	35.7	84.7	98.2	40.9	190.6	163.1	38.6	123.0	134.8
Hyttest	41.3	84.9	117	35.9	103.7	95.1	41.5	141.8	127.8	39.6	110.1	113.3
Jury	39.6	94.8	137	36.6	102.2	97.9	41.0	176.0	151.7	39.1	124.3	128.9
Killdeer	--	--	--	34.3	98.9	106.6	38.6	191.9	169.1	--	--	--
Leggett	40.6	69.2	124	36.6	83.5	97.9	40.7	194.3	180.4	39.3	115.7	134.1
Newburg	40.4	99.3	141	35.8	89.9	93.4	40.0	178.8	160.0	38.7	122.7	131.5
Otana	40.4	87.6	126	36.0	88.6	96.7	37.9	185.3	140.2	38.1	120.5	121.0
Paul ¹	43.0	52.3	101	43.6	52.0	--	46.2	165.2	130.4	44.3	89.8	--
Rockford	41.6	87.2	139	37.8	99.3	105.8	42.5	191.5	155.0	40.6	126.0	133.3
Souris	39.9	90.3	137	36.2	85.0	101.5	39.9	189.2	154.4	38.7	121.5	131.0
Stallion	39.5	75.1	127	35.7	98.1	105.3	40.9	168.7	145.2	38.7	114.0	125.8
Mean	40.2	88.8	136	36.4	94.1	101.5	40.4	189.1	159.3	39.1	123.8	132.2
CV %	4.1	19.7	--	1.9	11.6	--	2.4	6.6	--	2.0	8.8	--
LSD 0.05	2.6	27.7	--	1.0	17.4	--	1.3	17.2	--	1.1	15.5	--
LSD 0.10	NS	NS	--	0.8	14.5	--	1.1	14.4	--	0.9	12.9	--

¹Hull-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, 2015-2017.

Variety	<u>Dickinson</u>			<u>Hettinger</u>			<u>Minot</u>			<u>Williston</u>			<u>Average Western N.D.</u>		
	Test	Yield		Test	Yield		Test	Yield		Test	Yield		Test	Yield	
	Wt.	2017	3 Yr.	Wt.	2017	3 Yr.	Wt.	2017	3 Yr.	Wt.	2017	3 Yr.	Wt.	2017	3 Yr.
	(lb/bu)	----(bu/a)----		(lb/bu)	----(bu/a)----		(lb/bu)	----(bu/a)----		(lb/bu)	----(bu/a)----		(lb/bu)	----(bu/a)----	
AC Pinnacle	32.6	83.4	131.8	34.2	79.5	112.4	38.7	144.7	145.0	36.3	72.9	79.8	35.5	95.1	117.3
Beach	34.8	70.3	105.6	34.1	50.9	91.8	40.3	140.1	144.5	38.8	56.4	65.0	37.0	79.4	101.7
CDC Dancer	32.8	74.4	117.0	35.7	72.4	104.1	36.1	126.6	136.6	37.2	66.3	79.8	35.5	84.9	109.4
CDC Minstrel	33.0	70.2	118.0	31.8	66.6	106.3	35.8	143.3	146.7	36.1	64.3	76.6	34.2	86.1	111.9
CS Camden	28.7	72.4	--	31.5	73.3	--	34.8	144.0	--	36.1	68.0	--	32.8	89.4	--
Deon	31.4	76.1	117.8	34.5	70.9	102.6	37.4	136.3	134.6	39.2	70.9	73.4	35.6	88.6	107.1
Hayden	33.6	80.9	--	35.8	75.4	--	40.2	151.0	--	38.5	71.8	--	37.0	94.8	--
HiFi	30.2	69.7	111.2	31.3	57.5	99.9	38.3	147.7	143.5	37.6	61.6	71.2	34.4	84.1	106.5
Hytest	33.9	66.0	94.4	36.0	63.5	87.3	39.2	122.9	128.7	39.4	49.8	60.0	37.1	75.6	92.6
Jury	31.2	73.2	106.1	34.7	58.0	96.4	38.3	127.8	127.6	39.5	66.0	70.2	35.9	81.3	100.1
Killdeer	33.3	81.8	119.0	35.0	58.2	102.2	37.4	130.9	126.8	36.1	67.5	81.6	35.5	84.6	107.4
Leggett	32.5	70.9	118.1	33.4	65.6	100.5	36.2	132.8	129.5	38.4	63.1	76.0	35.1	83.1	106.0
Newburg	30.5	73.2	110.7	33.1	57.5	101.0	38.6	119.7	125.2	38.4	64.9	70.4	35.2	78.8	101.8
Otana	31.8	76.5	110.0	34.3	67.2	95.7	38.3	136.3	127.5	34.7	68.7	72.3	34.8	87.2	101.4
Paul ¹	36.2	43.3	80.0	34.7	39.3	78.3	42.5	99.9	107.6	49.0	42.8	55.3	40.6	56.3	80.3
Rockford	33.9	71.2	116.2	35.4	76.2	109.3	39.2	119.0	118.5	38.3	62.8	72.7	36.7	82.3	104.2
Souris	32.4	78.2	111.6	34.3	74.2	102.6	38.6	141.4	128.4	37.0	65.1	73.7	35.6	89.7	104.1
Stallion	31.9	83.2	112.0	36.5	58.2	92.8	37.2	139.5	131.9	35.3	50.4	59.9	35.2	82.8	99.2
Mean	32.2	73.1	111.7	34.0	65.2	99.4	37.9	133.5	131.4	37.8	63.3	71.1	35.5	83.8	103.2
CV %	3.1	9.6	--	3.6	26.0	--	4.0	7.9	--	2.4	7.9	--	4.4	7.5	--
LSD 0.05	1.4	9.8	--	1.7	22.7	--	2.5	18.0	--	1.5	7.8	--	2.2	9.0	--
LSD 0.10	1.1	8.2	--	1.4	19.0	--	2.1	15.0	--	1.2	6.5	--	1.8	7.5	--

