A-1196 (Revised)

North Dakota
Hard Winter Wheat

Variety Trial Results for 2012 and Selection Guide

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During the 2011-12 growing season, 750,000 acres were planted to winter wheat, with 700,000 acres harvested. This is the largest area of winter wheat ever planted and harvested in North Dakota. The state's winter wheat yield is estimated at 55 bushels per acre (bu/a), which ties the record yield obtained in 2010. Due to a mild winter, winter survival of the crop was excellent. Furthermore, due to relatively dry conditions, little disease pressure occurred this year. Stripe rust was problematic in a few areas on susceptible varieties.

Jerry was the most popular variety in 2011-12, occupying 35 percent of the acres planted. CDC Falcon, Overland, Hawken and Accipiter followed Jerry in popularity with 11, 7, 6 and 5 percent of the acreage, respectively.

Characteristics of hard red winter wheat varieties adapted for production in North Dakota are described in Table 1. Information on the agronomic performance of selected varieties is summarized in subsequent tables. Successful winter wheat production depends on numerous production practices, including selecting the right variety for a particular area. The information included in this publication is meant to help growers choose that variety or group of varieties. Characteristics to consider when selecting a variety are winter hardiness, yield potential in your area, test weight, protein content when grown with proper fertility, straw strength, plant height, reaction to important diseases and maturity.

The recommended seeding dates for winter wheat are Sept. 1-15 north of North Dakota Highway 200 and Sept. 15-30 in southern regions. Planting after the recommended dates reduces winter survival and grain yield. Planting prior to the recommended date may deplete soil moisture reserves unnecessarily. It also increases the risk of wheat streak mosaic virus and may reduce winter survival. Winter wheat should be seeded at a rate of 1 million to 1.2 million viable seeds per acre, or about 80 to 100 pounds per acre. Higher seeding rates should be used for late seeding or poor seedbed conditions. Producers should consider only the most winter-hardy varieties available when growing winter wheat in North Dakota. Relative ratings for winter hardiness are found in Table 1.

Phosphorus (P) aids overwinter survival by stimulating root growth and fall tillering. The secondary root system that develops during tillering is essential for a healthy, deep-rooted plant capable of withstanding stress. If winter wheat is planted on bare soil, an application of phosphorus is recommended, particularly if soil P levels are known to be low. However, while important, the contribution of phosphorus to overwinter survival is secondary to varietal hardiness. For more production information, see NDSU Extension Service publication EB-33, "Winter Wheat Production in North Dakota" *(www.ag.ndsu.edu/pubs/plantsci/smgrains/eb33w.htm).*

Data from several years and locations should be used when selecting varieties. The idea that data from a single location nearest your farm will indicate which variety will perform the best for you next year is incorrect. You should select varieties that, on average, perform the best at multiple trial locations near your farm across several years.

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Table 1. 2012 North Dakota hard winter wheat variety description and agronomic traits.

			Reaction to Disease[1]							
Variety	Agent or Origin[2]	Year	Stripe Rust	Leaf Rust	Stem Rust	Scab	Maturity[3]	Straw[4] Strength	Height[5] (inches)	Winter[6] Hardiness
AC Broadview	Can.	2011	MS	R	R	S/VS	0	5	36	4
AC Radiant[7]	Can.	2005	R	S	S	S	+1	2	36	2
Accipiter	W.Ag	2008	NA	MS	R	S	0	4	36	2
Alice[8]	SD	2006	NA	S	MR	S	-3	5	33	5
Art	Agripro	2008	R	R	R	MS	-4	4	33	8
Boomer	WB	2009	MS	MR	R	S	0	4	34	3
Carter	WB	2010	S	NA	NA	S	0	4	32	6
CDC Buteo	WB	2004	NA	MS	NA	S	0	6	36	2
CDC Falcon	WB	2000	MS	MS	NA	S	0	5	34	4
Darrell	SD	2006	NA	S	R	MS	-2	4	35	6
Decade	MT/ND	2010	S	VS	R	VS	-2	4	35	2
Expedition	SD	2002	MS	MS	R	S	-3	4	34	4
Hawken	Agripro	2007	S	MR	MR	S	-3	4	28	7
Ideal	SD	2011	NA	R	MR	S	-1	5	33	5
Jagalene	Agripro	2002	MS	S	MR	VS	-2	4	33	6
Jerry	ND	2001	MR	MR	R	S	0	5	37	3
Lyman	SD	2008	MS	R	R	MR	-2	7	35	5
Mace	ARS-NE	2008	NA	MS	R	MS	0	4	33	5
McGill	ARS-NE	2010	MS	MS	MR	MS	-3	4	36	4
Millennium	NE/SD	1999	MR	MR	MR	S	-2	4	37	6
Overland	NE	2006	MR	MR/R	MR	S	-2	4	35	5
Peregrine	W.Ag	2008	R	MR	R	MS	+1	4	39	2
Ransom	ND	1998	NA	MR	MR	S	+1	6	37	3
Robidoux	ARS-NE	2010	MR	MS	MR	S	-1	4	34	6
Roughrider	ND	1975	NA	S	R	MS	0	5	42	2
Smoky Hill	WB	2007	S	R	R	S	0	5	35	7
Striker	WB	2009	MS	MR	R	S	-2	4	32	5
SY Wolf	Agripro	2010	MS	MR	R	MS	-2	4	33	6
WB-Matlock	WB	2010	MS	MS	R	MS	+1	4	36	2
Wesley	NE/SD/WY	2000	MR	MS	R	S	-3	5	32	6
Yellowstone	MT	2005	R	S	S	VS	+2	4	33	5

