PROJECT TITLE: Statewide Spring Wheat Variety Performance - 1999

PROJECT LEADER:

L. Talbert, Spring Wheat breeder, Bozeman

PROJECT PERSONNEL:

D.M. Wichman, CARC, Moccasin
J.L.A. Eckhoff, EARC, Sidney
G.R. Carlson, NARC, Havre
R.N. Stougaard, NWARC Kalispell
K. Kephart, SARC. Huntley
G.D. Kushnak, WTARC, Conrad

OBJECTIVE: To evaluate new and existing varieties and experimental lines of spring wheat under various growing conditions and environments in Montana.

RESULTS: The 1999 Advanced Spring Wheat yield trial was grown at three irrigated and seven rainfed sites across Montana. Irrigated sites were at Sidney , Huntley, and Bozeman. Replicated multiple-row plots were established at all locations using standard research techniques.

Heading date, plant height at maturity, grain protein contents, test weights, and yield are summarized in Tables 1,2, 3, 4, and 5, respectively. Soil moisture at **Sidney** was excellent at planting, and weather was cool and wet until July, resulting in high yields, but low proteins. Rainfall at **Havre** was above average during the growing season, and temperatures were cool through June. Hot weather with hot winds in July burned the developing crop, causing below average test weights, although yields were above average. Cool temperatures in **Kalispell** extended from March through June resulting in slow emergence and seedling growth but good tillering. While dry throughout the growing season, no moisture stress was noted as soil moisture never reached wilting point. Excellent yields were recorded with good test weights and average proteins in the absence of disease pressures and very light lodging damage. **Bozeman** had good soil moisture through mid June, then experienced very dry conditions until harvest. Temperatures remained normal. **Conrad** experienced below normal rainfall, but temperatures were also low, so the crop had normal yields and good test weights. Temperatures at **Moccasin** were slightly cooler than average during the early part of the growing season and above average during harvest, while precipitation during the growing season was below average. Soil moisture at **Huntley** was very good at planting because of above normal precipitation in April. Precipitation was below normal through July, and hot, dry winds burned the dryland spring wheat.

SUMMARY: Highest yielding lines on a statewide basis were BR2306, Zeke, and Reeder. Highest yielding varieties at individual sites were McNeal at **Havre**, MT9850 at **Moccasin**, BR2306 at **Huntley dryland**, MT9735 at **Conrad**, Reeder at **Sidney dryland**, Reeder at **Bozeman dryland**, Reeder at **Sidney irrigated**, Zeke at **Huntley irrigated**, MTHW9420 at **Bozeman irrigated**, and BR2306 at **Kalispell** (high rainfall).

FUTURE PLANS: New and existing varieties and experimental lines will continue to be evaluated at Bozeman and the Research Centers in Montana, so that breeders can release improved varieties and producers can have information on varieties best adapted to conditions in their areas.

TABLE 1. HEADING DATE (JULIAN DAYS 175=JUNE 24) SUMMARY FOR THE ADVANCED SPRING WHEAT NURSERY GROWN ACROSS MONTANA, 1999

VARIETY OR ID	HAVRE DRY	MOCCASIN DRY	HUNTLEY DRY	CONRAD DRY	SIDNEY DRY	BOZEMAN DRY	SIDNEY IRR	HUNTLEY IRR	BOZEMAN IRR	KALISPELL HI-RAIN	AVG	RANK	BYX	RSQ
BR 2306	176	185	168	182	169	182	169	168	182	173	175.3	18	1.10	0.98
Zeke	175	181	165	181	165	180	168	165	178	170	172.7	2	1.06	0.95
Pristine	176	180	166	180	165	179	166	164	178	170	172.4	1	1.02	0.93
Conan	175	183	167	181	169	182	171	167	180	173	174.8	11	0.99	0.98
BZ996472	175	181	166	181	167	178	168	165	177	170	172.7	3	0.97	0.95
THATCHER	175	188	171	185	173	185	174	171	183	179	178.4	48	1.01	0.96
FORTUNA	174	184	169	182	170	182	172	167	182	175	175.7	24	1.00	0.99
LEW	175	188	172	184	174	186	173	171	183	179	178.5	49	0.98	0.97
NEWANA	175	187	171	183	173	186	174	169	185	178	178.2	47	1.03	0.96
MT 9675	175	188	171	183	173	185	174	171	185	178	178.2	46	1.00	0.97
MT 9706	174	185	170	182	171	182	172	168	182	173	176.0	29	0.98	0.98
MT 9712	175	183	168	182	171	182	171	167	180	175	175.4	20	0.95	0.99
MT 9715	174	185	170	183	171	182	171	167	182	174	176.0	27	1.01	0.98
MT 9719	174	183	168	183	169	182	171	168	181	173	175.3	16	1.00	0.98
MT 9720	174	185	170	183	171	185	172	169	182	176	176.7	37	1.03	0.99
MT 9735	176	186	171	182	172	182	173	168	182	175	176.6	35	0.94	0.99
MT 9739	175	182	169	183	171	181	171	166	180	176	175.3	17	0.95	0.97
MT 9748	174	185	169	183	169	183	172	167	182	175	175.9	25	1.07	0.99
MT 9754	174	185	169	183	169	182	170	167	182	174	175.6	21	1.09	1.00
MT 9755	175	181	167	181	169	181	170	165	180	172	174.0	7	0.99	0.97
MT 9771	175	184	170	183	171	182	172	167	181	177	176.1	30	0.98	0.99
MT 9772	175	183	169	182	170	182	171	167	181	177	175.7	22	0.96	0.99
MT 9801	176	186	171	183	172	183	172	169	183	177	177.2	40	0.98	0.99
MT 9802	175	183	168	181	169	182	172	167	181	174	175.1	14	0.97	0.98
MT 9806	175	185	170	182	170	182	172	170	181	175	176.2	31	0.92	0.98
MT 9807	175	183	169	182	169	181	170	168	181	174	175.3	15	0.96	0.99
MT 9813	174	184	169	182	170	182	172	170	181	175	175.9	26	0.91	0.99
MT 9815	175	186	170	184	172	182	172	167	182	177	176.6	36	1.03	0.98
MT 9834	175	186	171	184	173	183	172	171	183	179	177.7	43	0.93	0.96
MT 9835	175	182	167	180	168	181	169	165	180	172	173.8	5	1.02	0.98
MT 9836	174	183	167	181	169	181	171	167	180	173	174.6	8	1.00	1.00
MT 9849	174	187	171	183	173	185	172	170	183	178	177.7	42	1.01	0.96
MT 9850	174	186	170	184	170	182	172	167	182	178	176.5	34	1.05	0.97
MT 9866	174	185	171	183	172	183	172	169	182	180	177.1	39	0.94	0.96
MT 9874	175	187	171	183	173	183	174	171	182	179	177.9	45	0.89	0.96

