A-1196 (Revised)

North Dakota
Hard Winter Wheat

Variety Trial Results for 2011 and Selection Guide

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During the 2010-11 growing season, 340,000 acres were planted to winter wheat in North Dakota, which is about the same as last year. The state winter wheat yield is estimated at 49 bushels per acre (bu/a), which is down substantially from last year. Due to good snow cover throughout the winter, survival of the winter wheat crop was good. Diseases and hot July temperatures, as well as excessive moisture in many regions of the state, took their toll on winter wheat yields. Leaf rust caused only minimal damage this year; little leaf rust development occurred in southern states and, therefore, little rust inoculum developed. Scab was problematic in certain parts of the state on winter wheat.

Jerry was the most popular variety in 2010-11, occupying 38 percent of the acres planted. CDC Falcon, Hawken and Jagalene followed Jerry in popularity with 11, 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. 10-30 south of North Dakota Highway 200 and Sept. 1-15 in northern 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 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 essential. 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. 2011 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 Strength	Height[4] (inches)	Winter[5] Hardiness
Accipiter	W.Ag	2008	NA	MS	R	S	0	Strong	36	2
Alice[6]	SD	2006	NA	S	MR	S	-3	M. strong	33	NA
Art	Agripro	2008	R	R	R	MS	-4	Strong	33	8
Boomer	WB	2009	MS	MR	R	S	0	Strong	34	3
Carter	WB	2010	S	NA	NA	S	0	Strong	32	6
CDC Buteo	WB	2004	NA	MS	NA	S	0	Med.	36	2
CDC Falcon	WB	2000	MS	MS	NA	S	0	M. strong	34	4
Darrell	SD	2006	NA	S	R	MS	-2	Strong	35	6
Decade	MT/ND	2010	S	VS	R	VS	-2	Strong	35	2
Expedition	SD	2002	MS	MS	R	S	-3	Strong	34	4
Hawken	Agripro	2007	S	MR	MR	S	-3	Strong	28	7
Ideal	SD	2011	NA	R	MR	S	-1	M. strong	33	5
Jagalene	Agripro	2002	MS	S	MR	VS	-2	Strong	33	6
Jerry	ND	2001	MR	MR	R	S	0	Strong	37	3
Lyman	SD	2008	MS	R	R	MR	-2	Med.	35	5
Mace	ARS-NE	2008	NA	MS	R	MS	0	Strong	33	NA
Millennium	NE/SD	1999	MR	MR	MR	S	-2	Strong	37	6
Overland	NE	2006	MR	MR/R	MR	S	-2	Strong	35	5
Peregrine	W.Ag	2008	R	MR	R	MS	+1	Strong	39	2
Radiant[7]	Can.	2005	R	S	S	S	+1	V.strong	36	2
Ransom	ND	1998	NA	MR	MR	S	+1	Med.	37	3
Roughrider	ND	1975	NA	S	R	MS	0	M. strong	42	2
Striker	WB	2009	MS	MR	R	S	-2	Strong	32	5
SY Wolf	Agripro	2010	MS	MR	R	MS	-2	Strong	33	6
WB-Matlock	WB	2010	MS	MS	R	MS	+1	Strong	36	2
Wesley	NE/SD/WY	2000	MR	MS	R	S	-3	M. strong	32	6
Yellowstone	MT	2005	R	S	S	VS	+2	Med.	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.
[3]Days to heading relative to Jerry.
[4]Based on the average of several locations in 2011, and should be used for comparing varieties. The environment can impact the height of varieties.
[5]Relative winter hardiness rating: 1 = excellent, 10 = very poor. These values are subject to change as additional information becomes available.
[6]White wheat.
[7]Curl mite resistant.

Table 2. Yield of winter wheat varieties grown at four locations in western North Dakota in 2011, with three-year averages (2009-11).