[1]R = resistant; MR = moderately resistant; MS = moderately susceptible; S = susceptible; VS = very susceptible; NA = not available.
[2]W.Ag = Western Ag; WB = WestBred; SD = South Dakota State University; MT = Montana State University; ARS = USDA Agricultural Research Service; NE = University of Nebraska; WY = Wyoming.
[3]Days to heading relative to Jerry.
[4]Straw strength = 1 to 9 scale, with 1 strongest and 9 weakest. These ratings may change as additional data become available.
[5]Based on the average of several locations in 2011, and should be used for comparing varieties. The environment can impact the height of varieties.
[6]Relative winter hardiness rating: 1 = excellent, 10 = very poor. These values are subject to change as additional information becomes available.
[7]Curl mite resistant.
[8]White wheat.

Table 2. Yield of winter wheat varieties grown at five locations in western North Dakota in 2012, with three-year averages (2010-12).

	Williston			Dickinson		Minot			Mandan		Hettinger		Avg. Western N.D.		
Variety	No Fung.[1]	Fung.	3-Yr.[2] Avg.	No Fung.	3-Yr. Avg.	No Fung.	Fung.	2-Yr.[3] Avg.	No Fung.	3-Yr. Avg.	No Fung.	3-Yr. Avg.	No Fung.	Fung.	3-Yr.[3] Avg.
	(bu/a)														
AC Broadview	64.4	58.0	--	70.3	--	100.2	94.8	--	69.5	--	65.7	--	74.0	76.4	--
AC Radiant	59.4	59.7	51.7	--	--	88.7	92.7	--	45.8	34.9	72.9	67.5	--	76.2	--
Accipiter	65.8	59.7	56.1	60.3	56.5	97.4	105.5	73.7	60.7	41.4	58.3	64.5	68.5	82.6	58.4
Art	48.7	53.9	41.1	60.3	60.5	89.6	84.1	68.2	77.9	51.5	59.7	56.8	67.2	69.0	55.6
Boomer	62.8	61.7	52.6	66.4	58.1	98.2	100.8	75.9	66.2	45.5	67.5	66.7	72.2	81.3	59.8
Carter	59.9	59.9	51.7	63.2	--	84.1	98.3	69.5	55.7	38.4	66.2	--	65.8	79.1	--
CDC Falcon	69.4	65.9	53.5	68.3	62.4	90.1	95.2	72.0	--	--	--	--	--	80.6	--
Darrell	59.4	59.2	45.8	67.7	64.6	83.7	82.9	71.2	--	--	--	--	--	71.1	--
Decade	61.4	61.9	49.8	70.1	63.0	82.3	100.5	78.8	69.2	49.6	68.4	66.0	70.3	81.2	61.4
Expedition	--	--	--	--	--	77.4	82.0	65.8	--	--	--	--	--	82.0	--
Hawken	56.3	55.9	47.8	62.0	54.9	80.1	89.8	72.5	64.0	43.3	68.6	62.1	66.2	72.9	56.1
Ideal	62.1	62.1	--	62.7	60.9	100.8	89.9	74.4	70.8	--	66.3	--	72.5	76.0	--
Jerry	64.3	57.4	52.3	66.0	54.7	93.4	92.5	71.9	73.7	46.8	66.3	63.0	72.7	75.0	57.7
Lyman	48.0	53.1	43.8	67.9	61.7	89.8	78.6	68.8	67.1	46.7	73.7	65.2	69.3	65.9	57.2
McGill	53.9	56.7	--	60.0	--	78.2	82.3	--	76.5	--	61.8	--	66.1	69.5	--
Overland	67.0	59.6	51.4	75.4	66.0	76.8	77.7	67.3	90.0	58.5	73.8	66.4	76.6	68.7	61.9
Peregrine	67.1	66.1	58.1	54.9	55.3	97.6	95.7	71.0	55.3	40.8	46.9	53.3	64.4	80.9	55.7
Robidoux	67.9	56.8	--	66.4	--	85.1	87.4	--	73.2	--	61.4	--	70.8	72.1	--
SY Wolf	61.7	63.0	--	65.8	--	87.5	83.6	73.4	87.7	--	62.2	--	73.0	73.3	--
WB-Matlock	61.7	57.0	--	70.6	--	88.1	97.2	71.4	77.9	--	67.2	--	73.1	77.1	--
Wesley	47.7	54.3	47.2	51.8	52.3	83.7	79.1	69.0	73.3	47.7	66.4	60.5	64.6	66.7	55.3
Mean	60.4	59.1	50.2	64.4	59.3	87.6	89.8	72.5	69.7	45.4	65.2	62.9	69.8	75.1	57.9
CV (%)	9.4	11.4	--	9.5	--	12.7		--	17.3	--	7.7	--	--	--	--
LSD 0.10	7.7	9.3	--	5.3	--	15.0		--	14.2	--	5.8	--	--	--	--

