

**PROJECT TITLE:** Statewide Spring Wheat Variety Performance - 1996

**PROJECT LEADER:**

L. Talbert, Spring Wheat breeder, Bozeman

**PROJECT PERSONNEL:**

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

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

**RESULTS:** The 1996 Advanced Spring Wheat yield trial was grown at two irrigated and seven rainfed sites across Montana. Irrigated sites were at Sidney and Bozeman. Replicated multiple-row plots were established at all locations using standard research techniques.

Yield, test weight, heading date, plant height at maturity, and grain protein contents are summarized in Tables 1,2, 3, 4, and 5. Soft white wheats Penewawa and Vanna yielded most on a statewide basis, followed by Western Plant Breeders line BZ987331 and Amidon.

Average conditions at Havre resulted in typical yields. Good soil moisture at planting and timely rainfall in June at Sidney resulted in normal yields under dryland and irrigated conditions. Moccasin and Huntley experienced good rainfall until the beginning of June, when conditions became very dry. Moccasin had more moisture stress because of shallower soils. Abundant soil moisture and timely rainfall in the spring resulted in high yields at Conrad. Bozeman and Kalispell had good soil moisture at planting and timely rain in the spring, but hot dry weather in June and July resulted in lower than normal yields.

**SUMMARY:**

The highest yielding varieties on a statewide basis were soft white wheat Penewawa and Vanna. Highest yielding hard red wheats on a statewide basis were Amidon and Montana line MT9502.

