

Motion Three : Winter Triticale variety release 2004.

by Dave Wichman

Move that winter triticale line **SR94719** be release by the Montana Agricultural Experiment Station for grain production. It is recommended that this variety be grown in environments with moderate winters as it has not had extensive winter hardiness evaluations. It has been evaluated at the CARC since crop year 1995 and has had good stand survival every year at Moccasin. **SR94719** is not the highest yielding line in the current test. It will be a short term variety (one to two years). Current selections have higher yield potential, but lack genetic stability and/or lack the exposure to average or more severe winter conditions that are needed for accurate assessment of adaptation. Foundation seed of the newer high yielding lines are two to three years off. Two acres of SR94719 were seeded at CARC in October 2003 to produce foundation seed. Foundation seed would be available the fall of 2004. PVP status is not recommended.

SR94719 originates from material received from Matt Kolding, retired Oregon State University agronomist. It has been evaluated in trials at Bozeman and Moccasin since 1995 and at Huntley, Sidney and Sheridan more recently. It has exhibited good genetic stability with uniform plant appearance. It has exhibited excellent adaptation and winter survival at all test locations for the years it was evaluated. Its rank across all statewide trials seeded at Bozeman, Huntley, Moccasin, and Sheridan in 2003, 2002, and 2001 was 18th, 14th, and 2nd, respectively (See Tables 1,2,3). Its production has been similar to Tiber winter wheat. In the first test years its yields were generally above the mean of the trials and has fallen below the mean of the nursery in recent years (Table 4). **SR94719** has exhibited good winter survival in the yield trials (no data) and had respectable survival ratings in Moccasin's (1997) and Williston's (2003) winter hardiness evaluations (Tables 6 & 7).

SR94719 has also exhibited high forage production potential as demonstrated at Moccasin in 2002. It produced 3.452 tons per acre of dry matter on dryland fallow. That was the second highest yield in a trail with 16 entries (Table 8).

Table 1 **2003 Winter triticale grain nursery multi-location mean yield.**
 Exp WTG3 Montana & Wyoming Agricultural Experiment Station.

ID	Pedigree	Trt	Bozeman	Moccasin	Sheridan	Average
			lbs/a	lbs/a	lbs/a	lbs/a
K943	KT943112	21	5378	2341	4561	4093
KT119	K99SRT119	19	4917	2795	4543	4085
KT84	91T113-C12-5	4	6473	2755	2999	4076
KT0107	KT940872p8006	20	5197	2176	4756	4043
KT09	KW941531-6005	12	5793	2679	3620	4031
T35	KT941289	5	5753	2633	3478	3955
KT35	KT941256-8007	1	6055	2466	2999	3840
TR19	SR94721	18	4805	1966	4667	3813
KT991	KT991034	17	4769	2236	4366	3790
KT0111	KT941276-8004	15	5572	2382	3407	3787
WW1	Tiber	13	5101	2448	3631	3727
KT990	KT990174	11	4951	2666	3443	3687
KT3	KT941864-5002	3	5378	2466	3088	3644
KT0102	D98SRT99-3	14	5268	2025	3549	3614
KT0108	KT940874p8012	8	5557	1934	3141	3544
KT0109	KT940608p9029	9	5212	2357	2999	3523
KT0116	KT981146p9036	16	4619	2173	3461	3418
TR18	SR94719	2	5237	2073	2875	3395
KT0106	KT940608p9003	10	4812	2247	3106	3388
KT91	KT941776-5002	6	5299	2121	2744	3388
TD01	Trical 102	7	4177	1859	2957	2998
OVERALL MEAN =			5253	2323	3542	3706
CV (S/MEAN) % =			5.3	6.679	11.19	
LSD(0.05 by t)=			462	323.7	560.8	

Table 2 2002 Multi-location grain yield performance of winter triticale.

Exp SWTG Test locations Bozeman, Moccasin and Sheridan.