Table 3. Yield of winter wheat varieties grown at four locations in eastern North Dakota in 2012, with three-year averages (2010-12).

	Carrington		Langdon			Prosper			Forman			Avg. Eastern N.D.		
Variety	No Fung.	3-Yr. Avg.	No Fung.	Fung.	3-Yr.[3] Avg.	No Fung.	Fung.	3-Yr.[3] Avg.	No Fung.	Fung.	3-Yr.[3] Avg.	No Fung.	Fung.	3-Yr.[3] Avg.
	(bu/a)													
AC Broadview	52.9	--	68.8	81.4	--	78.1	80.9	--	78.0	79.0	--	69.5	80.4	--
AC Radiant	--	--	59.9	65.7	--	--	--	--	--	--	--	--	--	--
Accipiter	47.5	53.2	65.4	74.1	73.5	61.3	68.3	49.1	70.4	64.3	51.4	61.2	68.9	59.9
Art	59.8	60.4	67.4	75.2	77.4	85.0	81.2	59.5	75.2	83.7	60.1	71.9	80.0	66.1
Boomer	49.6	58.3	71.0	80.5	75.0	74.2	81.4	56.6	71.3	72.2	53.0	66.5	78.0	63.9
Carter	43.7	51.7	55.1	65.1	67.4	72.6	70.6	50.5	75.4	74.7	53.0	61.7	70.1	56.5
CDC Falcon	53.7	58.1	68.0	76.0	75.0	--	--	--	--	--	--	--	--	--
Darrell	50.4	58.9	63.3	68.9	70.1	--	--	--	--	--	--	--	--	--
Decade	47.4	57.0	68.4	80.3	73.4	73.5	83.0	59.6	74.5	76.9	55.3	66.0	80.1	64.2
Expedition	--	--	57.0	76.1	--	--	--	--	--	--	--	--	--	--
Hawken	51.9	55.8	66.0	76.1	66.4	82.6	81.4	54.7	75.5	80.9	54.2	69.0	79.5	60.3
Ideal	47.3	58.3	65.2	74.5	78.6	84.8	85.8	--	65.8	88.2	--	65.8	82.8	--
Jerry	50.1	56.7	62.5	69.8	74.0	72.5	80.2	61.0	56.9	71.9	49.8	60.5	74.0	61.8
Lyman	50.6	58.0	65.9	69.7	74.5	79.2	83.3	57.2	67.8	82.6	56.0	65.9	78.5	63.4
McGill	57.0	--	69.9	77.7	--	74.8	77.8	--	77.1	87.2	--	69.7	80.9	--
Overland	58.9	65.0	73.9	74.5	76.6	83.8	91.8	66.5	80.3	85.7	63.4	74.2	84.0	70.1
Peregrine	51.9	57.0	73.7	76.2	76.5	61.6	60.5	53.7	67.9	57.8	53.3	63.8	64.8	64.3
Robidoux	59.9	--	72.2	79.5	--	87.9	100.7	--	81.5	84.1	--	75.4	88.1	--
SY Wolf	53.5	--	68.8	73.2	71.8	83.8	96.8	--	80.2	88.7	--	71.6	86.2	--
WB-Matlock	52.7	56.3	65.5	78.7	71.4	73.3	79.1	57.9	78.7	74.1	57.5	67.6	77.3	63.1
Wesley	52.7	58.2	59.0	71.9	64.4	76.6	80.5	55.4	75.1	76.4	52.1	65.9	76.3	57.7
Mean	52.1	57.5	65.9	74.2	72.8	76.7	81.4	56.8	73.4	78.1	54.9	67.4	78.2	62.6
CV (%)	10.1	--	6.1		--	8.6		--	10.8		--	--	--	--
LSD 0.10	4.9	--	6.0		--	6.6		--	7.8		--	--	--	--

