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## 2007 Winter Wheat Variety Yield Results and Planting Tips

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After a very tough 2006 in South Dakota, 2007 was a much better year for winter wheat production. The eastern part of the state had plentiful moisture and, even though conditions were still dry in central and western South Dakota, most central and western areas had timely rains to produce a decent crop. In many areas in 2007, moisture wasn't the major factor affecting yields; instead, the major factor affecting yields in many areas was leaf rust.

### Leaf rust outbreak affects yields in some areas: Jagalene and Darrell varieties more susceptible

The southern plains had a serious rust outbreak this year, and this produced abundant spores to blow north. This outbreak caused significant yield reductions on susceptible winter wheat varieties at many locations. Some varieties have lost the resistance they used to have, with the varieties Jagalene and Darrell in particular showing more suscepti-

bility. The gene responsible for resistance in Jagalene and Darrell, LR24, is no longer resistant to leaf rust because of the widespread planting of Jagger (also with LR24) throughout the Great Plains.

Many varieties susceptible to leaf rust performed well in locations without rust infection (Wall and Bison) and may still be a good choice for producers prepared to spray with foliar fungicides. Table 3 includes numerical leaf rust ratings taken from the 2007 CPT trials (these ratings may vary from the susceptible/resistance ratings in the previous column because of the defeat of LR24).

Yields from the Crop Performance Testing Program averaged 48 bu/A statewide, with all locations making it to harvest. The top performing varieties East River in 2007 were Overland, Millennium, Arapahoe, Harding, Wahoo, and Hawken; while Overland, Wesley, Trego, NuDakota, and

### Recommended Varieties for 2008

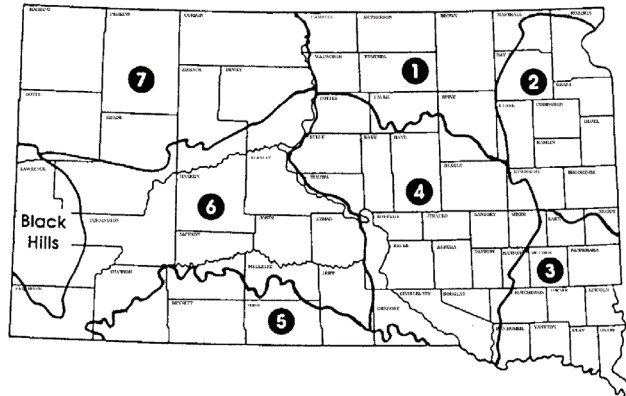
#### Recommended:

Variety	Crop Adaptation Area
Alice (white) <sup>PVP</sup>	1 <sup>pc</sup> , 4 <sup>pc</sup> , 5, 6, 7 <sup>pc</sup>
Expedition <sup>PVP</sup>	1 <sup>pc</sup> , 4 <sup>pc</sup> , 5, 6, 7 <sup>pc</sup>
Harding <sup>PVP</sup>	1 <sup>pc</sup> , 2 <sup>pc</sup> , 4, 7
Millennium <sup>PVP</sup>	1 <sup>pc</sup> , 4 <sup>pc</sup> , 5, 6, 7 <sup>pc</sup>
Overland <sup>PVP</sup>	1 <sup>pc</sup> , 3, 4 <sup>pc</sup> , 5, 6, 7 <sup>pc</sup>
Wendy (white) <sup>PVP</sup>	5, 6, 7 <sup>pc</sup>
Wesley	5, 6, 7 <sup>pc</sup>

#### Acceptable/Promising

Variety	Crop Adaptation Area
Arapahoe <sup>PVP</sup>	1 <sup>pc</sup> , 3, 4 <sup>pc</sup> , 5, 6, 7 <sup>pc</sup>
Darrell <sup>PVP</sup>	1 <sup>pc</sup> , 4 <sup>pc</sup> , 5, 6, 7 <sup>pc</sup>
Hatcher <sup>PVP</sup>	5, 6, 7 <sup>pc</sup>
Jagalene <sup>PVP</sup>	5, 6, 7 <sup>pc</sup>
NuDakota (white) <sup>PVP</sup>	5, 6, 7 <sup>pc</sup>
Wahoo <sup>PVP</sup>	3, 4 <sup>pc</sup> , 5, 6

Crop adaptation areas for South Dakota (revised 1992)



<sup>PVP</sup> U.S. Plant Variety Protection applied for and/or issued; seed sales of these varieties are restricted to classes of certified seed.  
<sup>pc</sup> Plant into protective cover.

Hawken did best West River. The varieties Overland, Millennium, Arapahoe, Wahoo, Wesley, Wendy, and Hatcher had the best three-year statewide average yields.