**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.

1996 GRAIN YIELD (BU/AC) SUMMARY FOR THE ADVANCED SPRING WHEAT NURSERY GROWN ACROSS MONTANA

ID	PEDIGREE	HAVRE	SIDNEY DRY	SIDNEY IRR	MOCCASIN	HUNTLEY DRY	CONRAD DRY	KALISPELL	BOZEMAN DRY	BOZEMAN IRR	AVG	BYX	RSQ
BZ684-23	YANNA	34.04	42.08	103.98	29.67	39.47	67.12	72.33	48.52	116.74	61.4	1.15	0.98
BZ987331	MSFRS SELECTION	35.81	40.19	97.00	29.33	33.20	68.67	79.40	46.26	110.69	69.9	1.13	1.00
BZ992688	FAMBO/906R	36.23	41.09	78.82	23.47	31.97	64.94	69.27	43.44	90.62	53.3	0.87	0.99
BZ992632	FORTUNA/906R	35.61	41.51	93.06	27.50	29.63	76.77	71.73	47.06	94.78	67.4	0.99	0.97
CI 10003	THATCHER	30.44	34.28	77.44	19.40	24.77	67.48	62.83	38.71	86.94	48.0	0.90	0.99
CI 13696	FORTUNA	33.30	38.93	80.88	24.87	25.87	57.57	71.47	44.20	91.10	52.0	0.91	0.98
CI 17429	LEW	33.63	39.63	76.74	22.03	26.00	67.22	62.87	44.01	94.22	50.7	0.90	0.99
CI 17430	NEWANA	37.79	39.48	86.63	24.20	33.70	64.60	64.80	43.16	103.99	55.4	1.00	0.99
CI 17790	LEN	32.80	40.14	80.35	21.87	32.73	62.40	69.20	47.69	101.09	54.3	0.97	0.99
MT 9311	MT7819/(OLAF/LEW)	31.19	40.24	82.82	24.53	31.40	61.58	85.10	46.30	110.33	56.9	1.10	0.96
MT 9332	MT7810/MT7926	35.15	39.97	84.39	21.77	25.77	63.17	76.10	41.40	103.86	54.6	1.07	0.99
MT 9407	MT8808/MARBERG	35.67	34.83	86.40	25.07	24.43	69.76	69.33	46.57	94.43	52.8	0.97	0.99
MT 9410	MT8808/MARBERG	31.91	36.10	87.03	22.37	31.27	61.50	67.73	47.82	104.69	54.5	1.05	0.98
MT 9420	MT8808/MARBERG	31.61	32.73	91.62	21.67	33.40	68.79	73.23	42.18	99.56	63.8	1.05	0.99
MT 9427	MT8808/MARBERG	31.50	36.42	85.10	25.00	33.10	69.47	70.23	42.82	100.95	63.8	1.00	0.99
MT 9430	MT8808/MARBERG	33.56	38.89	82.11	22.30	23.73	69.04	80.37	44.57	90.91	52.8	0.96	0.95
MT 9433	MT8808/MARBERG	38.96	41.34	92.30	27.00	31.47	69.54	66.07	47.16	106.38	56.6	1.02	0.98
MT 9453	GLENMAN/AMIDON	34.36	39.95	82.34	25.10	31.93	60.07	79.27	45.57	101.19	55.5	0.99	0.98
MT 9502	FTA/MBG/MBG	35.11	39.35	99.66	26.43	30.17	68.44	64.07	49.35	114.80	58.6	1.16	0.98
MT 9503	FORTUNA/NEWANA/NEWANA	35.54	40.20	85.53	28.50	27.80	63.00	78.73	47.58	99.44	56.3	0.99	0.98
MT 9504	FORTUNA/NEWANA/NEWANA	39.76	38.84	89.97	23.60	19.83	71.24	80.93	48.04	106.06	57.6	1.13	0.97
MT 9507	PONDERA/FORTUNA/PONDERA	35.05	40.74	86.17	25.70	33.30	61.28	60.47	43.62	99.81	52.9	0.86	0.98
MT 9508	FORTUNA/PONDERA/PONDERA	37.19	43.19	90.68	28.97	33.73	61.59	60.63	42.88	94.29	54.8	0.89	0.97
MT 9513	FORTUNA/PONDERA/PONDERA	38.08	41.13	90.55	25.70	35.70	65.91	59.83	44.94	101.19	55.9	0.96	0.98
MT 9516	FORTUNA/PONDERA/PONDERA	35.06	37.70	86.81	23.73	29.90	65.72	64.10	42.58	92.91	52.1	0.92	0.97
MT 9517	FORTUNA/PONDERA/PONDERA	34.11	36.15	74.75	26.67	35.13	65.12	63.03	46.64	94.04	52.8	0.84	0.97
MT 9524	LEW/PONDERA/PONDERA	33.90	36.99	83.68	25.63	33.33	63.30	71.30	42.58	97.54	54.2	0.96	1.00
MT 9532	LEW/PONDERA/PONDERA	31.97	36.52	86.82	24.17	30.80	60.26	74.07	41.29	88.63	52.7	0.94	0.98
MT 9533	LEW/PONDERA/PONDERA	33.87	36.60	87.08	24.53	34.63	63.57	64.90	42.88	99.41	54.2	0.98	1.00
MT 9539	LEW/PONDERA/PONDERA	36.74	39.12	86.95	24.60	36.47	62.29	62.00	45.43	101.98	55.1	0.96	0.99
MT 9541	LEW/PONDERA/PONDERA	35.47	38.28	80.36	23.57	34.87	63.00	62.07	42.59	97.29	53.1	0.91	0.99
MT 9542	NORANA/FORTUNA/NORANA	36.26	43.42	92.04	29.57	27.77	68.12	70.03	50.10	100.08	57.6	0.99	0.99
MT 9553	PONDERA/FORTUNA/PONDERA	39.31	40.01	77.56	24.67	30.30	63.30	73.37	49.02	98.24	65.1	0.91	0.97
MT 9554	PONDERA/FORTUNA/PONDERA	36.46	38.99	84.21	27.37	30.13	65.29	61.60	41.83	92.12	53.1	0.89	0.99
MT 9558	PONDERA/LEW/PONDERA	36.30	41.34	87.06	22.97	29.30	67.27	60.00	45.20	101.66	64.7	0.99	0.99
MT 9559	HI-LINE/PI372129//2*HI-LI	38.15	39.16	93.93	22.57	38.37	72.46	65.50	48.18	107.61	58.4	1.06	0.98
MT 9565	HI-LINE/PI372129//HI-LINE	36.21	39.76	90.98	23.77	33.47	65.26	76.30	45.40	110.12	57.8	1.10	0.99
MTRWA116	PI372129//2*PONDERA	32.89	31.69	90.27	24.13	33.70	55.86	66.03	41.17	86.51	51.4	0.91	0.96
ND 606	AMIDON	35.62	39.65	93.45	28.13	34.70	65.94	84.80	48.08	107.91	59.8	1.09	0.98
ND 673	TRENTON	35.49	39.71	88.84	23.30	28.53	61.74	74.23	46.79	103.04	55.7	1.05	1.00
ND 677	ERNEST	36.44	37.86	92.62	28.57	27.63	63.71	69.40	46.28	100.23	56.7	1.02	0.99
PI483236	GLENMAN	39.63	42.00	88.44	23.37	31.73	64.96	65.97	46.73	98.76	55.7	0.96	0.99
PI649276	HI-LINE	36.83	42.46	94.40	21.80	34.50	62.40	64.60	46.89	101.79	56.2	1.02	0.99
PI674642	MONEAL	36.23	42.80	95.36	25.40	31.63	67.19	65.33	47.46	106.30	67.5	1.06	0.99
TR983239	FERGUS	34.36	38.93	100.34	21.27	37.37	60.51	78.97	44.27	88.49	56.1	1.00	0.93
WA 6920	PENAWAWA	35.85	45.19	106.66	30.63	27.63	73.69	83.20	47.01	110.30	62.2	1.20	0.98
WB 926	WESTBRED 926	34.61	38.35	92.90	23.37	33.83	68.84	84.77	44.97	92.10	57.1	1.01	0.96
WB 936	WESTBRED 936	34.63	41.27	92.69	23.80	26.70	68.71	60.40	47.41	104.70	55.5	1.07	0.98
WBEXPRES	WESTBRED EXPRESS	34.44	39.42	93.25	26.33	23.47	70.32	74.63	47.76	109.03	57.6	1.14	0.99
*****	SITE MEAN	35.18	39.28	88.43	24.89	31.01	64.06	69.89	46.31	99.96	55.3	1.00	1.00

