

North Dakota

Barley, Oat and Rye

Variety Trial Results for 2016 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.

List of Tables

- Table 1. 2016 North Dakota barley variety descriptions.
- Table 2. Yield and test weight of barley varieties at two locations in eastern North Dakota, 2014-2016.
- Table 3. Plump and protein of barley varieties at two locations in eastern North Dakota, 2016.
- Table 4. Yield and test weight of barley varieties at four locations in western North Dakota, 2014-2016.
- Table 5. Plump and protein of barley varieties at four locations in western North Dakota, 2016.
- Table 6. 2016 North Dakota oat variety descriptions.
- Table 7. Yield and test weight of oat varieties at three locations in eastern North Dakota, 2014-2016.
- Table 8. Yield and test weight of oat varieties at four locations in western North Dakota, 2014-2016.
- Table 9. 2016 North Dakota winter rye variety descriptions.
- Table 10. Yield and test weight of winter rye varieties at three locations in North Dakota, 2014-2016.

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Table 1. 2016 North Dakota barley variety descriptions.

Variety	Use ¹	Origin ²	Year Released	Awn Type ³	Rachilla Hair Length ⁴	Aleurone Color	Height	Straw Strength	Relative Maturity	Reaction to Disease ⁵			
										Stem Rust	Spot-form Net Blotch	Spot Blotch	Net Blotch
Six-rowed													
Celebration	M/F	BARI	2008	S	S	White	M.short	Strg.	Med.	S	MS	MR/R	MS/S
Drummond	M/F	ND	2000	S	L	White	M.short	V.strg.	Med.	S	MR	MR/R	MS/S
Innovation	MT	BARI	2009	S	L	White	M.short	Strg.	Med.	S	MS	MR/R	MS/S
Lacey	M/F	MN	1999	S	S	White	M.short	Strg.	Med.	S	MR	MR/R	MS/S
Legacy	M/F	BARI	2000	S	L	White	Med.	Strg.	M.late	S	MS	MR/R	MS/S
Quest ⁶	M/F	MN	2010	S	L	White	M.short	V.strg.	Med.	S	MR	MR/R	MS/S
Rasmusson	M/F	MN	2008	S	S	White	M.short	Strg.	Med.	S	MS	MR/R	MS/S
Robust	F	MN	1983	S	S	White	Med.	M.strg.	Med.	S	MS/S	MR/R	MS/S
Stellar-ND	M/F	ND	2005	S	L	White	M.short	V.strg.	Med.	S	MS	MR/R	MS/S
Tradition	M/F	BARI	2003	S	L	White	M.short	V.strg.	Med.	S	MS	MR/R	MS/S
Two-rowed													
AAC Synergy	M/F	Syngenta	2015	R	L	White	M.short	Strg.	M.late	MR	MR/R	MR	MR
ABI Balster	M/F	BARI	2015	R	L	White	M.short	Med.	Med.	NA	MR	NA	NA
ABI Growler	M/F	BARI	2015	R	L	White	M.short	M.strg.	Med.	NA	MS/S	NA	NA
AC Metcalfe	M	Canada	1997	R	L	White	Med.	Med.	Late	S	MS	MS	S
CDC Copeland	M	Canada	1999	R	L	White	Tall	Med.	Late	S	MS	MS	MR
CDC Meredith	M	Canada	2008	R	L	White	Med.	Med.	Late	MR	MR	S	MS
Conlon ⁷	M/F	ND	1996	S	L	White	M.short	Med.	M.early	S	MR	MS	MR/R
Conrad	M	BARI	2007	R	L	White	Tall	M.weak	Late	S	MS	NA	NA
Eslick	F	MT	2003	R	L	White	Med.	M.weak	M.late	S	NA	MS	NA
Harrington ⁸	F	Canada	1981	R	L	White	Med.	M.weak	Late	S	S	S	MS
Haxby	F	MT	2003	R	L	White	Med.	Med.	Med.	S	MS	MS	NA
Hockett	M/F	MT	2008	R	L	White	Med.	Med.	Med.	S	NA	NA	NA
LCS Genie	M	Limagrain	NA	S	S	White	Short	V.strg.	Med.	NA	MS	NA	NA
LCS Odyssey	M/F	Limagrain	NA	R	S	White	Short	Med.	Med.	NA	MS	NA	NA
Lilly	F	Germany	NA	R	L	White	Short	M.strg.	Late	S	MS/S	S	MR/R
ND Genesis ⁹	M/F	ND	2015	S	L	White	Med.	M.strg.	M.late	S	MR	MR	MS
Pinnacle	M/F	ND	2006	S	L	White	Med.	Strg.	M.late	S	S	MR	MS
Rawson	F	ND	2005	R	L	White	Med.	Med.	Med.	S	MS	MR	MS
Scarlett	M	Germany	1995	R	L	White	Short	Med.	Late	S	NA	S	MR
Sunshine	F	Germany	NA	R	L	White	Short	M.strg.	Late	S	S	S	MS
Specialty													
Wanubet	SP	MT	1990	H	L	White	Med.	Weak	Late	S	NA	S	S