TABLE 1. HEADING DATE (JULIAN DAYS 175=JUNE 24) SUMMARY FOR THE ADVANCED SPRING WHEAT NURSERY GROWN ACROSS MONTANA, 1999

VARIETY OR ID	HAVRE DRY	MOCCASIN DRY	HUNTLEY DRY	CONRAD DRY	SIDNEY DRY	BOZEMAN DRY	SIDNEY IRR	HUNTLEY IRR	BOZEMAN IRR	KALISPELL HI-RAIN	AVG	RANK	BYX	RSQ
MT 9875	174	185	171	183	170	182	170	170	182	175	176.3	32	0.97	0.98
MTHW9420	174	185	168	183	168	182	168	167	181	172	174.8	10	1.14	0.98
MTHW9603	175	185	168	184	169	182	171	167	182	174	175.7	23	1.11	0.99
MTHW9701	175	183	169	182	169	181	171	168	181	174	175.3	19	0.95	0.98
Parshall	174	183	167	182	170	181	170	166	180	174	174.7	9	1.02	0.99
Reeder	175	184	167	182	169	182	169	167	181	174	175.0	12	1.07	0.99
AMIDON	174	185	170	183	171	182	172	169	181	177	176.4	33	0.94	0.99
GRANDIN	175	184	167	183	169	182	169	166	181	174	175.0	13	1.10	0.99
HI-LINE	174	182	167	181	168	180	169	166	179	172	173.9	6	0.99	1.00
MCNEAL	174	186	171	183	172	183	172	169	183	176	176.9	38	0.99	0.98
ERNEST	176	184	171	182	170	182	170	169	180	176	176.0	28	0.89	0.98
Scholar	175	186	171	185	173	184	172	171	182	177	177.5	41	0.96	0.98
SDM50005	175	187	171	183	173	186	172	170	183	178	177.9	44	1.01	0.97
WESTBRED926	174	181	165	181	166	181	167	165	179	171	173.0	4	1.10	0.97
SITEMEAN*	174.7	184.4	169.0	182.5	170.2	182.3	171.0	167.9	181.3	175.1	175.8		1.00	1.00
C.V.	0.48	0.49	0.49	1 REP	0.41	1 REP	0.37	0.16	1 REP	0.52				
LSD (.05)	1.35	1.50	1.33		1.16		1.06	0.43		1.52				

