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2006 Winter Wheat Variety Yield Results and Planting Tips

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It was a tough year for winter wheat in South Dakota in 2006. The major winter wheat growing areas in the central and western part of the state suffered serious drought from planting until harvest. Most areas were very dry at planting, which delayed germination until rain came later in the fall. This led to plants with small crowns and little fall growth. Conditions did not improve in the spring with several locations having the driest January to June on record.

Yields from the Crop Performance Testing Program averaged 47 bu/A statewide, but many locations were not harvested due to the drought. Trials at Selby, Bison, Hayes, and Kennebec were too poor to be harvested for yield. Trials at Watertown, Platte, and Dakota Lakes had too much variation for yield results to be reported. The top performing varieties in East River in 2006 were NuDakota, Wesley, Nekota, Alliance, and SD98102; while Hatcher, SD98102, NuDakota, Harry, and Wahoo were best in West River.

The tables 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 3 years.

Drought causes winter wheat planting dilemma

The major winter wheat producing region of central and western South Dakota is experiencing severe drought,

making it difficult to decide whether to plant at all and if so, when to plant. Most of this region has no moisture in the top 3 to 4 feet, making it very difficult to make planting decisions.

Some planting scenarios (with potential problems) producers may opt to take:

1. **Delaying planting until it rains.** In South Dakota the recommended time to plant winter wheat is September 15 through October 10. Wheat plants should be well established before freezing to attain maximum cold tolerance and to accumulate enough energy reserves for the following spring.

Research from western South Dakota has shown that grain yield is decreased and that the crop suffers substantial winter injury when planting is later than October 15. Planting in November or even later may avoid winter injury (because germination is delayed until spring), but our research shows that yield is decreased and, in most cases, yields are lower than spring wheat yields.

Rather than planting late into November, producers may want to consider forgoing winter wheat this fall and, if soil moisture conditions improve, plant a spring crop next year.

2. **Planting into dry soil.** This has many potential problems. First, the minimum soil moisture required to germinate wheat seed is very low, meaning that even under dry conditions the seed can germinate. But if soil moisture is too low to support growth, seedlings will wilt and die, reducing crop stands. Second, the soil may be so

dry that germination will not occur till next spring. Again, producers may be better off waiting to see if soil moisture improves over winter and deciding whether to plant a spring crop. Remember also that seeding in dry soil increases risk of seed decay caused by soil-borne fungi.

3. Seeding winter wheat into standing stubble. In areas that may have adequate soil moisture to plant, standing stubble provides a better environment for wheat seed to germinate and seedlings to establish. The standing stubble traps snow over winter months, improving soil moisture conditions, and the trapped snow insulates wheat seedlings against cold temperatures, reducing risk of winter kill.

Seeding winter wheat into broadleaf-crops 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 conventional 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.

4. Manipulating seeding depth. The recommended seeding depth for winter wheat is of 1 1/2 to 2 inches in a firm seedbed. For direct seeding, a uniform depth of 1-1 1/2 inches under optimum moisture conditions will give a good stand.

Under dry conditions some producers may be tempted to seed deeper than 2 inches in hopes of getting closer to soil moisture. Planting deeper than 2 inches reduces emergence, however, and can result in weak, spindly seedlings with poor ability to survive the winter. Plant at the recommended seeding depth and 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.

5. Increasing seeding rates. - The recommended seeding rate is 22 pure-live-seeds per square foot (approximately 960,000 seeds/acre). Higher seeding rates are suggested when planting in poor seedbed or planting later than the recommended dates. If you choose to plant winter wheat this fall and you have assessed your seedbed as

Table 1. Hard winter wheat yield results - West River locations, 2004–2006 (bu/A).

Variety	Winner		Martin		Oelrichs		Sturgis		Wall		West River	
	2006	3-yr	2006	3-yr	2006	3-yr	2006	3-yr	2006	3-yr	2006	3-yr
SD98102	37	49	52	.	55	.	39	32	43	49	45	44
Hatcher	38	.	55	.	62	.	38	.	41	.	47	.
NuDakota (HWW)	37	.	50	.	58	.	31	.	47	.	45	.
Harry	39	.	44	.	60	.	36	.	46	.	45	.
Alliance	41	47	42	.	54	.	33	30	46	48	43	42
Expedition	37	40	44	.	56	.	33	28	46	45	43	3
Wahoo	35	46	45	.	61	.	36	30	48	53	45	43
Trego (HWW)	38	50	53	.	54	.	36	32	40	42	44	41
Wesley	34	39	48	.	52	.	34	29	42	44	42	37
SD97w609 (HWW)	39	47	47	.	52	.	37	27	45	45	44	40
Wendy (HWW)	38	47	48	.	49	.	33	27	46	46	43	40
Overland	38	.	44	.	52	.	28	.	46	.	42	.
NuFrontier (HWW)	38	.	46	.	57	.	35	.	44	.	44	.
Arapahoe	35	44	45	.	52	.	30	26	42	42	41	38
Millennium	31	46	43	.	56	.	32	32	41	48	41	42
Jagalene	41	52	42	.	57	.	38	31	42	47	44	43
Harding	37	48	40	.	52	.	33	28	42	48	41	41
Nekota	37	43	42	.	50	.	33	29	36	42	40	38
Tandem	36	44	44	.	51	.	35	29	45	46	42	40
Jerry	29	39	43	.	53	.	30	26	39	49	39	38
Overley	30	.	41	.	54	.	29	.	46	.	40	.
Crimson	37	41	42	.	51	.	33	27	34	43	39	37
Mean	37	45	45	.	54	.	33	29	43	46	43	40
CV	9.0	10.7	12.5	.	8.2	.	12.6	15.5	11.2	12.1	.	.
LSD.05	5.4	4.1	8.0	.	6.2	.	6.8	3.8	6.8	4.5	.	.

poor, increase seeding rate to 28 pure-live-seeds per square foot.