ID	Pedigree	Bozeman	Moccasin	Sheridan	Average
code		lbs/a	lbs/a	lbs/a	lbs/a
KT84	91T113C125	5139	2472	1343	2985
KT25	92E005	4858	2459	1409	2909
K809	KW941531-6005	4352	2513	1151	2672
KT35	KT941256	4480	2516	1010	2669
KT32	KT941289	4437	2285	1121	2614
K940	KT943112	4465	2337	911	2571
WW	Tiber	4022	2392	1219	2544
KT119	K99SRT119	4098	2282	979	2453
KT27	KT940794	4247	2086	989	2441
K944	KT940874-8001,2,3,	4447	1932	932	2437
KT06G	99SRT6	4314	1920	977	2404
KT3	KT941864	3923	2342	880	2382
KT33	KT941776	3699	2331	997	2342
TR18	SR94719	3616	2237	962	2272
K950	KT941276-8004	3919	1969	803	2230
KT30	KT940874-8002	3576	1812	716	2035
Mean		4218	2243	1025	2495
CV		8.5	9.274	15.04	
LSD	0.05	4.28**	346.8	257	

Table 3 2001 Multi-location winter triticale variety trial grain yields.

Test locations Bozeman, Huntley, Moccasin, and Sheridan

ID	Cultivar/Line	Bozeman	Huntley	Moccasin	Sheridan	Average
		lbs/a	lbs/a	lbs/a	lbs/a	lbs/a
PI517194 Tiber (WW Check)		4804	2490	2750	1686	2932
TR18	SR 94719	5106	2260	2588	1616	2892
T34	Ugo	5280	2184	2542	1550	2889
TR01	91T113-C12-5	4593	2235	2842	1844	2879
KT3	KT941864-5002	5509	1916	2371	1676	2868
KT35	KT941256-8004	4715	2553	2493	1536	2824
KT33	KT941776-5002	4844	2365	2498	1516	2806
T37	RAH371-F93	4921	1808	2775	1682	2796
KT27	KT940794-8007	4890	2274	2529	1388	2770
T26	B0010	5260	1690	2587	1412	2737
TR 98	Frostat	5026	2126	2294	1108	2638
T35	RAH173-F93	4490	1726	2588	1706	2627
KT30	KT940874-8002	5262	1401	2409	1334	2601
KT119	K99SRT119 (white)	4092	1550	2654	1479	2444
KT103	K99SRT103	3917	1599	2229	1528	2318
KT25	KW940393W5001a	4404	2671			0
Average		4819.5	2052.9	1550	1550	2493
C.V.		11.7	40.8	9.246	9.246	
LSD (0.05)		ns	ns	465	238.9	

Table 4 Winter triticale yields of line TR94719 yield, nursery mean, and Tiber winter wht. Data collected from trials at Bozeman, Huntley, Moccasin, Sidney and Sheridan.

	SR94719 lbs/a	Nursery lbs/a	Difference lbs/a	Tiber lbs/a
1995 Moccasin TRHN	2970	2325	645	2111
1996 Moccasin TRHN	1896	1809	87	2116
1997 Moccasin TRHN	5470	4774	696	4395
1998 Moccasin TRHN	4683	4154	529	4660
1999 Huntley SWTR08	3107	3821	-714	4131
1999 Mocc SWTR07	3545	3856	-311	3394
1999 Mocc SWTR70	2916	2826	90	2184
1999 Sidney SWTR03	4573	4404	169	3517
1999 Boz SWTR01	6034	6891	-857	5878
2000 Huntley SWTR08	3271	3357	-86	2890
2000 Mocc SWTR70	2639	2886	-247	2159
2000 Boz TR01	5119	6178	-1059	4985
2000 Winifred	1858	2265	-407	1778
2001 Mocc SWTR07	2588	2536	52	2750
2001 TRWinSurMocc	2504	2520	-16	2057
2002 Mocc SWTR70	1388	1384	4	1433
2002 MoccSWTR07	2237	2243	-6	2392
2002 Boz SWTR01	3616	4218	-602	4022
2002 Sheridan WTG	962	1025	-63	1219
2003 Boz SWTR01	5237	5253	-16	5101
2003 Shrdn WTG03	2875	3542	-667	3631
2003 Mocc SWTG07	2073	2323	-250	2448
Average:	3253	3390	-138	3148