¹ M = malting; MT = being tested in plant-scale tests for malting and brewing quality; F = feed; SP = special uses (hull-less).² BARI = Busch Agricultural Resources Inc.; MN = University of Minnesota; MT = Montana State University; ND = North Dakota State University.³ R = rough; S = smooth; H = hull-less.⁴ S = short; L = long.⁵ R = resistant; MR = moderately resistant; MS = moderately susceptible; S = susceptible; NA = not available.⁶ Moderately resistant to Fusarium head blight.⁷ Lower DON accumulations than other varieties tested.⁸ Recommended as a malting barley in western U.S.

Table 2. Yield and test weight of barley varieties at two locations in eastern North Dakota, 2014-2016.

Variety	<u>Carrington</u>			<u>Langdon</u>			<u>Average Eastern N.D.</u>		
	Test	Yield		Test	Yield		Test	Yield	
	Wt.	2016	3 Yr.	Wt.	2016	3 Yr.	Wt.	2016	3 Yr.
	(lb/bu)	----(bu/a)----		(lb/bu)	----(bu/a)----		(lb/bu)	----(bu/a)----	
Six-rowed									
Celebration	46.2	57.1	95.5	47.1	110.5	128.1	46.7	83.8	111.8
Innovation	46.7	54.8	91.8	46.3	112.9	126.3	46.5	83.9	109.1
Lacey	47.1	56.6	90.6	46.9	115.9	126.0	47.0	86.3	108.3
Quest	47.1	48.1	86.6	45.9	107.2	120.2	46.5	77.7	103.4
Stellar-ND	46.1	54.8	89.6	48.8	104.0	119.3	47.5	79.4	104.5
Tradition	47.8	49.2	88.2	46.8	108.1	124.1	47.3	78.7	106.2
Two-rowed									
AAC Synergy	47.1	48.7	--	48.0	112.5	--	47.6	80.6	--
ABI Balster	46.2	55.8	--	43.7	91.8	--	45.0	73.8	--
ABI Growler	45.5	52.2	--	45.4	94.4	--	45.5	73.3	--
CDC Meredith	44.1	51.1	--	44.7	90.3	--	44.4	70.7	--
Conlon	50.2	52.8	91.1	49.7	76.4	104.4	50.0	64.6	97.8
LCS Genie	47.8	51.9	--	43.5	77.2	--	45.7	64.6	--
LCS Odyssey	47.7	53.1	--	39.9	70.8	--	43.8	62.0	--
ND Genesis	48.4	55.6	90.3	47.3	104.6	--	47.9	80.1	--
Pinnacle	47.4	55.7	91.5	47.9	105.8	125.3	47.7	80.8	108.4
Rawson	48.4	53.0	89.2	46.8	106.6	117.5	47.6	79.8	103.4
SY Sirish	48.7	53.2	--	44.1	87.5	--	46.4	70.4	--
Mean	47.7	52.6	90.5	46.4	100.3	121.2	47.1	76.5	105.9
CV %	1.7	10.8	--	2.6	6.4	--	3.8	13.1	--
LSD 0.05	1.2	NS	--	1.7	9.1	--	3.7	NS	--
LSD 0.10	1.0	NS	--	1.4	7.6	--	3.1	NS	--

Table 3. Plump and protein of barley varieties at two locations in eastern North Dakota, 2016.