[1]The fungicide treatment was Prosaro at 6.5 fl. oz. applied at the beginning of flowering.
[2]Avg is for nonfungicide data only.
[3]Avg includes fungicide and nonfungicide data when available.

Table 4. Test weight of winter wheat varieties grown at nine locations in North Dakota in 2012.

	Williston		Dickinson	Minot		Mandan	Hettinger	Carrington	Langdon		Prosper		Forman		Average	
Variety	No Fung.[1]	Fung.	No Fung.	No Fung.	Fung.	No Fung.	No Fung.	No. Fung.	No Fung.	Fung.	No Fung.	Fung.	No Fung.	Fung.	No Fung.	Fung.
	(lb/bu)															
AC Broadview	57.3	57.4	56.0	60.8	60.4	56.4	57.8	59.3	59.0	60.3	58.6	58.6	54.5	55.1	57.7	58.4
AC Radiant	59.4	58.6	--	61.0	57.2	54.3	59.0	--	60.4	60.8	--	--	--	--	--	--
Accipiter	58.7	57.9	54.8	60.9	59.5	56.1	57.5	59.1	60.8	61.9	58.7	59.2	56.1	56.1	58.1	58.9
Art	58.8	59.0	57.3	59.9	60.1	57.3	58.6	61.9	61.3	61.6	58.2	57.0	54.1	55.0	58.6	58.5
Boomer	56.1	56.0	54.8	61.0	60.3	55.6	57.3	58.7	59.7	60.8	58.8	59.3	54.8	54.9	57.4	58.3
Carter	57.3	57.2	55.8	60.9	59.8	54.1	58.6	60.0	60.6	61.5	58.2	58.2	53.9	53.8	57.7	58.1
CDC Falcon	58.4	58.1	55.0	59.9	60.5	--	--	60.7	60.6	61.1	--	--	--	--	--	--
Darrell	59.3	58.8	57.5	60.4	59.1	--	--	60.1	61.1	61.7	--	--	--	--	--	--
Decade	57.4	58.4	57.8	60.9	60.6	56.0	59.6	59.2	60.7	61.8	58.7	58.9	53.6	54.2	58.2	58.8
Expedition	--	--	--	60.4	60.5	--	--	--	59.3	61.0	--	--	--	--	--	--
Hawken	59.6	59.8	56.8	60.7	60.0	57.3	58.3	61.5	60.9	61.9	58.6	59.1	55.1	55.8	58.8	59.3
Ideal	58.8	58.9	57.5	60.9	60.1	57.3	59.6	59.2	60.3	60.9	60.5	59.3	54.0	55.9	58.7	59.0
Jerry	56.9	56.8	56.5	60.3	59.3	56.5	58.8	58.4	60.3	61.1	59.3	59.9	54.3	53.5	57.9	58.1
Lyman	58.6	59.1	57.8	60.6	60.2	57.8	59.3	62.0	60.5	61.5	59.7	60.0	56.0	55.3	59.1	59.2
McGill	59.1	59.5	55.5	59.5	60.4	57.2	58.3	60.9	60.4	61.5	56.5	57.4	54.5	54.5	58.0	58.7
Overland	58.1	58.5	57.5	59.7	59.4	58.9	58.9	60.6	60.8	61.4	60.0	60.2	54.9	55.2	58.8	58.9
Peregrine	58.9	58.0	56.8	60.3	58.9	57.6	55.0	59.7	61.1	61.0	58.5	59.7	55.6	55.6	58.2	58.6
Robidoux	59.4	60.1	57.0	60.6	59.1	56.5	57.3	61.4	59.8	61.2	58.0	59.6	54.3	54.7	58.3	58.9
SY Wolf	59.3	59.7	57.0	57.5	56.8	58.3	58.4	61.8	61.4	62.0	58.9	59.5	54.1	54.8	58.5	58.6
WB-Matlock	57.8	57.7	57.8	59.7	60.1	58.1	59.5	60.1	61.1	62.0	60.3	60.2	55.4	55.3	58.9	59.1
Wesley	57.6	58.5	56.5	60.9	60.0	56.7	57.8	59.9	60.8	61.6	57.6	58.6	53.7	53.1	57.9	58.4
Mean	58.3	58.4	56.7	60.3	59.6	56.8	58.3	60.3	60.6	61.4	58.8	59.1	54.7	54.9	58.3	58.7
CV (%)	0.8		1.3	1.7		2.4	1.8	1.4	0.7		1.7		1.8		--	--
LSD 0.10	1.4		0.9	1.3		1.6	1.3	0.8	0.6		0.9		0.9		--	--

