iGrow℠
A Service of SDSU Extension

agronomy

AUGUST 2011

PLANT SCIENCE

2011 Winter Wheat Variety Yield Results

John Rickertsen | Research Associate, SDSU West River Ag Center, Rapid City
Bill Berzonsky | Plant Breeder, SDSU Winter Wheat Breeding Program, Brookings

It was an average year for winter wheat production in South Dakota. The crop had many obstacles to overcome to make it to harvest. Some areas suffered from winter kill and spotty stands, and then endured very wet spring conditions. The main problems were the many diseases that attacked the crop throughout the growing season. Wheat viral diseases were prevalent in 2011 including wheat streak mosaic, barley yellow dwarf, and a couple of emergent diseases – high plains disease and triticum mosaic – which are vectored by the wheat curl mite. Wet conditions also favored the development of root/crown rot and poor root growth. Wheat scab (fusarium head blight) was a problem for susceptible varieties such as Wesley, where high levels of vomitoxin in the grain have been reported. Tan spot and septoria were favored by the very wet conditions and along with the bacterial diseases once again being a major occurrence on wheat leaves and heads. There certainly were some yield and/or test weight losses occurring due to disease damaged flag leaves. Harvest was hampered by rainy and humid conditions in July and early August. This made it difficult to get the grain dry enough to harvest and frequent rains on the ripe grain also contributed to lower test weights this year.

Yields from the Crop Performance Testing Program averaged 53 bu/A statewide, ranging from 29 bu/A at McLaughlin to 77 bu/A at Brookings. The results for Bison and South Shore are not reported due to hail at Bison and high yield variation at South Shore. The top performing varieties East River in 2011 were SY Wolf, Overland, Settler CL, SD05118-1, Expedition Millennium and Wesley; while Lyman, Expedition, Settler CL, SY Wolf, Overland, Everest and Millennium did the best in West River. The varieties Expedition, Overland, Settler CL, Wesley, SD05118-1, Millennium and Lyman had the best three-year statewide average yields.

Changes to the variety recommendations include dropping Darrell, Harding, Hatcher and Wendy from the recommendations and moving Art and Settler CL up from the acceptable/promising to the recommend list.

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. The Winner and Brookings sites had two trials, one had foliar fungicide applied at flowering and other had no fungicides applied.

Recommended varieties for 2012

Recommended:

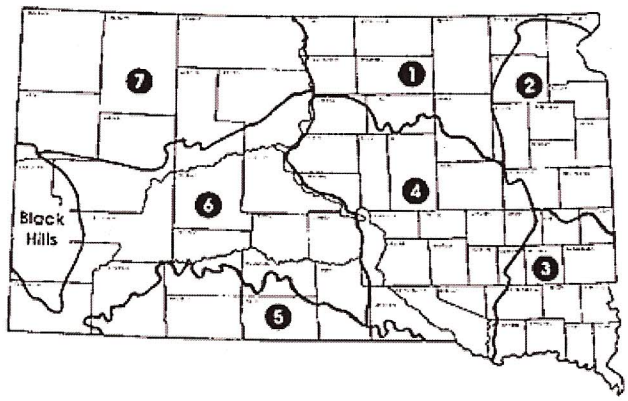
Variety	Crop Adaptation Area
Alice (white) PVP	1 pc,4 pc ,5,6,7 pc
Art PVP	1 pc, 2 pc,3,4 pc
Expedition PVP	1 pc, 2pc, 3, 4pc
Lyman PVP	1 pc, 2 pc,3,4 pc,5,6,7 pc
Millennium* PVP	1 pc,4 pc ,5,6,7 pc
Overland PVP	1pc,3,4pc,5,6,7pc
Settler CL* PVP	5,6,7 pc
Smoky Hill * PVP	5,6,7 pc

Acceptable/Promising:

Variety	Crop Adaptation Area
Hawken* PVP	3,4 pc,5,6
Wesley*	5,6,7 pc

Crop Adaptation Areas for South Dakota

(Revised 1992)



* *Varieties susceptible to Fusarium Head Blight (Scab): Harding, Hawken, Millennium, Settler CL, Smoky Hill, Wesley. Varieties moderately resistant to Fusarium Head Blight (scab): Lyman, Art*

PVP U.S. Plant Variety Protection applied for and/or issued; seed sales of these varieties are restricted to classes of certified seed.

pc Plant into protective cover.