TABLE 2. PLANT HEIGHT (INCHES) SUMMARY FOR THE ADVANCED SPIRNG WHEAT NURSERY GROWN ACROSS MONTANA, 1999

VARIETY OR ID	HAVRE DRY	MOCCASIN DRY	HUNTLEY DRY	CONRAD DRY	SIDNEY DRY	BOZEMAN DRY	SIDNEY IRR	HUNTLEY IRR	BOZEMAN IRR	KALISPELL HI-RAIN	AVG	RANK	BYX	RSQ
BR 2306	33.1	32.2	33.4	34.0	30.8	34.3	37.5	38.3	39.1	39.6	35.2	23	1.20	0.96
Zeke	32.6	32.3	32.6	33.0	29.5	34.2	33.7	36.0	37.9	36.7	33.8	29	0.89	0.86
Pristine	28.9	31.6	32.0	33.0	30.1	33.1	34.5	32.1	37.5	38.0	33.1	32	0.95	0.70
Conan	30.5	30.2	28.4	33.0	28.8	31.6	35.3	33.8	34.7	35.6	32.2	43	0.96	0.87
BZ996472	30.6	31.1	30.7	29.0	29.1	32.4	33.0	35.6	35.3	33.9	32.1	44	0.82	0.79
THATCHER	39.2	40.0	39.7	40.0	40.0	41.9	42.7	45.9	46.7	45.9	42.2	1	1.10	0.91
FORTUNA	37.1	35.8	39.0	38.0	36.2	41.8	38.2	39.8	43.9	39.4	38.9	5	0.67	0.47
LEW	39.0	37.1	33.3	37.0	37.6	40.2	38.3	42.5	43.7	40.6	38.9	6	0.92	0.61
NEWANA	30.3	28.8	26.2	31.0	28.3	30.9	35.9	34.6	35.7	35.4	31.7	46	1.28	0.88
MT 9675	33.0	35.3	30.4	34.0	30.9	35.1	37.8	38.8	38.6	38.8	35.3	21	1.16	0.87
MT 9706	33.4	35.2	33.5	36.0	34.3	35.7	39.3	40.0	40.1	40.3	36.8	15	1.06	0.93
MT 9712	34.1	34.8	33.2	35.0	31.7	36.9	35.8	38.9	40.6	39.8	36.1	17	1.08	0.90
MT 9715	29.5	32.4	30.2	33.0	30.0	33.1	35.4	37.3	36.6	36.9	33.4	31	1.11	0.91
MT 9719	30.8	31.4	29.9	32.0	28.7	32.3	34.6	34.8	34.9	35.8	32.5	38	0.91	0.95
MT 9720	32.0	29.8	30.5	33.0	28.6	31.6	35.7	35.2	34.8	35.5	32.7	37	0.92	0.85
MT 9735	33.5	31.3	30.6	32.0	30.1	33.0	36.2	33.5	34.9	36.2	33.1	33	0.72	0.72
MT 9739	34.9	35.2	38.5	38.0	35.9	38.7	38.8	38.6	41.3	41.8	38.2	9	0.77	0.71
MT 9748	33.5	32.5	33.3	33.0	31.2	35.4	37.4	37.9	38.7	38.9	35.2	22	1.08	0.95
MT 9754	28.8	27.1	28.6	29.0	27.7	30.3	30.6	33.2	33.2	33.2	30.2	49	0.87	0.91
MT 9755	29.5	30.5	30.7	31.0	27.4	32.7	34.7	33.9	36.6	35.8	32.3	42	1.10	0.92
MT 9771	37.3	35.8	36.5	38.0	36.7	38.4	39.0	39.9	42.1	42.3	38.6	7	0.83	0.89
MT 9772	34.0	35.4	37.8	38.0	36.8	38.6	37.8	40.9	41.6	42.4	38.3	8	0.89	0.73
MT 9801	29.5	31.3	29.5	33.0	29.0	32.5	33.7	36.4	35.1	36.7	32.7	36	1.06	0.91
MT 9802	34.8	34.1	35.4	34.0	31.9	37.3	38.9	39.0	39.8	39.5	36.5	16	1.02	0.88
MT 9806	32.5	32.6	31.7	34.0	31.1	33.1	35.7	36.1	37.1	36.3	34.0	27	0.81	0.95
MT 9807	32.4	29.9	28.8	33.0	30.0	32.0	34.3	33.3	35.3	35.1	32.4	40	0.78	0.80
MT 9813	34.1	32.7	34.5	35.0	33.3	34.8	38.6	39.0	38.7	39.0	36.0	18	0.95	0.90
MT 9815	35.3	35.4	34.8	37.0	35.1	37.7	40.4	41.6	40.8	41.8	38.0	10	1.10	0.96
MT 9834	30.9	27.9	28.0	32.0	32.0	30.7	35.9	35.0	35.2	35.5	32.3	41	0.98	0.70
MT 9835	31.6	30.6	29.9	32.0	28.7	31.6	31.7	32.6	33.5	35.9	31.8	45	0.67	0.75
MT 9836	29.9	28.4	28.9	31.0	29.1	30.9	33.4	35.0	34.3	34.8	31.6	47	0.98	0.95
MT 9849	33.6	36.2	36.2	36.0	34.3	37.8	37.2	40.9	41.7	42.0	37.6	12	1.08	0.85
MT 9850	33.1	34.4	36.2	35.0	33.6	37.9	37.3	41.5	41.1	41.3	37.1	14	1.17	0.85
MT 9866	37.0	35.2	36.8	40.0	37.4	39.0	40.6	42.7	41.9	43.2	39.4	2	1.00	0.86
MT 9874	32.9	32.2	31.0	33.0	31.4	32.0	37.7	39.3	37.7	37.7	34.5	24	1.14	0.84