Variety	<u>Carrington</u>		<u>Langdon</u>		<u>Average Eastern N.D.</u>	
	Plump	Protein	Plump	Protein	Plump	Protein
	(%)	(%)	(%)	(%)	(%)	(%)
Six-rowed						
Celebration	88.0	16.3	92.3	13.9	90.2	15.1
Innovation	86.3	16.4	91.0	13.5	88.7	15.0
Lacey	82.5	15.8	90.7	13.9	86.6	14.9
Quest	80.5	16.0	85.0	13.0	82.8	14.5
Stellar-ND	86.4	14.9	95.5	13.3	91.0	14.1
Tradition	83.5	15.8	88.7	13.9	86.1	14.9
Two-rowed						
AAC Synergy	88.9	15.4	94.3	11.9	91.6	13.7
ABI Balster	83.5	16.2	83.7	12.8	83.6	14.5
ABI Growler	88.2	16.6	83.9	12.4	86.1	14.5
CDC Meredith	75.1	15.7	85.8	12.2	80.5	14.0
Conlon	97.6	14.9	96.1	12.7	96.9	13.8
LCS Genie	92.2	15.9	82.9	12.4	87.6	14.2
LCS Odyssey	92.3	15.6	82.0	12.0	87.2	13.8
ND Genesis	92.5	14.2	96.2	10.9	94.4	12.6
Pinnacle	92.8	14.7	96.1	12.5	94.5	13.6
Rawson	97.0	13.9	96.9	12.2	97.0	13.1
SY Sirish	93.7	15.6	85.0	13.0	89.4	14.3
Mean	89.7	15.3	90.8	12.5	89.1	14.1
CV %	5.0	4.4	4.2	5.3	5.1	3.9
LSD 0.05	6.3	0.9	5.4	0.9	9.6	1.2
LSD 0.10	5.3	0.8	4.5	0.8	8.0	1.0

Table 4. Yield and test weight of barley varieties at four locations in western North Dakota, 2014-2016.