Table 1

Hard winter wheat yield results - West River Locations, 2009 – 2011 (bu/A).

	Location Yield Avg. (bu/a at 13% moist.)															West Yield Avg. (bu/a)		State Yield Avg. (bu/a)		West River TYG %	
	Mclaughlin		**Sturgis**		**Wall**		**Hayes**		**Kennebec**		**Martin**		**Winner**								
Variety	2011	3-Yr	2011	3-Yr	2011	3-Yr	2011	3-Yr	2011	3-Yr	2011	3-Yr	Fung*	2011	3-Yr	2011	3-Yr	2011	3-Yr	2011	3-Yr
Alice	26		61	62	65	48	51	56	37	40	57		48	42		48	52	51	55	0	0
Arapahoe	**37**		**72**	**65**	61	47	55	58	41	45	52		53	41		51	54	53	56	25	50
Art	22		58	59	**66**	45	51	57	39	40	51		56	37		46	50	52	58	12	0
Camelot	21		61		**66**		52		39		55		48	38		47		51		12	-
Darrell	29		64	64	53	46	57	**62**	41	48	58		46	39		48	55	50	57	0	50
Everest	28		**67**		68		55		**46**		**67**		**58**	**45**		54		56		62	-
Expedition	35		**68**	**66**	**76**	**54**	**64**	**65**	**52**	47	**68**		52	**44**		58	58	59	62	75	100
Fuller	14		**67**	63	59	41	**59**	58	35	40	66		46	38		48	51	50	55	25	0
Harding	29		61	60	64	48	48	56	42	46	56		45	28		47	52	48	54	0	1
Hawken	15		**66**	61	62	49	**58**	**61**	35	42	64		48	43		49	53	53	57	25	25
Jagalene	18		60	59	60	45	54	55	34	40	54		45	35		45	50	44	52	0	0
Jerry	**42**		65	62	56	48	55	57	29	40	48		48	39		48	52	50	53	12	0
Lyman	**42**		**77**	**69**	64	46	**58**	**62**	**53**	50	65		**66**	**51**		59	56	58	59	75	75
WB Matlock	**40**		62		61		49		34		51		47	41		48		51		12	-
McGill	29		64		62		51		34		60		50	42		49		53		0	-
Millennium	35		**71**	**66**	65	**51**	55	59	**48**	48	57		54	39		53	56	56	59	25	75
Overland	35		**72**	**68**	**73**	**55**	56	60	**49**	45	**68**		49	40		56	57	60	62	50	75
Settler CL	28		**77**	**65**	**74**	**53**	**63**	**65**	**50**	45	64		**58**	41		57	57	58	60	62	100
Smoky Hill	22		50	56	**73**	**51**	57	**61**	**47**	48	61		46	**44**		51	54	54	58	12	75
Wesley	28		**71**	**68**	65	50	57	59	**46**	48	59		51	38		52	56	55	60	25	75
Robidoux	22		60		65		51		35		60		42	39		47		50		0	-
SY Wolf	33		**75**		56		**59**		**49**		**78**		**60**	**44**		56		61		62	-
SD05118-1	**37**		60	63	62	49	**58**	**61**	45	47	66		49	39		52	55	56	59	25	50
Test Average	29		65	63	63	49	55	59	43	45	60		51	40		51	54	53	58		
LSD (0.05) #	5		11	4	10	4	6	4	7	6	11		8	7		--	--	--	--		
TYG value ##	37.0		66	65	66	51	58	61	46	44	67		58	44		--	--	--	--		
C.V. ###	11.3		10.7	8.3	10.7	9.7	8.1	8.9	10.2	16.6	11.1		11.7	11.6		--	--	--	--		

If the difference between two varieties within a column equals or exceeds the LSD value, the difference is significant; if not, the difference is nonsignificant(NS) at the 0.05 level of probability.
Minimum value required for variety to qualify for the top yield group (TYG).
A measure of experimental error, 15% or less is best for yield.
* Fung = Trial had foliar fungicide applied
Bolded yields indicates values within a column that qualify for the top yield group (TYG).