TABLE 2. PLANT HEIGHT (INCHES) SUMMARY FOR THE ADVANCED SPIRNG WHEAT NURSERY GROWN ACROSS MONTANA, 1999

VARIETY OR ID	HAVRE DRY	MOCCASIN DRY	HUNTLEY DRY	CONRAD DRY	SIDNEY DRY	BOZEMAN DRY	SIDNEY IRR	HUNTLEY IRR	BOZEMAN IRR	KALISPELL HI-RAIN	AVG	RANK	BYX	RSQ
MT 9875	30.5	32.2	30.9	33.0	29.5	33.5	37.0	37.4	37.7	37.5	33.9	28	1.24	0.96
MTHW9420	29.6	30.2	30.7	32.0	29.0	32.6	34.0	37.3	36.7	36.8	32.9	34	1.20	0.96
MTHW9603	31.6	31.9	32.2	33.0	30.4	35.7	37.2	36.8	37.9	36.9	34.4	25	1.05	0.92
MTHW9701	28.0	29.4	27.3	30.0	27.2	31.4	33.5	32.8	35.1	32.3	30.7	48	1.01	0.89
Parshall	36.2	37.1	35.8	39.0	34.7	39.7	40.2	40.8	43.4	43.4	39.0	4	1.16	0.95
Reeder	34.7	33.3	32.5	35.0	31.1	36.6	38.3	36.6	38.9	39.7	35.7	20	1.05	0.88
AMIDON	36.4	36.7	36.6	38.0	38.8	38.5	40.4	43.6	41.4	42.9	39.3	3	0.90	0.78
GRANDIN	32.3	35.1	33.7	35.0	30.5	37.5	37.6	38.6	39.7	38.5	35.8	19	1.10	0.86
HI-LINE	31.8	31.3	30.0	34.0	28.1	33.5	33.5	33.4	36.2	36.1	32.8	35	0.88	0.79
MCNEAL	29.5	32.9	30.9	33.0	29.6	33.6	37.9	37.3	38.7	38.7	34.2	26	1.38	0.93
ERNEST	36.4	35.1	34.5	38.0	33.5	38.2	38.1	39.8	42.4	41.9	37.8	11	1.12	0.92
Scholar	36.1	33.4	34.4	39.0	35.9	37.5	36.8	40.9	40.8	40.0	37.5	13	0.87	0.71
SDM50005	34.5	30.8	28.1	33.0	30.8	32.0	37.5	37.2	36.5	36.3	33.7	30	1.06	0.71
WESTBRED926	29.0	30.6	31.2	32.0	28.6	32.5	34.1	34.3	36.3	35.1	32.4	39	0.96	0.92
SITE MEAN	32.9	32.8	32.4	34.3	31.7	34.9	36.6	37.6	38.4	38.3	35.0		1.00	1.00
C.V.	5.8	4.0	3.5	1 REP	3.3	2.1	3.0	5.7	1.8	2.0				
LSD	3.1	2.2	1.9		1.8	1.2	1.9	3.5	1.2	1.3				

TABLE 3. GRAIN PROTEIN CONTENT(PECENT)) SUMMARY FOR THE ADVANCED SPRING WHEAT NURSERY GROWN ACROSS MONTANA, 1999

VARIETY OR ID	HAVRE DRY	MOCCASIN DRY	HUNTLEY DRY	CONRAD DRY	SIDNEY DRY	BOZEMAN DRY	SIDNEY IRR	HUNTLEY IRR	BOZEMAN IRR	KALISPELL HI-RAIN	AVG	RANK	BYX	RSQ
BR 2306	14.6	15.9	16.4	11.2	11.3	15.0	12.1	13.7	12.5	12.3	13.5	46	1.09	0.93
Zeke	15.7	14.8	17.3	11.9	11.9	14.9	12.7	15.0	13.8	13.1	14.1	39	0.97	0.87
Pristine	15.8	15.7	16.9	11.9	12.2	15.9	13.1	15.0	13.8	13.1	14.3	33	0.99	0.91
Conan	14.8	16.3	17.9	12.9	12.7	16.2	14.0	14.0	14.2	13.2	14.6	23	0.98	0.95
BZ996472	14.7	15.8	15.6	12.8	12.0	14.6	12.6	13.9	12.7	12.8	13.8	42	0.74	0.84
THATCHER	16.6	16.8	18.9	11.9	12.4	17.7	13.4	15.2	13.2	13.6	15.0	8	1.41	0.96
FORTUNA	14.5	15.4	16.7	13.2	12.6	15.8	14.7	14.9	14.2	13.0	14.5	26	0.72	0.87
LEW	16.0	15.4	18.4	12.9	12.1	16.3	14.8	14.9	13.3	13.4	14.8	15	1.08	0.92
NEWANA	15.1	15.8	17.2	12.0	11.9	16.3	12.4	13.2	12.1	12.1	13.8	43	1.19	0.94
MT 9675	15.0	15.1	16.7	10.6	11.3	15.0	12.0	13.1	11.2	12.3	13.2	49	1.19	0.92
MT 9706	14.4	15.8	18.2	13.6	12.8	16.2	14.2	15.7	14.1	13.9	14.9	12	0.89	0.89
MT 9712	14.5	16.3	18.8	13.2	12.4	16.5	14.3	15.0	13.7	14.0	14.9	13	1.08	0.93
MT 9715	14.8	15.2	17.1	12.7	11.3	16.3	13.1	13.8	12.8	13.0	14.0	41	1.05	0.96
MT 9719	14.6	15.5	17.5	12.3	12.1	16.1	13.5	14.3	13.8	13.9	14.4	30	0.97	0.96
MT 9720	14.9	15.7	18.2	12.2	12.0	16.2	13.7	14.2	13.9	13.6	14.5	27	1.10	0.97
MT 9735	14.3	15.4	16.9	11.2	11.2	15.2	12.4	13.1	12.0	12.6	13.4	47	1.13	0.97
MT 9739	14.7	15.4	16.9	12.9	13.3	16.5	14.1	15.0	13.9	14.2	14.7	18	0.74	0.92
MT 9748	15.3	15.7	18.3	12.6	11.7	16.0	12.9	14.3	13.4	12.6	14.3	34	1.20	0.98
MT 9754	16.2	15.7	18.9	12.0	12.3	15.9	14.6	14.1	12.5	13.2	14.5	28	1.23	0.90
MT 9755	14.6	16.7	18.9	12.1	12.0	16.3	13.0	14.0	13.2	11.9	14.3	35	1.37	0.96
MT 9771	14.8	15.4	17.4	13.8	12.9	16.8	14.4	15.6	14.9	14.2	15.0	9	0.75	0.87
MT 9772	14.6	15.5	17.3	13.6	14.2	16.5	14.8	15.9	14.3	14.4	15.1	6	0.62	0.81
MT 9801	15.3	15.8	18.4	13.9	12.1	16.6	13.6	14.1	12.6	13.1	14.5	29	1.11	0.91
MT 9802	15.1	15.6	17.9	13.4	13.2	16.8	13.5	16.4	14.3	14.3	15.1	7	0.88	0.86
MT 9806	16.1	16.2	18.4	14.6	13.4	16.9	14.4	14.5	15.5	13.5	15.3	2	0.87	0.86
MT 9807	16.2	16.6	18.5	12.7	13.5	17.6	14.3	14.0	15.4	13.5	15.2	5	1.09	0.89
MT 9813	16.2	16.4	18.9	13.7	13.5	16.6	14.0	14.4	14.9	14.6	15.3	3	0.97	0.93
MT 9815	15.9	15.2	17.4	12.8	13.8	16.2	14.0	15.2	15.0	14.5	15.0	10	0.73	0.87
MT 9834	14.7	15.5	17.8	13.4	12.8	15.8	12.8	13.0	13.5	12.5	14.2	37	0.96	0.87
MT 9835	15.1	15.1	16.8	12.2	12.7	16.2	14.0	14.0	12.8	12.9	14.2	38	0.91	0.94
MT 9836	15.3	15.2	16.8	12.9	12.2	15.5	13.6	13.6	13.4	12.7	14.1	40	0.86	0.95
MT 9849	15.0	15.1	17.2	12.0	12.8	16.3	13.3	14.3	14.2	13.5	14.4	31	0.92	0.94
MT 9850	15.9	15.5	18.4	13.2	14.0	17.0	14.2	15.8	14.5	14.7	15.3	4	0.88	0.92
MT 9866	14.1	15.2	17.8	13.3	13.3	16.1	13.9	14.4	14.0	13.6	14.6	24	0.81	0.91
MT 9874	14.9	15.4	17.8	12.7	12.9	15.8	13.6	14.5	13.8	12.9	14.4	32	0.94	0.97