Tables 1, 2, and 3 give the characteristics and performance of winter wheat varieties tested in South Dakota. Use them to select a variety with the agronomic characteristics suitable for your area and production system. When considering yield, look for varieties that have performed well at locations near your farm over the past three years.

### Winter Wheat Production Tips

Winter wheat planting season is around the corner. Here are some tips that will set the crop for success in 2008:

1. Choose a variety with good agronomic characteristics that is recommended for your area and that, on average, performed well in locations near your farm in the last few years.

2. Direct seed into standing stubble. The standing stubble traps snow and the trapped snow insulates wheat seedlings against cold temperatures, reducing risk of winterkill.

Seeding winter wheat into broadleaf crop stubble is recommended to reduce the risk of insect, disease, and weed problems in the rotation. Seeding into wheat stubble should be avoided as this can increase the risk of disease carryover to the following season.

If planting winter wheat into a fallow field, it is important to minimize the number of tillage operations just before planting. Plowing and other deep tillage operations can reduce seedbed firmness, dry the topsoil, and bury protective residues, increasing the risk of winter kill.

3. Control weeds now. Controlling grassy weeds and volunteer wheat crop two weeks prior to planting winter wheat will provide a break in the life cycle of wheat curl mite and help to control wheat streak mosaic and other diseases.

4. Plant on time. In South Dakota the recommended time to plant winter wheat is Sept. 15 through Oct. 10. Wheat

Table 1. Hard winter wheat yield results - West River Locations, 2007 (bu/A).

<i>Variety</i>	Winner <i>2007</i>	Kennebec <i>2007</i>	Hayes <i>2007</i>	Martin <i>2007</i>	Wall <i>2007</i>	Sturgis <i>2007</i>	Bison <i>2007</i>	West River <i>2007</i>
Overland	53	55	52	38	47	33	58	48
Millennium	51	54	52	36	44	34	52	46
Arapahoe	51	53	52	40	51	29	49	46
Harding	45	50	55	35	38	31	44	43
Hawken (HWW)	42	50	53	35	56	32	59	47
Wahoo	45	47	56	39	45	33	52	45
NuDakota (HWW)	48	46	52	36	56	29	61	47
Trego (HWW)	47	50	52	39	52	33	57	47
Wesley	45	51	52	44	54	31	57	48
Wendy (HWW)	48	42	54	37	55	30	56	46
Expedition	44	43	55	32	51	30	52	44
Tandem	43	46	58	34	46	30	52	44
Overley	45	46	51	38	45	23	54	43
Jerry	37	41	48	32	40	32	37	38
Hatcher	35	47	50	35	61	35	55	45
Alice (HWW)	42	37	45	33	50	30	55	42
Danby (HWW)	35	42	55	31	40	31	56	41
Darrell	35	38	53	32	46	30	49	40
Ripper	36	40	52	32	48	32	52	42
Jagalene	27	29	49	25	48	29	51	37
Mean	43	45	52	35	48	31	52	44
CV	5	4	5	4	11	3	5	.
LSD.05	8	7	7	8	14	6	7	.

plants should be well established before freezing to attain maximum cold tolerance and to accumulate enough energy reserves for the following spring.

Planting wheat too early may produce excessive fall growth, reducing amounts of soil moisture and nutrients. Early-planted wheat may act as a host for leaf curl mites that transmit wheat streak mosaic virus, and it may also increase the risk of root and crown rot diseases.

Research from western South Dakota has shown that when planting is later than Oct. 15, grain yield is decreased and the crop suffers substantial winter injury.

5. Don't plant too deep or too shallow. Plant winter wheat at a depth of 1.5 to 2 inches in a firm seedbed. Planting deeper than 2 inches reduces emergence and can result in weak spindly seedlings with a poor ability to survive the winter. For direct seeding, a uniform depth of 1 to 1.5 inches under optimum moisture conditions will give a good stand.

If it is necessary to plant deeper to get to mois-

ture, growers should choose a variety with a longer coleoptile (Table 3). Make sure there is good soil-to-seed contact, especially under drier conditions. If soil cover over the seed is poor, there is risk of exposing the crown and adversely affecting winter survival.

6. Plant the right amount of seed. The recommended seeding rates are 22 pure-live-seeds per square foot (approximately 960,000 seeds/acre). If you have a poor seedbed or are planting later than the recommended dates, increase seeding rate to 28 pure-live-seeds per square foot. However, properly managed winter wheat has a tremendous ability to tiller and can compensate for thin stands.

7. Test soils and apply fertilizer based on soil test results and yield expectations. Research has shown that phosphorus helps winter survival by stimulating root growth and tillering in the fall. Therefore, if soil test results indicate low phosphorus, application of the required rate is recommended.

Table 2. Hard winter wheat yield results - East River Locations, 2007 (bu/A).