Table 2

Hard winter wheat yield results - East River Locations, 2009 - 2011 (bu/A).

	Location Yield Avg. (bu/a at 13% moist.)														East Yield Avg. (bu/a)		State Yield Avg. (bu/a)		East River TYG %	
	Selby		Brookings			Beresford		Platte		Pierre		Onida								
Variety	2011	3-Yr	Fung*	2011	3-Yr	2011	3-Yr	2011	3-Yr	2011	3-Yr	2011	3-Yr		2011	3-Yr	2011	3-Yr	2011	3-Yr
Alice	51	67	72	68	63	49		38	54	68	56	49	51		54	58	51	55	0	0
Arapahoe	53	69	74	71	**64**	47		**44**	59	67	53	48	48		55	58	53	56	16	0
Art	52	**71**	**84**	**82**	**74**	35		51	63	78	59	48	50		58	63	52	58	50	40
Camelot	50		**82**	78		51		41		74		42			56		51		16	-
Darrell	**55**	**71**	67	59	60	43		37	55	76	57	41	49		52	58	50	57	16	20
Everest	51		**87**	**89**		43		**45**		75		50			59		56		50	-
Expedition	**57**	**73**	**81**	78	**72**	46		**51**	67	74	**61**	56	**54**		60	65	59	62	50	100
Fuller	44	69	69	65	**66**	46		40	54	75	59	45	50		52	59	50	55	0	20
Harding	52	70	66	56	59	47		34	51	64	51	40	44		49	55	48	54	0	0
Hawken	**59**	**71**	75	59	59	54		39	56	**83**	**61**	50	52		57	60	53	57	33	40
Jagalene	42	64	68	45	49	33		28	53	75	57	36	48		43	54	44	52	0	0
Jerry	53	70	73	65	63	55		38	50	62	47	42	45		53	55	50	53	16	0
Lyman	**55**	70	67	65	**66**	48		**44**	61	72	55	61	**54**		57	61	58	59	33	20
WB Matlock	**55**		74	69		57		38		62		42			54		51		16	-
McGill	**57**		76	72		47		**51**		68		55			58		53		33	-
Millennium	**60**	**72**	80	73	**64**	44		**47**	61	**84**	**62**	53	51		60	62	56	59	50	40
Overland	**57**	69	**81**	73	**68**	57		**51**	65	**87**	**66**	58	**57**		64	65	60	62	66	80
Settler CL	**55**	70	**85**	78	**70**	50		**44**	59	78	60	60	**56**		61	63	58	60	50	40
Smoky Hill	53	**75**	74	53	55	45		**45**	61	**87**	**64**	60	**55**		57	62	54	58	33	60
Wesley	**57**	68	80	71	**67**	42		**42**	61	**85**	60	55	**54**		59	62	55	60	50	40
Robidoux	46		**89**	71		45		36		70		46			52		50		16	-
SY Wolf	**57**		**88**	**83**		42		**50**		**90**		**73**			66		61		100	-
SD05118-1	**59**	**77**	80	70	**71**	51		**43**	59	**87**	59	52	50		60	63	56	59	50	40
Test Average	53	71	77	70	64	47		42	58	76	58	51	51		56	60	53	58		
LSD (0.05) #	6	6	8	8	7	NS		9	5	9	4	10	4		--	--	--	--		
TPG value ##	54	71	81	81	67	-		42	62	81	61	63	53		--	--	--	--		
C.V. ###	8.5	10.4	7.5	8.4	12.8	17.3		15.4	11.1	8.3	8.8	13.5	9.9		--	--	--	--		

If the difference between two varieties within a column equals or exceeds the LSD value, the difference is significant; if not, the difference is nonsignificant(NS) at the 0.05 level of probability.
Minimum value required for variety to quality for the top yield group (TYG).
A measure of experimental error, 15% or less is best for yield.
* Fung = Trial had foliar fungicide applied
Bolded yields indicates values within a column that quality for the top yield group (TYG).