TABLE 3. GRAIN PROTEIN CONTENT(PECENT)) SUMMARY FOR THE ADVANCED SPRING WHEAT NURSERY GROWN ACROSS MONTANA, 1999

VARIETY OR ID	HAVRE DRY	MOCCASIN DRY	HUNTLEY DRY	CONRAD DRY	SIDNEY DRY	BOZEMAN DRY	SIDNEY IRR	HUNTLEY IRR	BOZEMAN IRR	KALISPELL HI-RAIN	AVG	RANK	BYX	RSQ
MT 9875	14.4	15.5	17.1	11.5	12.5	16.0	13.6	14.3	13.7	14.0	14.3	36	0.93	0.91
MTHW9420	14.5	15.6	17.3	11.5	10.9	16.0	12.8	13.7	12.3	11.8	13.6	44	1.27	0.98
MTHW9603	14.4	14.7	17.1	12.8	11.1	15.4	12.3	13.0	11.5	11.6	13.4	48	1.10	0.90
MTHW9701	14.0	15.3	17.8	12.7	11.4	15.0	12.9	12.7	12.5	11.8	13.6	45	1.10	0.90
Parshall	15.2	15.3	17.8	14.0	13.6	17.0	14.0	14.9	14.3	14.0	15.0	11	0.80	0.93
Reeder	16.5	15.2	17.2	12.9	12.0	16.5	13.8	14.8	13.8	13.8	14.7	19	0.95	0.89
AMIDON	14.0	15.2	17.9	13.0	13.5	16.4	13.9	14.8	14.5	13.7	14.7	20	0.82	0.86
GRANDIN	14.7	15.8	17.3	12.8	12.7	16.4	13.6	14.9	15.1	14.7	14.8	16	0.81	0.85
HI-LINE	16.0	16.3	17.8	12.5	13.0	15.8	13.8	14.1	13.9	12.7	14.6	25	1.02	0.93
MCNEAL	15.9	16.1	18.1	12.4	12.2	16.2	13.5	15.1	14.0	13.5	14.7	21	1.11	0.97
ERNEST	16.3	16.1	18.6	12.7	14.3	17.1	14.3	15.3	15.4	13.7	15.4	1	0.98	0.90
Scholar	15.5	15.5	19.1	12.9	12.8	17.0	13.6	14.9	13.9	14.0	14.9	14	1.15	0.97
SDM50005	16.3	16.8	19.2	12.2	12.2	16.7	13.2	14.2	12.7	13.0	14.7	22	1.42	0.97
WESTBRED926	15.8	16.4	18.2	13.3	12.2	16.4	14.2	14.6	13.3	13.4	14.8	17	1.09	0.96
SITE MEAN	15.2	15.7	17.7	12.7	12.5	16.2	13.6	14.4	13.6	13.3	14.5		1.00	1.00

TABLE 4. TEST WEIGHT (LB/BU) SUMMARY FOR THE ADVANCED SPRING WHEAT NURSERY GROWN ACROSS MONTANA, 1999.