[1]The fungicide treatment was Prosaro at 6.5 fl. oz. applied at the beginning of flowering.

Table 5. Grain protein content of winter wheat varieties grown at eight locations in North Dakota in 2012.

Variety	Williston	Dickinson	Mandan	Hettinger	Carrington	Langdon	Prosper	Forman	Average
	(%)								
AC Broadview	12.6	13.8	10.6	13.0	7.9	8.9	12.1	13.8	11.6
AC Radiant	11.5	--	11.4	13.5	--	8.9	--	--	--
Accipiter	11.7	14.8	10.8	13.3	8.5	9.6	12.2	13.5	11.8
Art	14.5	14.4	12.2	14.4	9.5	10.0	13.1	14.4	12.8
Boomer	12.9	14.1	11.5	13.3	8.4	8.8	12.1	14.4	11.9
Carter	13.0	14.6	12.1	14.0	9.0	10.2	12.5	14.3	12.5
CDC Falcon	11.6	14.4	--	--	8.6	9.1	--	--	--
Darrell	13.6	13.5	--	--	9.0	10.1	--	--	--
Decade	13.1	14.4	11.6	14.5	9.2	9.4	11.8	14.2	12.3
Expedition	--	--	--	--	--	8.9	--	--	--
Hawken	13.5	14.0	12.5	14.1	9.4	10.4	12.9	14.4	12.7
Ideal	11.9	13.9	11.2	12.6	8.6	9.7	12.1	13.7	11.7
Jerry	13.2	14.1	11.1	13.9	8.3	9.4	12.3	14.7	12.1
Lyman	14.6	14.0	12.3	14.1	9.5	10.3	12.5	14.8	12.8
McGill	12.3	13.3	11.2	12.6	8.5	9.2	12.9	13.9	11.7
Overland	13.5	13.5	11.6	13.1	8.6	9.3	12.5	14.0	12.0
Peregrine	11.5	14.5	11.6	13.7	8.4	9.0	12.8	13.9	11.9
Robidoux	11.6	13.7	10.8	13.5	8.8	9.3	12.7	13.3	11.7
SY Wolf	12.1	13.7	10.9	14.0	9.1	9.8	12.3	13.7	12.0
WB-Matlock	13.7	14.2	11.2	13.2	8.5	9.1	12.9	14.4	12.2
Wesley	12.8	14.6	12.0	14.0	9.6	10.2	13.2	14.4	12.6
Mean	12.8	14.1	11.5	13.6	8.9	9.5	12.6	14.1	12.1
CV (%)	5.7	1.9	4.7	1.7	5.0	4.6	6.7	2.8	--
LSD 0.10	1.3	0.7	0.6	0.3	0.5	0.8	0.8	0.4	--

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