Variety	<u>Dickinson</u>			<u>Hettinger</u>			<u>Minot</u>			<u>Williston</u>			<u>Average Western N.D.</u>		
	Test	<u>Yield</u>		Test	<u>Yield</u>		Test	<u>Yield</u>		Test	<u>Yield</u>		Test	<u>Yield</u>	
	Wt.	2016	3 Yr.	Wt.	2016	3 Yr.	Wt.	2016	3 Yr.	Wt.	2016	3 Yr.	Wt.	2016	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	49.1	74.3	100.2	43.3	61.4	84.4	49.2	92.4	91.1	48.6	87.1	68.1	47.6	78.8	86.0
Innovation	50.8	77.8	103.8	44.4	62.1	90.5	50.5	94.0	90.3	47.4	73.9	61.5	48.3	77.0	86.5
Lacey	50.6	75.2	106.4	45.4	59.5	86.0	51.1	84.8	88.3	48.6	77.6	63.7	48.9	74.3	86.1
Quest	49.9	74.5	99.8	43.7	64.4	80.3	49.8	101.1	91.8	49.2	76.7	66.6	48.2	79.2	84.6
Stellar-ND	49.3	75.2	108.5	44.0	62.5	90.4	48.9	96.0	89.7	47.8	66.6	58.5	47.5	75.1	86.8
Tradition	51.1	69.5	97.2	46.5	63.3	89.1	50.3	89.0	83.4	48.6	77.9	68.0	49.1	74.9	84.4
Two-rowed															
AAC Synergy	50.9	90.3	--	44.7	75.7	--	50.2	114.5	--	48.9	81.8	--	48.7	90.6	--
ABI Balster	49.9	92.4	--	43.9	73.2	--	50.0	108.6	--	47.1	76.3	--	47.7	87.6	--
ABI Growler	49.1	86.9	--	43.4	68.0	--	49.7	103.8	--	49.2	75.2	--	47.9	83.5	--
CDC Meredith	49.5	94.9	--	41.9	68.2	--	49.2	110.2	--	48.3	82.1	--	47.2	88.9	--
Conlon	51.5	54.2	88.1	46.5	60.4	87.1	52.1	93.5	94.1	49.5	71.4	61.9	49.9	69.9	82.8
LCS Genie	51.0	97.1	--	45.9	67.0	--	50.6	107.5	--	50.3	81.9	--	49.5	88.4	--
LCS Odyssey	50.4	92.7	--	43.2	70.7	--	49.7	126.1	--	49.5	75.9	--	48.2	91.4	--
ND Genesis	50.8	88.7	113.2	45.8	69.0	95.5	50.5	110.4	106.7	49.8	77.1	62.8	49.2	86.3	94.6
Pinnacle	52.5	80.3	112.3	47.8	64.6	94.4	51.7	104.7	92.9	50.6	83.3	71.8	50.7	83.2	92.9
Rawson	51.4	73.9	106.3	45.8	66.1	87.1	50.6	95.8	94.0	50.8	83.0	66.7	49.7	79.7	88.5
SY Sirish	51.9	91.4	--	45.8	71.4	--	50.9	118.4	--	49.9	78.1	--	49.6	89.8	--
Mean	50.6	81.7	103.6	44.8	66.3	88.5	50.3	103.0	92.2	49.1	78.0	65.0	48.7	82.3	87.3
CV %	0.9	9.2	--	1.5	7.5	--	1.0	7.4	--	1.7	6.6	--	1.4	7.7	--
LSD 0.05	0.7	10.6	--	1.0	7.2	--	0.8	12.7	--	1.2	7.4	--	1.0	9.0	--
LSD 0.10	0.6	8.8	--	0.8	6.0	--	0.7	10.6	--	1.0	6.2	--	0.8	7.5	--

Table 5. Plump and protein of barley varieties at four locations in western North Dakota, 2016.

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	98.3	15.2	89	13.4	95	13.9	75.8	15.6	89.5	14.5
Innovation	99.3	14.5	90	12.6	98	13.1	73.3	16.4	90.2	14.2
Lacey	99.0	14.8	90	13.0	96	13.0	73.9	15.9	89.7	14.2
Quest	98.5	14.2	86	13.5	92	13.5	76.3	16.1	88.2	14.3
Stellar-ND	98.6	14.1	89	13.1	96	12.9	67.0	17.3	87.7	14.4
Tradition	99.1	15.6	93	12.6	95	13.0	66.7	15.7	88.5	14.2
Two-Rowed										
AAC Synergy	98.8	13.6	94	12.1	97	12.7	76.9	15.1	91.7	13.4
ABI Balster	97.4	13.9	89	11.8	95	12.7	52.8	17.2	83.6	13.9
ABI Growler	97.3	14.6	88	12.6	95	13.5	74.8	16.7	88.8	14.4
CDC Meredith	97.3	13.4	85	11.9	95	12.1	66.5	15.7	86.0	13.3
Conlon	98.9	14.5	98	13.0	98	13.3	89.5	16.0	96.1	14.2
LCS Genie	98.6	13.2	93	12.6	96	12.4	73.7	15.6	90.3	13.5
LCS Odyssey	99.1	12.4	93	10.9	97	11.9	79.3	15.9	92.1	12.8
ND Genesis	99.0	13.2	97	11.9	98	11.3	91.4	14.2	96.4	12.7
Pinnacle	99.1	13.9	96	11.4	98	10.9	88.5	13.8	95.4	12.5
Rawson	99.2	13.6	96	12.6	97	12.7	92.9	14.0	96.3	13.2
SY Sirish	99.1	12.8	92	11.3	97	13.0	71.0	16.1	89.8	13.3
Mean	98.6	14.0	92	12.4	96	12.7	75.9	15.7	90.6	13.7
CV %	0.3	5.5	2.6	4.3	0.9	3.8	8.7	4.4	5.3	4.5
LSD 0.05	0.5	1.6	3.4	0.7	1	0.8	9.3	1.0	6.9	0.9
LSD 0.10	0.4	1.3	2.9	0.6	1	0.7	7.8	0.8	5.7	0.7

Table 6. 2016 North Dakota oat variety descriptions.