Variety	Williston			Dickinson[2]		Minot[2]			Mandan			Avg. Western N.D.		
	No Fung.	Fung.	3-Yr.[1] Avg.	No Fung.	2-Yr. Avg.	No Fung.	Fung.	2-Yr. Avg.	No Fung.	Fung.	3-Yr. Avg.	No Fung.	Fung.[3]	3-Yr. Avg.
	(bu/a)													
Accipiter	59.5	69.0	--	40.6	54.6	35.8	55.9	--	13.5	19.2	46.2	37.4	48.0	--
Art	69.8	79.3	39.2	65.4	60.6	36.4	62.8	60.6	20.7	31.9	48.6	48.1	58.0	52.3
Boomer	62.7	68.5	47.5	37.0	53.9	38.9	65.6	59.1	9.6	22.1	46.6	37.1	52.1	51.8
Carter	71.1	75.2	--	46.8	--	38.9	56.7	--	12.0	19.5	--	42.2	50.5	--
CDC Falcon	64.4	63.3	47.0	48.6	59.5	34.8	68.0	55.8	13.7	23.9	44.4	40.4	51.7	51.7
Darrell	62.4	69.8	41.6	54.2	63.0	52.4	65.8	72.5	13.7	21.9	46.6	45.7	52.5	55.9
Decade	68.8	72.9	--	48.6	59.5	56.3	76.1	--	25.0	30.0	55.6	49.7	59.7	--
Expedition	71.3	74.0	--	54.6	60.9	40.9	62.8	59.0	18.3	29.4		46.3	55.4	--
Hawken	54.2	70.1	43.6	41.1	51.4	50.4	69.8	55.6	17.1	20.1	48.7	40.7	53.3	49.8
Ideal	73.6	76.7	----	46.7	60.0	44.1	62.7	--	17.4	31.5	--	45.5	57.0	--
Jerry	61.4	61.2	46.6	39.1	49.0	44.1	57.4	59.8	9.3	19.7	44.2	38.5	46.1	49.9
Lyman	65.3	74.6	41.3	55.6	58.5	40.5	66.3	61.2	14.7	25.8	49.8	44.0	55.6	52.7
Millennium	71.9	70.3	43.7	50.4	55.4	47.4	66.0	60.4	17.6	33.0	48.8	46.8	56.4	52.1
Overland	75.1	76.3	45.0	50.5	61.3	46.7	67.9	64.9	22.8	34.0	52.9	48.8	59.4	56.0
Peregrine	68.9	61.2	--	42.7	55.5	39.6	51.2	--	19.3	22.7	49.9	42.6	45.0	--
Radiant	60.8	65.5	--	--	--	--	--	--	13.6	20.6	45.9	--	43.1	--
Striker	56.9	64.0	41.6	37.7	49.4	37.6	60.4	54.7	11.1	22.4	42.2	35.8	48.9	47.0
SY Wolf	67.0	81.9	--	61.8	--	55.1	67.2	--	31.9	32.2	--	54.0	60.4	--
WB-Matlock	59.9	66.9	--	28.8	--	37.3	62.9	--	13.8	21.4	--	35.0	50.4	--
Wesley	71.3	67.7	45.6	47.8	52.5	44.6	68.5	58.9	12.6	19.6	48.1	44.1	51.9	51.3
Yellowstone	64.5	62.0	49.9	35.7	54.7	23.4	47.9	52.3	2.7	11.4	42.0	31.6	40.4	49.7
Mean	65.8	70.0	44.4	46.7	56.5	42.7	62.7	--	15.4	23.5	--	42.7	52.2	51.7
CV (%)	6.8		--	13.3	--	13.0		--	24.2		--	--	--	--
LSD 0.05	7.4		--	8.8	--	11.2		--	9.3		--	--	--	--

[1]3-year average is for no fungicide treatments only.
[2]Dickinson and Minot 2-year Avg. is 2009 and 2011.
[3]Average of Williston, Minot and Mandan.

Table 3. Yield of winter wheat varieties grown at four locations in eastern North Dakota in 2011, with three-year averages (2009-11).