VARIETY OR ID	HAVRE DRY	MOCCASIN DRY	HUNTLEY DRY	CONRAD DRY	SIDNEY DRY	BOZEMAN DRY	SIDNEY IRR	HUNTLEY IRR	BOZEMAN IRR	KALISPELL HI-RAIN	AVG	RANK	BYX	RSQ
BR 2306	55.9	55.6	54.3	61.8	60.8	59.9	57.8	63.9	62.4	61.8	59.4	37	1.09	0.85
Zeke	56.8	57.6	55.3	58.4	61.2	59.7	60.8	61.0	61.9	61.5	59.4	36	0.76	0.89
Pristine	59.9	60.1	57.9	63.1	62.0	61.0	60.7	64.3	64.0	63.7	61.7	4	0.70	0.88
Conan	58.2	59.0	55.0	61.7	62.3	60.2	60.9	62.3	62.1	61.3	60.3	19	0.81	0.94
BZ996472	60.5	60.9	58.7	63.2	64.0	62.9	63.3	64.7	64.4	63.7	62.6	1	0.69	0.98
THATCHER	53.8	55.3	51.4	59.6	59.7	55.6	57.3	61.9	62.2	61.7	57.8	48	1.30	0.94
FORTUNA	57.9	57.9	57.6	61.6	62.0	61.9	59.6	64.0	63.5	62.7	60.9	12	0.78	0.81
LEW	57.0	58.8	53.0	58.6	62.2	60.8	60.3	63.2	64.3	62.9	60.1	22	1.13	0.87
NEWANA	55.0	57.5	53.9	62.2	61.2	58.5	60.1	63.6	62.1	61.8	59.6	32	1.13	0.94
MT 9675	54.5	56.3	52.8	59.5	59.5	59.4	58.1	62.2	61.9	60.7	58.5	44	1.07	0.93
MT 9706	57.7	58.3	56.3	61.7	61.5	60.8	60.8	63.4	62.9	62.5	60.6	13	0.84	0.97
MT 9712	57.7	59.3	56.4	62.4	63.2	60.9	62.6	63.5	63.4	63.4	61.3	7	0.92	0.98
MT 9715	56.0	56.1	54.6	59.9	60.5	56.8	56.7	63.5	63.3	61.9	58.9	43	1.05	0.80
MT 9719	59.2	60.0	57.6	63.0	63.3	62.1	62.5	63.9	63.7	64.0	61.9	2	0.79	0.98
MT 9720	58.9	58.8	56.7	63.1	63.0	61.0	61.8	64.7	63.9	63.4	61.5	5	0.93	0.98
MT 9735	57.7	57.8	51.0	62.9	60.5	60.6	59.9	61.7	62.7	61.8	59.7	30	1.15	0.83
MT 9739	57.3	58.1	53.0	61.2	62.5	60.9	63.0	61.1	62.9	62.6	60.3	20	1.07	0.87
MT 9748	56.9	56.2	53.1	60.9	61.5	59.4	59.8	64.6	63.4	63.1	59.9	23	1.26	0.95
MT 9754	53.9	56.8	50.8	61.4	61.0	57.1	56.9	61.9	62.3	59.2	58.1	47	1.25	0.87
MT 9755	55.7	55.0	53.4	60.7	61.2	58.4	59.7	61.4	62.9	61.0	58.9	42	1.12	0.96
MT 9771	55.9	56.3	55.5	60.2	62.0	57.5	62.7	59.8	62.7	62.5	59.5	34	0.94	0.78
MT 9772	56.6	56.8	57.8	60.5	62.5	59.2	62.4	63.4	63.3	62.8	60.5	16	0.89	0.83
MT 9801	54.2	54.6	50.7	60.0	61.2	55.6	60.7	62.4	62.6	61.6	58.4	45	1.47	0.97
MT 9802	55.9	57.5	54.0	60.1	60.8	58.5	62.7	60.6	62.6	61.6	59.4	39	0.98	0.89
MT 9806	57.5	58.2	52.8	61.3	61.7	60.8	61.4	59.2	62.7	62.6	59.8	27	0.96	0.78
MT 9807	56.9	58.4	53.7	62.0	61.8	58.0	61.4	60.6	62.3	62.1	59.7	28	0.97	0.88
MT 9813	56.7	57.4	55.4	61.6	62.3	60.4	62.6	63.3	63.0	62.9	60.6	14	1.04	0.97
MT 9815	58.7	60.6	58.1	62.6	62.7	62.8	63.2	63.8	62.8	63.1	61.8	3	0.66	0.86
MT 9834	54.0	56.5	50.7	60.0	61.0	56.8	60.7	61.5	62.0	60.5	58.4	46	1.31	0.96
MT 9835	57.8	58.2	55.3	62.1	63.3	58.0	61.2	62.3	64.1	62.2	60.4	18	1.00	0.92
MT 9836	57.5	58.2	56.0	62.3	63.2	60.1	61.4	64.8	63.6	62.2	60.9	11	1.01	0.96
MT 9849	57.4	58.4	56.8	61.8	61.8	60.3	61.8	62.5	62.3	62.2	60.5	17	0.76	0.96
MT 9850	58.2	59.9	56.5	61.2	61.8	60.6	61.3	62.1	62.4	62.0	60.6	15	0.67	0.95
MT 9866	57.0	57.2	55.6	60.3	61.3	59.8	61.0	60.3	62.2	62.5	59.7	31	0.79	0.90
MT 9874	56.6	54.9	53.3	61.3	60.8	58.7	60.5	62.4	61.4	61.5	59.1	40	1.09	0.94

TABLE 4. TEST WEIGHT (LB/BU) SUMMARY FOR THE ADVANCED SPRING WHEAT NURSERY GROWN ACROSS MONTANA, 1999.