Variety	Origin ¹	Year Released	Grain Color	Height	Straw Strength	Maturity ²	Reaction to Diseases			Bu/Wt.	Protein ⁵
							Stem Rust ³	Crown Rust ³	Barley Y.Dwf ⁴		
AAC Justice	AAFC/MN	2015	White	Tall	Strong	L	S	R	NA	Good	NA
AC Assiniboia	AAFC	1997	Red	Med.	Strong	L	S	S	T	Good	M/L
AC Kaufman	AAFC	2000	Yellow	Tall	Strong	L	S	S	MT	V.good	M/L
AC Pinnacle	AAFC	1999	White	Tall	Med.	L	S	S	S	V.good	L
Beach	ND	2004	White	Tall	M.strg.	M/L	S	MR/MS	MS	V.good	M
Buff	SD	2002	Hull-less	Med.	M.strg.	L	S	MR/MS	MT	Good	H
CDC Dancer	Sask.	2000	White	Tall	Strong	L	S	MS	S	V.good	M
CDC Minstrel	Sask.	2006	White	Tall	M.strg.	L	S	S	S	Good	M
CDC Weaver	Sask.	2005	Yellow	Med.	M.strg.	L	S	S	S	Good	M
Deon	MN	2013	Yellow	Tall	Strong	L	S	R	T	V.good	
Furlong	AAFC	2003	Red	Tall	M.strg.	L	S	S	T	V.good	M
Goliath	SD	2013	White	Tall	Med.	L	NA	MR/MS	NA	Good	M
Hayden	SD	2015	White	Med	Med	M	S	MR/MS	MT	V Good	M
HiFi	ND	2001	White	Tall	Strong	L	MR/MS	S	T	Good	M
Horsepower	SD	2012	White	Short	Strong	E/M	MS	S	MT	V.good	M/H
Hyttest	SD	1986	White	Tall	M.strg.	E	S	MS	S	V.good	H
Jury	ND	2012	White	Tall	M.strg.	M	R	S	MT	V.good	M
Killdeer	ND	2000	White	Med.	Strong	M	S	MS	MT	Good	M
Leggett	AAFC	2005	White	Tall	Strong	L	MR	R	S	Good	M
Loyal	SD	2000	Ivory	Tall	M.strg.	L	S	MR	T	Good	M/H
Maida	ND	2005	Yellow	Med.	Strong	M	R	S	MS	V.good	M/H
Morton	ND	2001	White	Tall	V.strg.	L	S	S	MT	V.good	M
Newburg	ND	2011	White	Tall	Med.	L	R	S	MT	Good	M
Otana	MT	1977	White	M.tall	M.weak	L	S	S	S	V.good	M/L
Paul	ND	1994	Hull-less	V.tall	Strong	L	R	MR/MS	T	Good	H
Rockford	ND	2008	White	Tall	Strong	L	S	S	MT	V.good	M
Sesqui	MN	2001	Yellow	M.tall	Strong	L	S	S	T	Good	M
Shelby 427	SD	2008	White	Med.	Strong	E	S	S	NA	V.good	NA
Souris	ND	2006	White	Med.	Strong	M	MS	S	MS	V.good	M
Stallion	SD	2006	White	Tall	Med.	L	S	MR	NA	V.good	M
Stark	ND	2004	Hull-less	Tall	M.strg.	L	R	MR/MS	T	V.good	M
Streaker	SD	2008	Hull-less	Tall	M.weak	M	S	R/MR	NA	V.good	M/H
Summit	AAFC	2008	White	Med.	Strong	L	S	S	MT	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.