Variety	Carrington			Langdon			Prosper			Forman[2]			Avg. Eastern N.D.		
	No Fung.	Fung.	3-Yr.[1] Avg.	No Fung.	Fung.	3-Yr. Avg.	No Fung.	Fung.	3-Yr. Avg.	No Fung.	Fung.	2-Yr. Avg.	No Fung.	Fung.	3-Yr. Avg.
	(bu/a)														
Accipiter	36.3	35.3	47.4	57.9	65.4	--	27.7	37.6	--	28.3	43.2	37.6	37.6	45.4	--
Art	38.9	52.0	49.0	66.8	69.6	88.7	24.8	34.4	44.6	35.0	44.6	46.1	41.4	50.2	57.1
Boomer	44.6	47.2	52.7	60.3	64.1	82.3	21.5	32.6	46.5	31.2	39.2	39.4	39.4	45.8	55.2
Carter	32.6	40.2	--	57.6	66.7	--	21.8	30.2	--	27.4	41.0	35.0	34.9	44.5	--
CDC Falcon	45.5	56.4	47.2	67.6	73.4	81.9	22.1	30.1	43.4	26.9	40.2	35.6	40.5	50.0	52.0
Darrell	44.4	44.9	54.8	57.7	65.1	79.3	28.3	40.8	46.4	32.3	41.2	45.3	40.7	48.0	56.5
Decade	43.2	50.6	--	65.5	71.7	--	25.6	36.5	--	32.8	43.7	41.1	41.8	50.6	--
Expedition	45.1	52.7	--	52.7	59.9	--	29.5	47.8	--	33.5	43.0	--	40.2	50.9	--
Hawken	34.8	41.4	47.8	51.1	62.9	64.6	18.2	36.7	36.4	30.5	38.9	39.0	33.7	45.0	47.0
Ideal	47.1	59.9	55.1	69.6	73.7	--	30.4	34.2	--	34.7	48.3	--	45.5	54.0	--
Jerry	44.2	43.5	51.5	65.1	72.9	81.9	31.6	44.6	49.1	31.7	30.9	42.7	43.2	48.0	56.3
Lyman	52.7	48.7	49.8	57.9	66.7	82.8	33.7	38.0	48.7	31.8	46.1	41.8	44.0	49.9	55.8
Millennium	43.7	44.2	50.6	60.4	65.2	76.5	32.4	40.9	54.3	30.2	43.8	40.3	41.7	48.5	55.4
Overland	54.6	59.8	57.0	59.7	65.2	83.9	32.4	49.2	53.5	39.6	49.7	47.2	46.6	56.0	60.4
Peregrine	45.3	44.2	52.7	70.7	72.0	--	34.9	39.3	--	33.3	45.7	44.3	46.1	50.3	--
Radiant	--	--	--	--	--	--	28.7	33.5	--	--	--	--	--	--	--
Striker	40.0	59.2	49.4	55.3	63.2	78.0	17.0	35.3	40.4	24.9	37.2	36.8	34.3	48.7	51.2
SY Wolf	46.9	49.9	--	59.0	62.6	--	34.6	48.7	--	32.2	40.7	--	43.2	50.5	--
WB-Matlock	44.1	40.7	47.6	54.8	63.2	--	26.5	45.9	--	35.8	43.6	44.1	40.3	48.4	--
Wesley	45.2	45.3	49.9	54.7	59.2	73.3	26.9	31.0	42.0	24.4	34.1	34.2	37.8	42.4	49.9
Yellowstone	22.6	35.1	45.6	51.2	63.1	69.2	12.1	28.0	35.7	21.3	32.5	28.3	26.8	39.7	44.7
Mean	41.9	45.8	50.5	59.7	66.3	78.5	26.8	38.1	45.1	30.9	41.4	39.9	40.0	48.3	53.4
CV (%)	10.4	14.8	--	13.4		--	25.4		--	14.8		--	--	--	--
LSD 0.05	7.1	11.1	--	5.1		--	13.1		--	8.6		--	--	--	--

[1]3-year average is for no fungicide treatments only.
[2]Forman data, 2-year, 2010 and 2011.

Table 4. Test weight of winter wheat varieties grown at eight locations in North Dakota in 2011.