VARIETY OR ID	HAVRE DRY	MOCCASIN DRY	HUNTLEY DRY	CONRAD DRY	SIDNEY DRY	BOZEMAN DRY	SIDNEY IRR	HUNTLEY IRR	BOZEMAN IRR	KALISPELL HI-RAIN	AVG	RANK	BYX	RSQ
MT 9875	58.9	57.3	54.8	60.5	62.2	59.1	60.4	63.8	62.5	62.0	60.1	21	0.93	0.92
MTHW9420	54.5	56.7	52.8	60.3	61.2	56.1	59.4	63.4	63.5	61.0	58.9	41	1.28	0.93
MTHW9603	53.0	53.0	51.5	58.1	60.3	55.4	58.9	61.1	61.3	59.8	57.2	49	1.29	0.95
MTHW9701	56.6	57.2	53.0	58.3	61.5	59.8	60.3	63.3	62.7	60.9	59.4	38	1.07	0.90
Parshall	59.0	59.3	55.4	60.9	63.3	59.9	64.1	63.6	63.5	63.5	61.2	8	0.96	0.89
Reeder	58.6	59.9	56.7	61.9	62.3	61.0	62.9	63.3	62.9	63.0	61.3	6	0.78	0.96
AMIDON	57.0	58.0	56.8	59.3	61.5	58.7	61.8	61.4	62.4	62.2	59.9	26	0.73	0.86
GRANDIN	56.8	58.9	53.2	61.1	61.8	58.8	61.8	60.1	63.2	62.9	59.9	24	1.02	0.86
HI-LINE	57.1	56.1	51.7	60.2	61.8	59.6	59.9	64.0	63.2	62.3	59.6	33	1.30	0.95
MCNEAL	56.6	55.1	53.9	61.1	60.8	60.4	61.2	63.9	62.2	62.0	59.7	29	1.13	0.91
ERNEST	57.4	58.8	56.1	62.1	62.7	59.5	62.5	63.5	63.5	63.5	61.0	10	0.98	0.98
Scholar	58.1	59.9	57.8	61.5	61.8	60.6	61.3	63.3	63.4	63.1	61.1	9	0.70	0.94
SDM50005	56.0	57.1	52.1	61.8	62.2	58.3	61.6	64.0	63.7	62.0	59.9	25	1.36	0.98
WESTBRED926	56.6	56.6	53.8	60.4	61.7	58.1	60.2	63.4	62.6	61.4	59.5	35	1.09	0.98
SITE MEAN	56.9	57.6	54.6	61.1	61.8	59.4	60.9	62.7	62.9	62.2	60.0		1.00	1.00
C.V.	0.67	1.09	3.4	1 REP	0.89	1 REP	1.33	2.56	1 REP	0.78				
LSD	0.65	1.07	3.02		0.89		1.34	2.66		0.82				

TABLE 5. YIELD (BU/AC) SUMMARY FOR THE ADVANCED SPRING WHEAT NURSERY GROWN ACROSS MONTANA, 1999

VARIETY OR ID	HAVRE DRY	MOCCASIN DRY	HUNTLEY DRY	CONRAD DRY	SIDNEY DRY	BOZEMAN DRY	SIDNEY IRR	HUNTLEY IRR	BOZEMAN IRR	KALISPELL HI-RAIN	AVG	RANK	BYX	RSQ
BR 2306	46.2	47.2	46.8	61.1	56.5	71.5	78.8	127.0	115.0	130.4	78.0	1	0.98	1.13
Zeke	49.0	49.2	44.2	57.2	58.7	70.4	86.6	137.7	102.9	121.8	77.8	2	0.98	1.11
Pristine	43.2	46.0	43.2	60.8	49.8	65.2	73.6	104.7	105.7	129.1	72.1	21	0.93	1.00
Conan	47.8	37.4	38.7	55.2	51.7	62.5	81.0	95.5	91.8	99.6	66.1	45	0.96	0.79
BZ996472	44.7	47.9	39.1	61.1	52.8	70.7	82.3	115.9	99.3	97.0	71.1	28	0.97	0.88
THATCHER	32.5	38.9	31.1	53.4	46.2	54.0	54.8	98.3	83.6	103.5	59.6	49	0.95	0.87
FORTUNA	35.9	42.8	38.5	57.7	49.1	64.8	62.4	92.7	91.7	96.6	63.2	47	0.95	0.76
LEW	37.2	41.6	33.1	45.9	46.1	60.8	54.2	91.1	95.8	99.0	60.5	48	0.92	0.82
NEWANA	45.9	42.4	36.4	64.4	55.7	64.0	79.0	122.7	108.4	122.3	74.1	10	0.99	1.10
MT 9675	42.2	47.8	40.4	59.3	58.9	69.3	82.0	130.5	108.2	124.9	76.3	4	1.00	1.14
MT 9706	44.4	49.5	42.3	58.3	50.4	63.8	86.7	118.0	97.0	119.8	73.0	14	0.99	1.01
MT 9712	44.8	47.4	37.3	56.7	61.9	70.7	92.3	129.7	99.5	112.0	75.2	6	0.98	1.05
MT 9715	39.0	49.4	42.9	56.3	52.5	70.1	67.7	112.9	107.9	116.3	71.5	27	0.96	0.99
MT 9719	45.7	49.9	41.5	54.1	47.3	64.8	71.9	110.4	97.2	108.9	69.2	41	0.98	0.90
MT 9720	45.9	44.4	38.1	61.1	47.6	64.8	66.0	120.3	101.2	111.9	70.1	35	0.97	1.00
MT 9735	44.0	45.8	38.0	64.9	42.6	61.2	70.3	107.6	109.2	109.8	69.3	40	0.94	0.96
MT 9739	44.6	46.6	41.8	54.3	61.3	63.7	92.5	106.0	87.3	105.8	70.4	32	0.94	0.83
MT 9748	46.4	45.3	42.8	56.2	47.1	62.9	73.0	129.7	109.2	115.7	72.8	16	0.97	1.10
MT 9754	43.4	45.8	33.6	54.6	51.4	62.4	75.2	123.2	106.8	109.8	70.6	30	0.99	1.07
MT 9755	48.1	45.6	39.8	61.7	49.9	63.6	81.3	120.5	107.8	116.5	73.5	12	0.98	1.04
MT 9771	40.2	43.5	37.0	51.9	59.3	59.6	90.5	122.2	100.8	111.6	71.7	25	0.98	1.06
MT 9772	43.7	43.9	38.0	55.1	58.2	61.9	84.9	126.0	96.0	109.6	71.7	24	0.99	1.03
MT 9801	44.7	45.2	38.2	53.9	56.8	63.0	84.7	134.5	108.1	119.2	74.8	7	1.00	1.17
MT 9802	37.1	43.7	43.3	47.0	53.2	64.8	86.7	110.5	91.4	113.3	69.1	42	0.96	0.96
MT 9806	46.3	44.6	38.4	53.9	59.7	67.5	83.4	121.0	91.0	122.9	72.9	15	0.98	1.03
MT 9807	47.6	39.0	40.3	55.8	59.3	63.2	86.6	110.1	88.9	110.6	70.1	36	0.97	0.90
MT 9813	40.1	43.4	39.5	51.4	54.2	63.5	84.6	102.1	84.4	103.2	66.6	44	0.97	0.83
MT 9815	38.4	45.5	40.0	50.4	51.8	60.0	70.8	108.6	82.9	103.4	65.2	46	0.99	0.86
MT 9834	40.9	43.6	32.6	57.1	53.8	65.2	73.5	134.7	105.9	111.1	71.8	22	0.98	1.15
MT 9835	43.9	43.6	38.2	56.7	52.7	61.0	80.7	99.1	98.3	109.8	68.4	43	0.97	0.88
MT 9836	43.1	38.1	37.7	56.6	55.7	60.9	84.4	118.2	98.9	110.2	70.4	33	0.99	1.02
MT 9849	43.5	47.6	38.4	57.6	55.3	69.5	83.9	120.1	101.2	117.0	73.4	13	1.00	1.03
MT 9850	44.9	50.0	39.7	52.5	56.5	65.5	79.6	113.1	95.7	108.8	70.6	31	0.99	0.91
MT 9866	40.4	42.5	36.5	51.4	60.6	64.4	78.2	121.6	97.8	108.9	70.2	34	0.99	1.02
MT 9874	44.1	46.0	40.0	54.8	59.8	69.4	85.4	125.1	106.0	113.3	74.4	9	0.99	1.05