²E = early; M = medium; L = late.

³R = resistant; MR = moderately resistant; MS = moderately susceptible; NA = not available; S = susceptible.

⁴Barley Yellow Dwarf Virus; S = susceptible; MS = moderately susceptible; MT = moderately tolerant; T = tolerant; NA = not available.

Varieties rated MT or T have a relatively good degree of protection against barley yellow dwarf virus.

⁵H = high; M = medium; L = low.

Table 7. Yield and test weight of oat varieties at three locations in eastern North Dakota, 2014-2016.

Variety	<u>Fargo</u>			<u>Edgelev</u>			<u>Langdon</u>			<u>Average Eastern N.D.</u>		
	Test	Yield		Test	Yield		Test	Yield		Test	Yield	
	Wt.	2016	3 Yr.	Wt.	2016	3 Yr.	Wt.	2016	3 Yr.	Wt.	2016	3 Yr.
	(lb/bu)	---(bu/a)---		(lb/bu)	---(bu/a)---		(lb/bu)	---(bu/a)---		(lb/bu)	---(bu/a)---	
AC Pinnacle	36.1	132.8	169.0	38.8	181.3	178.9	34.9	151.2	169.6	36.6	155.1	172.5
Beach	40.3	122.6	155.0	42.4	174.5	162.3	37.0	146.1	152.9	39.9	147.7	156.7
Beta-Gene	39.4	134.6	168.9	39.4	159.0	158.5	--	--	--	--	--	--
CDC Dancer	39.4	135.6	152.1	39.5	171.9	153.2	36.3	131.6	160.9	38.4	146.4	155.4
CDC Minstrel	37.6	135.0	167.8	37.1	168.9	159.4	33.2	145.3	160.9	36.0	149.7	162.7
Deon	40.1	148.1	170.0	41.3	183.6	165.9	35.5	161.6	170.4	39.0	164.4	168.8
Furlong	36.9	130.9	149.1	--	--	--	37.0	151.6	165.0	--	--	--
Goliath	41.4	136.6	159.3	42.3	170.3	163.4	36.2	131.7	155.8	40.0	146.2	159.5
Hayden	39.8	144.1	--	42.7	173.2	--	38.3	133.8	--	40.3	150.4	--
HiFi	38.8	125.1	143.6	40.4	164.1	159.4	35.8	139.4	156.4	38.3	142.9	153.1
Horsepower	41.5	131.5	145.8	40.9	150.7	142.5	--	--	--	--	--	--
Hystest	41.1	121.6	138.7	42.9	134.1	--	38.5	102.2	122.7	40.8	119.3	130.7
Jury	41.4	134.0	164.9	41.9	159.3	157.2	34.9	127.8	148.3	39.4	140.4	156.8
Killdeer	37.0	129.9	165.6	--	--	--	35.9	154.3	164.6	--	--	--
Leggett	38.5	140.1	168.9	40.4	153.2	154.0	37.1	157.0	170.5	38.7	146.7	164.5
Newburg	40.4	137.4	156.9	40.0	172.6	160.8	33.7	139.4	159.0	38.0	149.8	158.9
Otana	38.4	117.9	122.4	38.5	143.2	133.7	34.3	100.0	126.6	37.1	120.4	127.6
Paul ¹	42.4	79.7	102.2	45.6	118.7	116.7	44.2	98.5	119.8	44.1	99.0	112.9
Rockford	41.0	139.8	142.5	41.6	163.0	155.3	36.8	124.8	141.7	39.8	142.5	146.5
Souris	40.2	130.9	141.2	39.3	168.4	153.8	34.8	136.2	152.5	38.1	145.2	149.2
Stallion	41.5	132.3	157.4	41.2	155.5	149.1	35.9	106.6	141.3	39.5	131.5	149.3
Mean	39.6	132.3	152.1	40.9	162.2	154.4	36.2	134.5	152.2	39.1	141.0	151.6
CV %	5.7	6.4	--	1.7	7.3	--	3.1	12.4	--	3.2	6.6	--
LSD 0.05	3.7	13.6	--	1.1	19.2	--	1.5	23.8	--	2.0	14.9	11.1
LSD 0.10	3.1	11.4	--	0.9	16.1	--	1.3	19.9	--	1.7	12.5	9.3

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 8. Yield and test weight of oat varieties at four locations in western North Dakota, 2014-2016.