	Williston		Dickinson	Minot		Mandan	Carrington		Langdon		Prosper		Forman		Average	
Variety	No Fung.	Fung.	No Fung.	No Fung.	Fung.	Fung.	No Fung.	Fung.	No Fung.	Fung.	No Fung.	Fung.	No Fung.	Fung.	No Fung.	Fung.
	(lb/bu)															
Accipiter	58.9	59.8	46.4	53.1	57.7	51.6	59.0	59.9	59.4	60.4	50.1	53.0	48.5	54.5	53.6	56.7
Art	60.8	61.3	51.3	54.6	58.4	51.9	58.5	60.2	61.2	61.8	49.6	51.0	49.6	54.2	55.1	57.0
Boomer	58.4	58.2	44.5	52.8	57.4	50.1	57.2	59.5	58.9	60.2	48.1	51.0	49.2	53.7	52.7	55.7
Carter	60.1	61.2	48.0	53.6	57.8	50.5	58.5	60.3	60.4	61.3	48.7	50.7	47.9	53.4	53.9	56.5
CDC Falcon	58.9	60.1	48.4	52.0	57.0	51.1	57.5	60.1	59.9	60.7	47.8	51.3	46.6	52.5	53.0	56.1
Darrell	59.6	59.5	50.5	56.1	59.4	50.9	59.5	60.2	60.4	60.8	49.7	52.9	51.0	54.2	55.3	56.8
Decade	60.4	60.4	48.5	53.4	58.6	51.4	58.7	59.9	60.9	61.6	47.3	50.1	49.6	51.8	54.1	56.3
Expedition	59.9	60.2	51.5	55.0	59.1	52.0	59.0	60.1	60.1	60.6	51.0	54.1	49.2	54.7	55.1	57.3
Hawken	59.6	60.8	50.1	55.3	57.9	50.4	58.7	59.7	59.1	60.1	49.2	51.2	48.0	52.5	54.3	56.1
Ideal	60.6	61.5	48.8	54.9	59.4	51.8	59.3	59.9	60.7	61.3	49.6	51.1	49.1	54.7	54.7	57.1
Jerry	58.8	59.2	48.9	54.0	57.8	50.0	57.6	57.8	59.7	60.4	49.9	52.4	52.1	54.2	54.4	56.0
Lyman	61.4	61.1	51.6	56.6	59.8	52.2	60.3	60.8	60.7	61.0	52.3	53.8	52.5	56.2	56.5	57.8
Millennium	60.1	60.2	48.6	56.4	59.2	52.9	60.1	58.3	60.2	60.7	51.0	52.0	50.5	54.2	55.3	56.8
Overland	60.9	61.0	49.8	56.8	59.2	52.9	59.8	60.5	60.8	61.3	50.8	53.5	51.6	54.7	55.8	57.6
Peregrine	59.4	59.2	48.6	56.6	58.6	52.1	59.5	60.6	60.9	61.0	52.5	53.7	51.7	54.5	55.6	57.1
Radiant	57.9	58.2	--	--	--	51.5	--	--	--	--	49.3	51.1	--	--	--	--
Striker	60.3	61.0	46.8	54.0	57.9	51.5	57.2	59.2	60.4	61.5	46.5	51.2	49.5	53.8	53.5	56.6
SY Wolf	60.0	61.1	50.5	56.7	59.3	51.7	59.4	60.6	60.5	61.1	50.0	52.6	47.9	51.2	55.0	56.8
WB-Matlock	60.7	60.7	48.0	55.6	59.2	52.9	59.5	60.0	60.1	60.8	51.2	53.9	51.6	56.4	55.2	57.7
Wesley	60.2	60.0	47.3	53.3	57.3	48.8	57.7	57.2	59.7	60.5	46.4	49.7	44.6	49.2	52.7	54.7
Yellowstone	58.0	57.9	42.3	48.0	54.9	46.8	54.8	58.5	57.4	58.8	43.0	47.6	48.7	44.6	50.3	52.7
Mean	59.8	60.1	48.5	54.4	58.3	51.2	58.6	59.7	60.1	60.8	49.2	51.8	49.5	53.3	54.3	56.5
CV (%)	0.9		4.4	1.04		1.9	1.3	2.0	1.7		4.1		2.6		--	--
LSD 0.05	1.0		3.0	0.95		1.6	1.2	2.0	0.6		3.3		4.1		--	--

Table 5. Grain protein content of winter wheat varieties grown at seven locations in North Dakota in 2011[1].

Variety	Williston	Minot	Mandan	Carrington	Langdon	Prosper	Forman	Average
	(%)							
Accipiter	12.1	13.9	12.6	11.9	11.7	13.0	13.6	12.7
Art	12.4	13.9	13.0	13.3	13.0	14.8	14.0	13.5
Boomer	12.5	13.6	13.3	12.6	12.1	14.8	14.4	13.3
Carter	12.4	13.5	13.6	13.3	12.5	15.0	14.7	13.6
CDC Falcon	12.3	13.6	12.8	12.3	11.5	14.3	13.9	13.0
Darrell	12.4	13.8	13.2	12.4	12.3	14.3	14.0	13.2
Decade	12.2	13.4	12.9	12.6	11.9	14.7	13.8	13.1
Expedition	12.3	13.9	13.0	12.4	12.3	13.6	13.9	13.1
Hawken	12.3	13.9	13.3	13.4	13.2	15.3	14.5	13.7
Ideal	12.0	14.1	12.5	12.4	11.5	13.4	--	12.7
Jerry	12.0	13.7	13.6	12.8	12.0	14.2	14.8	13.3
Lyman	12.8	13.6	13.6	13.2	13.4	14.3	14.2	13.6
Millennium	11.7	14.3	12.4	12.9	12.3	14.5	14.1	13.2
Overland	11.7	13.8	12.4	12.6	12.0	14.2	13.9	12.9
Peregrine	12.5	14.1	12.7	11.8	11.2	13.2	13.4	12.7
Radiant	12.4	--	12.4	--	--	12.7	--	12.5
Striker	11.8	13.8	13.3	12.7	12.4	13.9	14.7	13.2
SY Wolf	12.1	13.8	12.2	12.7	12.3	14.0	13.6	13.0
WB-Matlock	12.2	13.8	13.6	13.2	12.9	14.2	14.5	13.5
Wesley	12.9	13.8	13.7	13.0	13.0	14.3	14.8	13.6
Yellowstone	12.2	13.7	13.2	12.6	12.1	14.2	14.2	13.2
Mean	12.2	13.8	13.0	12.7	12.3	14.1	14.2	13.2
CV (%)	4.4	4.2	2.7	3.4	1.0	6.2	3.6	--
LSD 0.05	NS	0.9	0.6	0.7	0.4	1.4	0.8	--

[1]Average of fungicide treatments.

1.4-11-11