TABLE 5. YIELD (BU/AC) SUMMARY FOR THE ADVANCED SPRING WHEAT NURSERY GROWN ACROSS MONTANA, 1999

VARIETY OR ID	HAVRE DRY	MOCCASIN DRY	HUNTLEY DRY	CONRAD DRY	SIDNEY DRY	BOZEMAN DRY	SIDNEY IRR	HUNTLEY IRR	BOZEMAN IRR	KALISPELL HI-RAIN	AVG	RANK	BYX	RSQ
MT 9875	42.1	43.9	40.0	53.9	58.1	66.1	84.3	126.4	104.7	102.8	72.2	17	0.97	1.02
MTHW9420	35.6	45.2	36.1	55.0	55.9	70.2	75.3	126.8	115.9	130.3	74.6	8	0.98	1.23
MTHW9603	28.0	39.4	34.7	49.9	58.6	71.7	84.4	120.4	113.0	116.6	71.7	26	0.97	1.18
MTHW9701	43.5	46.0	33.1	52.5	57.8	66.0	82.2	120.7	115.0	104.4	72.1	19	0.96	1.05
Parshall	42.4	44.7	37.7	51.2	57.0	63.0	92.2	121.9	84.8	101.5	69.6	39	0.94	0.94
Reeder	49.1	48.7	45.5	61.5	65.3	72.7	95.5	123.9	94.0	111.1	76.7	3	0.96	0.92
AMIDON	40.4	44.1	34.6	50.9	61.0	65.1	85.9	132.3	95.7	110.7	72.1	20	0.97	1.09
GRANDIN	41.9	42.0	43.7	52.8	57.2	64.3	88.7	118.2	94.3	113.6	71.7	23	0.98	0.99
HI-LINE	45.3	46.5	37.5	59.3	48.6	66.0	71.4	117.1	100.4	113.7	70.6	29	0.98	0.99
MCNEAL	49.2	48.9	40.8	61.7	54.4	63.0	87.9	130.1	103.8	119.8	76.0	5	0.99	1.08
ERNEST	39.9	41.8	34.1	55.3	54.4	63.9	90.4	118.7	90.8	108.2	69.8	38	0.98	1.01
Scholar	42.2	46.2	36.4	51.5	59.5	65.8	71.1	112.5	95.5	117.1	69.8	37	0.97	0.97
SDM50005	46.1	40.5	31.6	63.4	57.2	63.7	88.2	124.4	107.0	113.9	73.6	11	0.98	1.10
WESTBRED926	41.9	44.5	39.9	59.8	54.1	69.8	81.4	119.7	104.4	106.3	72.2	18	0.99	0.99
SITE MEAN	42.8	44.8	38.6	55.9	54.8	65.1	80.2	117.9	99.8	112.1	71.2		1.00	1.00
C.V.	4.27	7.73	7.07	7.6	7.45	5.16	7.74	9.29	3.26	5.68				
LSD	3.1	5.9	4.7	7.3	6.8	5.8	10.4	17.8	5.6	10.8				