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.	2016	3 Yr.	Wt.	2016	3 Yr.	Wt.	2016	3 Yr.	Wt.	2016	3 Yr.	Wt.	2016	3 Yr.
	(lb/bu)	----(bu/a)----		(lb/bu)	----(bu/a)----		(lb/bu)	----(bu/a)----		(lb/bu)	----(bu/a)----		(lb/bu)	----(bu/a)----	
AC Pinnacle	37.1	150.3	176.0	36.9	77.4	143.8	40.3	150.9	138.0	45.2	103.3	90.9	39.9	120.5	137.2
Beach	38.1	130.9	138.8	38.2	59.6	131.8	42.2	144.4	150.9	47.5	86.0	64.3	41.5	105.2	121.5
CDC Dancer	37.0	135.3	149.1	37.3	62.4	135.0	37.8	140.1	143.5	45.7	101.1	84.1	39.5	109.7	127.9
CDC Minstrel	35.5	133.9	159.2	33.7	65.9	147.9	39.4	159.6	151.4	45.8	105.8	82.7	38.6	116.3	135.3
Deon	35.5	126.9	150.9	36.0	64.0	146.0	41.5	164.8	142.5	45.7	82.3	76.8	39.7	109.5	129.1
Furlong	34.0	130.5	153.1	33.5	59.0	148.8	40.0	152.7	146.1	44.2	101.1	74.3	37.9	110.8	130.6
Goliath	36.4	103.5	130.9	37.5	54.6	142.6	40.8	150.2	134.4	47.0	77.7	--	40.4	96.5	--
Haydon	36.6	140.7	--	37.0	68.9	--	41.6	160.6	--	--	--	--	--	--	--
HiFi	34.4	123.3	142.3	36.0	61.6	124.1	38.9	154.2	131.5	45.3	92.4	72.3	38.7	107.9	117.6
Hyttest	37.3	108.3	132.0	39.7	53.7	102.5	41.4	144.2	135.2	46.8	77.0	60.9	41.3	95.8	107.7
Jury	37.1	111.2	132.1	36.2	55.5	142.4	39.9	136.4	130.4	46.3	81.6	74.3	39.9	96.2	119.8
Killdeer	35.4	125.3	142.4	36.3	61.6	144.6	40.6	129.2	126.4	45.3	111.9	81.6	39.4	107.0	123.8
Leggett	36.0	133.4	160.2	35.9	61.5	143.1	39.2	136.8	134.7	45.4	104.4	77.0	39.1	109	128.8
Newburg	36.0	115.9	145.7	35.7	63.9	146.1	41.3	147.6	133.4	46.3	84.6	75.7	39.8	103	125.2
Otana	36.9	126.1	144.0	36.4	63.8	133.8	40.0	136.3	122.1	45.4	86.2	80.1	39.7	103.1	120.0
Paul ¹	38.6	91.8	109.7	41.1	46.2	109.1	45.0	102.0	111.6	51.9	62.6	52.2	44.2	75.7	95.7
Rockford	36.6	133.2	150.6	38.7	65.3	150.5	42.2	128.7	120.2	46.5	100.5	75.9	41.0	106.9	124.3
Souris	35.8	111.5	143.3	36.6	64.0	120.8	40.9	145.7	126.6	46.3	93.0	76.0	39.9	103.6	116.7
Stallion	39.1	118.4	143.0	37.4	59.6	125.7	38.0	121.6	143.5	46.2	92.1	62.9	40.2	97.9	118.8
Mean	35.7	123.7	144.6	36.0	61.5	135.5	40.0	142.4	134.6	45.7	91.3	74.2	40.0	104.7	122.2
CV %	3.8	9.0	--	3.6	9.1	--	1.8	8.8	--	5.9	1.2	--	2.5	8.5	7.0
LSD 0.05	1.9	15.5	--	1.8	8.0	--	1.2	21.0	--	7.6	0.7	--	1.4	12.2	12.0
LSD 0.10	1.6	12.9	--	1.5	6.7	--	1.0	17.5	--	6.4	0.6	--	1.2	10.1	10.0

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. 2016 North Dakota winter rye variety descriptions.