Table 3

Origin, agronomic traits and disease reactions for winter wheat entries for 2011.

Variety	Origin (Year)[1]	Relative Heading[2]	Lodging Resist[3]	Test Weight	Protein Percent	Height Inches	End-use Qlty[3]	Winter Hardy Rtg[3]	Wheat Streak Mosaic[4]	Tanspot[4]	Rust[5]			FHB (Scab) Rating[5]	PVP Status**
											Stripe	Leaf	Stem		
Alice ~W	SD (06)	-1	G	53.0	12.4	33	EB	G	MR+	MS+	-	MS	MR	3	Yes
Art	AP (08)	0	E	53.2	12.6	33	-	G	S	MR	R	R	MR	3	Yes
+Everest+	KS (09)	0	E	54.9	12.8	32	AB	G	MS	MS	MR	MR	MS	-	Yes
Expedition	SD (02)	0	F	54.5	12	37	GB	G-E	S	MS	MS	S	R	3	Yes
Fuller	KS (07)	0	E	51.4	12.6	33	AB	P-F	S	MR	MR	R	R	3	Yes
Camelot	NE (08)	2	G	52.1	12.7	36	EB	G	S	-	MR	MR	MR	5	Yes
Lyman	SD (08)	2	F	55.2	12.7	36	AB	G	S	MR	MS	R	R	2	Yes
+McGill+	NE (10)	2	G	51.1	11.8	37	AB	G	S	-	S	MR	MR	-	Yes
+Robidoux+	NE (10)	2	G	50.8	12.1	35	GB	G	-	-	S	MS	MR	-	Yes
Smoky Hill	WB (07)	2	G	52.5	11.5	33	EB	G	S	MR	R	MR	MR	5	Yes
Wesley	NE (99)	2	E	51.9	12.7	32	GB	G-E	S	MR	MR	MR	R	5	No
Arapahoe	NE (88)	3	F	53.0	12.5	38	GB	G-E	S	S	MS	MR	MR	2	Yes
Hawken	AP (07)	3	E	52.0	12.5	31	AB	G	MS	MR	MS	R	MR	4	Yes
Jagalene	AP (01)	3	E	51.2	12.3	33	AB	G	MS	MR	MR	S	MR	5	Yes
+SY Wolf+	AP (10)	3	G	52.7	12	33	-	G	-	MR	MS	MR	-	-	Yes
Settler CL	NE (08)	3	G	53.3	11.4	35	AB	G	S	-	MS	MS	MR	5	Yes
Millennium	NE (00)	4	G	54.1	12.3	37	AB	F-G	S	MS	MR	MR	MR	5	Yes
Overland	NE (06)	4	G	54.1	11.7	37	FB	E	-	-	R	R	MS	3	Yes
+WB Matlock+	WB (10)	4	G	53.7	13.2	38	-	G-E	-	MS	MS	MR	MR	-	Yes
Darrell	SD (06)	5	G	52.4	12.5	36	EB	G	MR	MS	-	S	R	3	Yes
Harding	SD (99)	5	F-G	52.6	13.2	39	AB	E	MR	MR	MS	MR	MR	4	Yes
Jerry	ND (01)	5	F	52.6	12.7	40	GB	E	MS	-	MR	MR	R	3	No

+New variety+ to the 2010 CPT

~ W, Hard white wheat variety.

[1] AP=Agripro, CN=Canada, CO=Colorado, KS=Kansas, NE=Nebraska, ND=North Dakota, SD=South Dakota, WB=WestBred

[2] Heading, the relative difference in days to heading, compared to Expedition.

[3] E= exc., A= acceptable, F= fair, G= good, P= poor; B= baking, N=noodles.

[4] R= resistant, MR= moderately resist., MS= mod. susceptible, S= susc., VS= very susc.

[5] 1= tolerant, 5=susceptible

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