Evaluate your own farm situation and decide whether to plant winter wheat this fall or not. In our own assessment, most producers in the dry region of the state may be better off waiting till spring and deciding on which crop to plant based on the soil moisture then.

If planting this fall, plan on having a good weed control program. Weed problems are likely to increase when winter wheat growth is limited by drought stress. Controlling grassy weeds and volunteer wheat 2 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.

Table 2. Hard winter wheat yield results - East River Locations, 2004 - 2006 (bu/A).

Variety	Brookings		Highmore		East River		State	
	2006	3-yr	2006	3-yr	2006	3-yr	2006	3-yr
SD98102	84	68	42	66	63	67	50	52
Hatcher	78	.	46	.	62	.	50	.
NuDakota (HWW)	89	.	49	.	69	.	50	.
Harry	77	.	45	.	61	.	49	.
Alliance	81	65	48	67	64	66	49	51
Expedition	85	70	40	59	62	65	48	49
Wahoo	78	74	44	69	61	71	48	52
Trego (HWW)	72	58	51	62	62	60	48	49
Wesley	81	71	52	64	67	67	48	49
SD97w609 (HWW)	72	63	46	63	59	63	48	50
Wendy (HWW)	80	68	34	60	57	64	48	49
Overland	85	.	32	.	59	.	47	.
NuFrontier (HWW)	66	.	50	.	58	.	47	.
Arapahoe	82	69	45	67	63	68	46	49
Millennium	79	78	42	66	61	72	46	53
Jagalene	65	59	44	63	55	61	46	51
Harding	71	69	49	67	60	68	45	50
Nekota	76	63	54	63	65	63	45	46
Tandem	65	62	45	63	55	62	45	49
Jerry	78	79	42	66	60	73	45	50
Overley	81	.	26	.	53	.	44	.
Crimson	73	62	46	62	59	62	44	47
Mean	77	68	45	65	61	66	47	50
CV	8.6	12.6	13.2	7.7	.	.	10.7	14.9
LSD.05	9.3	6.9	12.0	4.3	.	.	2.6	1.8

Table 3. Origin, variety traits, and disease reactions for winter wheat entries for 2006.

Variety	(Hdg.)*	Origin	Test Wt	Ldg Res	----- Traits# -----			-- Disease Reaction + --						
					End-Use Qlty	Wntr Hardy Rtg	Cole-optile Pct##	Wht Strk Msc	Tan Spot	Str	- Rust \$ - Lf	- Rust \$ - Stm	PVP*	
Wendy~HWW	(-1)	SD-04	59	E	GN	E	67	MS	R	MR	MS	MR	Yes	
SD97W609~HWW	(-1)	SD-	59	G	EB	G	67	MR		MR		MR	***	
Expedition	(0)	SD-02	59	F	EB	G-E	88	S	MS	MS	MS	R	Yes	
Overley	(0)	KS-03	60	G	GB	F-G	92	MR	MR	R	MS	MR	Yes	
NuDakota~HWW	(1)	AW-06	57	E		G	.	MS	MR	MR	R	MR	Yes	
Alliance	(2)	NE-93	58	G	AB	G	76	MS	VS	MR	S	MS	Yes	
Nekota	(2)	NE/SD-94	59	G	GB	G	87	MS	MR	S	S	MR	No	
Wesley	(2)	NE-98	57	E	AB	G-E	79	S	MR	MR	MS	R	No	
Hatcher	(2)	CO-04	59	E	EB	F-G	92	S		MR	MR	MR	Yes	
Arapahoe	(3)	NE-88	59	F	GB	G-E	83	S	S	MS	MR	MR	Yes	
Trego~HWW	(3)	KS-99	60	F-G	EB	F-G	80	S	MS	S	MR	R	Yes	
Wahoo	(3)	NE/WY-01	58	G	AB	G	91	S		MR	S	R	Yes	
Jagalene	(3)	AW-02	60	E	AB	G	92	MS	MR	MR	MS	MR	Yes	
Millennium	(4)	NE-99	59	G	AB	F-G	78	S	MS	MR	MS	MR	Yes	
Tandem	(4)	SD-97	60	F-G	EB	G	112	S	S	MR	S	MR	Yes	
Overland	(4)	NE-06	59	E	AB	G	92	MS	MR	S	MR	MR	***	
NuFrontier~HWW	(4)	AW-05	60	G		G	87	MS	MS	MR	MS	MR	Yes	
Crimson	(5)	SD-97	59	G	GB	G-E	110	MR	R	MR	S	MS	Yes	
Harding	(5)	SD-99	59	F-G	AB	E	100	MR	MR	MS	MR	MR	Yes	
SD98102	(5)	SD-	60	G	AB	G	92	MS	MR	MR	MS	R	***	
Harry	(5)	NE-03	56	F	AB	G	83	S			MR	MR	Yes	
Jerry	(6)	ND-01	59	F	GB	E	92	MS		MR	S	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).

** 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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