¹Hull-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. 2017 North Dakota winter rye variety descriptions.

Variety	Origin ¹	Year Released	Height	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

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

²NA = not available.

³Under certain environments, lodging has been observed.

⁴Varieties 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, 2015-2017.

Variety	Carrington			Carrington (organic)			Hettinger			Langdon			Minot			Average		
	Test Wt.	Seed Yield		Test Wt.	Seed Yield		Test Wt.	Seed Yield		Test Wt.	Seed Yield		Test Wt.	Seed Yield		Test Wt.	Seed Yield	
	(lb/bu)	2017	3-yr. Avg.	(lb/bu)	2017	2-yr. Avg.	(lb/bu)	2017	2-Yr. Avg.	(lb/bu)	2017	2-Yr. Avg.	(lb/bu)	2017	2-yr. Avg.	(lb/bu)	2017	2/3-yr Avg.
AC Hazlet	56.2	75.6	58.6	56.4	79.1	72.8	56.7	84.9	--	55.9	96.5	--	55.1	76.7	--	56.1	82.6	--
Aroostok	54.5	53.5	35.7	53.9	45.8	40.6	57.2	53.2	49.4	53.6	58.5	57.1	53.8	40.9	49.9	54.6	50.4	46.5
Brasetto	54.4	109.6	--	54.7	82.4	--	54.0	97.8	--	55.0	138.4	--	53.0	93.1	--	54.2	104.3	--
Dacold	52.9	74.7	55.2	53.8	72.7	67.7	54.2	76.6	74.8	52.4	75.3	75.9	52.5	58.8	69.7	53.2	71.6	68.7
Hancock	56	75.8	50.0	55.7	71.0	63.0	56.6	66.1	63.0	55.5	78.3	77.1	54.4	69.6	74.0	55.6	72.2	65.4
ND Dylan	55	86.8	60.8	55.2	74.8	67.8	55.6	74.5	69.6	54.7	94.8	89.4	53.6	72.6	83.9	54.8	80.7	74.3
Rymin	56.7	88.8	55.3	56.3	83.8	67.8	56.8	85.4	66.0	55.9	89.8	77.8	55.3	76.9	77.2	56.2	84.9	68.8
Spooner	55.1	69.1	45.1	55.0	61.3	56.5	57.6	61.4	--	55.4	70.2	68.8	54.0	57.5	68.4	55.4	63.9	--
Wheeler	49.4	18.1	27.5	51.6	23.7	27.2	54.3	50.8	--	51.7	51.6	--	50.2	41.0	--	51.4	37.0	--
Mean	54.6	72.2	48.5	54.7	66.1	57.9	56.0	70.0	64.6	54.5	83.7	74.4	53.5	65.2	70.5	54.6	72.0	64.7
CV %	0.9	9.3	--	0.7	12.8	--	0.9	6.7	--	1.3	12.7	--	12.0	8.4	--	1.3	11.0	--
LSD 0.05	0.7	9.6	--	0.5	11.9	--	0.7	6.8	--	1.0	15.1	--	1.1	9.1	--	0.9	10.7	--
LSD 0.10	0.6	8	--	0.4	9.9	--	0.6	5.6	--	0.9	12.6	--	0.9	7.5	--	0.7	8.9	--

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