Regression Stats Y=0.888 X +239	
Multiple R	0.9587
R Square	0.9192
Adjusted R Sq.	0.9159
Standard Error	389.9379
Observations	27

Nursery SR94719	
mean Yield	Yield
lbs/a	lbs/a
1500	1571
3750	3569
6000	5567

ANOVA

	df	SS	MS	F	Significance F
Regres	1	43233439.61	43233440	284.3341	3.62599E-15
Resid	25	3801288.687	152051.5		
Total	26	47034728.3			

	Coefficients	Standard Error	t Stat	P-value
Intrcpt	239.6219897	181.9379044	1.317054	0.199766
X	0.888196165	0.052673772	16.86221	3.63E-15
Variab				

	Lower 95%	Upper 95%
Intrcpt	-135.086	614.3299
X Variab	0.779713	0.99668

Table5 2003 Winter triticales protein on a dry seed basis.

Location:		Boz	Shrdn	Location:		Boz	Shrdn
		%	%			%	%
KT35	KT941256-8007	15.8	11.7	KT09	KW941531-6005	15.3	10.6
TR18	SR94719	16.4	12.0	WW1	Tiber	17.6	13.6
KT3	KT941864-5002	15.6	11.0	KT0102	D98SRT99-3	17.8	14.5
KT84	91T113-C12-5	14.6	10.9	KT0111	KT941276-8004	17.8	13.5
T35	KT941289	15.1	11.1	KT0116	KT981146p9036	17.9	11.8
KT91	KT941776-5002	16.2	13.4	KT991	KT991034	16.5	13.8
TD01	Trical 102	17.1	12.6	TR19	SR94721	16.7	13.5
KT0108	KT940874p8012	17.6	12.5	KT119	K99SRT119	15.4	11.5
KT0109	KT940608p9029	18.7	12.6	KT0107	KT940872p8006	15.7	11.8
KT0106	KT940608p9003	17.4	12.0	K943	KT943112	16.2	12.2
KT990	KT990174 white	15.0	11.4				
					average	16.5	12.3

Table 5A 2002 Winter triticales protein on a dry seed basis.

ID	Variety or line	Bozeman	Moccasin
		%	%
K940-K810	KT943112	18.3	15.9
K944	KT940874-8001,2,3	18.6	18.4
KT25	92E005	17.5	16.4
KT32	KT941289	18.0	16.3
KT33	KT941776	18.7	16.3
KT119	K99SRT119	18.2	15.6
WW	Tiber	18.9	15.3
TR18	SR94719	18.3	15.2
KT30	KT940874-8002	18.8	20.3
KT3	KT941864	18.4	17.8
TR01	91T113C125	16.9	17.5
KT06G	99SRT6	19.3	20.4
K950	KT941276-8004	18.7	17.8
K809	KW941531-6005	18.5	16.7
KT27	KT940794	18.6	18.5
KT35	KT941256	18.5	16.4

Table 6 2001 Winter Survival of Triticale. Seeded on west facing slope.
Central Agricultural Research Center, Moccasin, MT

	Stand	STAND	HEAD
	6/4/2001	4/30/2001	DATE
	%	plts/3'	d of Y
KT941256-8007	100	48	171
KT941864-5002	100	49	172
KW940393W5001a	100	54	166
B0010	100	46	176
RAH 371-F93	100	45	167
KT940794-8007	98	62	168
KT940874-8002	98	51	164
91T113-C12-5	98	52	163
SR94719	97	48	176
UGO	97	51	170
Frostat	95	28	170
RAH 173-F93	95	41	168
K99SRT103	90	47	166
KT941256-8006	90	48	171
K99SRT119 whitesd (3-7-00sding)	90	51	164
Tiber	80	59	175
Rampart	70	37	176

Table 7 . 2003 Statewide triticales winter survival at Williston.