Variety	Origin ¹	Year Released	Height	Straw Strength	Maturity	Seed Color	Seed Size	Test Weight	Winter Hardiness
AC Hazlet	Canada	2006	Med.	Good	Med.	Blue	Large	Good	V.good
AC Rifle	Canada	1994	Short	V.good	Med.	Blue	Med.	Med.	V.good
AC Remington	Canada	1998	Short	V.good	Med.	NA ²	Med.	Good	Good
Aroostok	USDA	1981	Tall	Fair	Early	NA	Small	High	V.good
Ensi	Finland	1933	Tall	Fair	Late	NA	Small	Low	NA
Dacold	ND	1989	Med.	Good ³	V.late	Bl-grn.	Med.	Low	Good
Frederick	SD	1984	Tall	Fair	Late	Tan	Med.	High	Good
Hancock	WI	1979	Tall	Good	Med.	Tan	Large	High	Fair ⁴
Musketeers	Canada	1980	Tall	Fair	M.early	Blue	Large	Med.	V.good
ND Dylan	ND	2016	Tall	Good	Med	Blue	Med.	High	V. good
Prima	Canada	1984	Tall	Good	Med.	Blue	Large	Med.	V.good
Rymin	MN	1973	Tall	V.good	Late	Grn-gray	Large	High	Fair ⁴
Spooner	WI	1993	Tall	V.good	Med.	Tan	Large	High	Good
Wheeler	MI	1971	Tall	Fair	Med.	NA	Large	Low	Good
Wrens Abruzzi	GA	1953	Tall	Fair	Early	NA	Small	High	Good

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

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 three locations in North Dakota, 2014-2016.

Variety	<u>Hettinger</u>			<u>Langdon</u>		<u>Minot</u>			<u>Average</u>		
	Test Wt.	Seed Yield		Test Wt.	Seed Yield	Test Wt.	Seed Yield		Test Wt.	Seed Yield	
	(lb/bu)	2016	3-yr.	(lb/bu)	2016	(lb/bu)	2016	2-yr. Avg.	(lb/b)	2016	2/3-yr Avg.
		--(bu/a)--			--(bu/a)--		--(bu/a)--			--(bu/a)--	
Aroostok	55.4	45.6	48.6	52.6	55.6	53.7	59.0	53.8	53.9	53.4	51.2
Dacold	52.6	72.9	77.3	52.7	76.5	53.4	80.6	75.2	52.9	76.7	76.3
Hancock	54.2	59.9	65.7	54.3	75.8	54.8	78.3	73.6	54.4	71.3	69.7
Musketeer	54.3	70.7	--	54.0	64.7	55.0	81.9	--	54.4	72.4	--
ND Dylan	--	--	--	52.3	84.0	54.4	95.2	83.4	--	--	--
Rymin	54.2	62.1	--	53.5	65.8	54.8	77.5	--	54.2	68.5	--
Spooner	55.5	57.3	56.9	54.2	67.4	54.5	79.3	67.5	54.7	68.0	62.2
Mean	54.4	61.4	62.1	53.4	70.0	54.4	78.8	70.7	54.0	70.1	64.8
CV %	1.0	9.0	--	1.6	8.3	0.8	4.6	--	1.2	6.1	--
LSD 0.05	0.8	8.0	--	1.2	8.5	0.6	5.2	--	1.1	7.3	--
LSD 0.10	0.7	6.7	--	1.0	7.0	0.5	4.3	--	0.9	6.0	--

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