Variety	Watertown	Brookings	Platte	Dakota Lakes	Onida	Selby	East River	Statewide	
	2007	2007	2007	2007	2007	2007	2007	2007	3-yr
Overland	74	60	69	67	61	76	68	57	52
Millennium	72	57	70	63	61	69	65	55	50
Arapahoe	66	56	62	61	60	65	62	53	48
Harding	62	50	69	61	61	68	62	51	46
Hawken (HWW)	61	51	61	56	62	48	57	51	.
Wahoo	55	49	55	63	60	63	58	51	48
NuDakota (HWW)	57	44	61	53	61	55	55	51	.
Trego (HWW)	54	43	52	59	54	61	54	50	46
Wesley	42	45	66	55	59	52	53	50	47
Wendy (HWW)	43	46	52	62	57	57	53	49	47
Expedition	45	46	57	60	52	66	54	49	46
Tandem	54	43	55	54	56	53	53	48	44
Overley	40	47	61	59	50	42	50	46	45
Jerry	57	50	54	51	55	64	55	46	45
Hatcher	47	40	54	46	54	32	46	45	47
Alice (HWW)	40	38	52	58	55	50	49	45	46
Danby (HWW)	47	40	50	46	50	41	46	44	.
Darrell	43	37	50	48	56	47	47	43	46
Ripper	44	35	44	53	49	43	45	43	.
Jagalene	26	30	33	41	42	31	34	36	42
Mean	51	46	57	56	56	55	54	48	47
CV	6	6	6	4	4	6	.	2	.
LSD.05	8	10	8	5	5	8	.	8	.

Table 3. Origin, variety traits, and disease reactions for winter wheat entries for 2007.

Variety	(Hdg.)*	Origin	----- Traits# -----				-- Disease Reaction + --							PVP
			Ldg Res	End-Use Qlty	Wntr Hardy Rtg	Cole-optile Pct##	Wht Strk Msc	Tan Spot	--- Rust \$ ---	Str	Lf	Lf^	Stm	
Wendy~HWW	(-1)	SD-04	E	GN	E	67	MS	R	MR	MS	6	MR	Yes	
Alice~HWW	(-1)	SD-06	G	EB	G	67	MR		MR	MS	4	MR	Yes	
Expedition	(0)	SD-02	F	EB	G-E	88	S	MS	MS	MS	7	R	Yes	
Overlay	(0)	KS-03	G	GB	F	92	MR	MR	R	MS	7	MR	Yes	
Wesley	(2)	NE-98	E	AB	G-E	79	S	MR	MR	MS	4	R	No	
Hatcher	(2)	CO-04	E	EB	F-G	92	S		MS	MS	6	MR	Yes	
Ripper	(2)	CO-06	E	EB	F-G	.	S		S	S	7	MS	Yes	
Arapahoe	(3)	NE-88	F	GB	G-E	83	S	S	MS	MR	2	MR	Yes	
Trego~HWW	(3)	KS-99	F-G	EB	F-G	80	S	MS	S	MS	7	R	Yes	
Danby~HWW	(3)	KS-05	G	EB	F-G	.	MS		R	S	6	MS	Yes	
Wahoo	(3)	NE/WY-01	G	AB	G	91	S		MR	S	5	R	Yes	
Jagalene	(3)	AW-02	E	AB	G	92	MS	MR	MR	S	9	MR	Yes	
Hawken	(3)	AW-07	E			.	MS	MR	MR	MR	3	MR	***	
NuDakota~HWW	(3)	AW-06	E	AB	G	.	MS	MR	MR	R	4	MR	Yes	
Millennium	(4)	NE-99	G	AB	F-G	78	S	MS	MR	MS	2	MR	Yes	
Tandem	(4)	SD-97	F-G	EB	G	112	S	S	MR	S	7	MR	Yes	
Overland	(4)	NE-06	E	AB	G	92	MS	MR	S	MR	1	MR	Yes	
Harding	(5)	SD-99	F-G	AB	E	100	MR	MR	MS	MR	2	MR	Yes	
Darrell	(5)	SD-06	G	AB	G	92	MS	MR	MR	MS	6	R	Yes	
Jerry	(6)	ND-01	F	GB	E	92	MS		MR	S	3	R	No	

\* Heading, the relative difference in days to heading, compared to Expedition.

~ HWW Hard white wheat variety.

# E= exc., A= accept., F= fair, G= good, P= poor, B= baking, N=noodles.

##Percent of Harding (3-1/4" long).

+ R= resistant, MR= moderately resist., MS= mod. susceptible, S= susc., VS= very susc..

\$ Rusts: Stripe (str), leaf (lf), and stem (stm).

^ 2007 field ratings for leaf rust, 1 = excellent, 9 = poor

\*\* Plant variety protection (PVP), title V, certification option - to be sold by variety name only as a class of certified seed.

\*\*\* PVP application pending or anticipated.

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