Rating 0-9 with 0 being none survived

Entry #	ID1	Variety or Line	2 reps 16-May
18	TR98	FROSTAT	4.8
13	FWW11	FW11	4.5
2	TR18	SR94719	4.3
8	KT0108	KT940874p8012	4.0
11	KT990	KT990174	4.0
20	KT0107	KT940872p8006	3.8
10	KT0106	KT940608p9003	3.5
9	KT0109	KT940608p9029	3.3
19	FRNK	Frank Spelt	3.0
3	KT3	KT941864-5002	2.8
6	KT91	KT941776-5002	2.5
15	KT983	KT98SRT30	2.5
17	WNTRNS	Winterness	2.5
5	T35	KT941289	2.3
21	K943	KT943112	2.3
4	KT84	91T113-C12-5	2.0
12	KT09	KW941531-6005	2.0
16	KT981	KT981146p9033	2.0
14	KT982	KT982022	1.8
7	TD01	Trical 102	1.5
1	KT35	KT941256-8007	1.3
Average			2.9
LSD (0.05)			1.5
C.V. (%)			25.4
P-value (Varieties)			0.0016

Nearest winter wheat checks rated: Morgan = 5.5, BigSky = 4.5, Rampart = 1.5

Table F 22 2002 Winter triticale statewide nursery on no-till fallow in
 NW8
 Exp. TRSW Central Agricultural Research Center, Moccasin, MT

ID	Pedigree	Plant Height	Heading Date	Forage Yield	Grain Yield	Test Wt
			d of y	t/a	lbs/a	lbs/b
KT25	92E005	30.8	172	3.589	2459	52.0
TR18	SR94719	34.4	177	3.452	2237	47.8
K940-K81	KT943112	29.3	174	3.427	2337	52.0
KT33	KT941776	33.9	174	3.384	2331	51.4
K809	KW941531-6005	29.3	174	3.352	2513	52.3
TR01	91T113C125	37.2	167	3.343	2472	53.2
KT30	KT940874-8002	36.4	177	3.299	1812	46.0
KT3	KT941864	33.7	174	3.207	2342	50.2
KT32	KT941289	34.8	173	3.174	2285	51.9
KT27	KT940794	35.6	173	3.152	2086	51.2
KT119	K99SRT119	35.5	173	3.123	2282	52.9
KT35	KT941256	34.0	176	2.861	2516	51.5
KT06G	99SRT6	31.1	176	2.857	1920	52.7
K944	KT940874-8001, 2, 3	31.9	175	2.844	1932	48.2
WW	Tiber	32.3	177	2.431	2392	61.0
K950	KT941276-8004	29.2	177	2.294	1969	49.1
OVERALL MEAN		33.08	174.26	3.11	2243	51.45
CV (S/MEAN) %		10.08	0.30	13.00	9.27	3.86
LSD(0.05 by t)		5.56	0.87	0.67	346.8	3.31

Table 7 . 2003 Statewide triticales winter survival at Williston.

Rating 0-9 with 0 being none survived

Entry #	ID1	Variety or Line	2 reps 16-May
18	TR98	FROSTAT	4.8
13	FWW11	FW11	4.5
2	TR18	SR94719	4.3
8	KT0108	KT940874p8012	4.0
11	KT990	KT990174	4.0
20	KT0107	KT940872p8006	3.8
10	KT0106	KT940608p9003	3.5
9	KT0109	KT940608p9029	3.3
19	FRNK	Frank Spelt	3.0
3	KT3	KT941864-5002	2.8
6	KT91	KT941776-5002	2.5
15	KT983	KT98SRT30	2.5
17	WNTRNS	Winterness	2.5
5	T35	KT941289	2.3
21	K943	KT943112	2.3
4	KT84	91T113-C12-5	2.0
12	KT09	KW941531-6005	2.0
16	KT981	KT981146p9033	2.0
14	KT982	KT982022	1.8
7	TD01	Trical 102	1.5
1	KT35	KT941256-8007	1.3
Average			2.9
LSD (0.05)			1.5
C.V. (%)			25.4
P-value (Varieties)			0.0016

Nearest winter wheat checks rated: Morgan = 5.5, BigSky = 4.5, Rampart = 1.5