Table 2.

1996 TEST WEIGHT (LB/BU) SUMMARY FOR THE ADVANCED SPRING WHEAT NURSERY GROWN ACROSS MONTANA

ID	PEDIGREE	HAVRE	SIDNEY DRY	SIDNEY IRR	MOCCASIN	HUNTLEY DRY	CONRAD DRY	KALISPELL	BOZEMAN DRY	BOZEMAN IRR	AVG	BYX	RSQ
BZ68423	YANNA	56.27	58.36	61.19	54.47	58.67	60.20	57.40	59.40	59.80	58.2	1.41	0.69
BZ987331	MSFRS SELECTION	60.20	59.97	62.51	58.20	59.13	61.20	60.20	60.20	60.20	60.2	0.90	0.86
BZ992588	RAMBO/906R	62.00	61.81	61.67	59.47	59.67	62.00	61.40	62.10	58.20	60.9	0.65	0.31
BZ992632	FORTUNA/906R	61.09	60.50	62.83	58.47	59.40	62.70	60.10	61.60	61.60	60.9	1.03	0.76
CI 10003	THATCHER	58.38	58.72	61.49	55.00	58.07	59.00	59.70	59.10	58.80	58.7	1.32	0.91
CI 13586	FORTUNA	61.79	61.35	63.05	59.60	59.80	62.40	62.00	62.50	62.10	61.6	0.84	0.75
CI 17429	LEW	60.96	61.85	62.88	57.73	60.53	61.40	62.90	61.60	62.20	61.3	1.13	0.78
CI 17430	NEWANA	60.50	61.91	61.54	55.73	59.87	60.50	60.50	59.70	60.50	60.2	1.08	0.80
CI 17790	LEN	59.82	61.13	61.53	56.27	60.13	60.90	60.60	61.40	60.80	60.3	1.21	0.86
MT 9311	MT7819/(OLAF/LEW)	59.50	62.39	61.63	60.60	61.93	60.40	62.50	62.00	60.40	61.3	0.20	0.05
MT 9332	MT7810/MT7926	60.26	62.17	62.68	59.47	60.53	60.20	61.50	61.90	60.80	61.1	0.67	0.60
MT 9407	MT8808/MARBERG	61.03	60.70	62.30	56.20	59.00	60.10	60.70	60.80	60.60	60.2	1.34	0.91
MT 9410	MT8808/MARBERG	61.31	62.34	63.53	59.20	61.27	61.70	61.10	62.00	60.30	61.2	0.90	0.81
MT 9420	MT8808/MARBERG	59.83	60.21	62.63	57.53	59.73	60.50	60.60	60.70	59.20	60.1	1.03	0.86
MT 9427	MT8808/MARBERG	59.82	59.62	61.83	58.33	59.87	61.00	60.60	60.60	60.30	60.2	0.71	0.79
MT 9430	MT8808/MARBERG	61.39	61.48	63.05	57.73	59.67	61.30	61.20	61.50	59.70	60.8	1.18	0.90
MT 9433	MT8808/MARBERG	62.07	62.40	61.99	59.07	60.67	61.40	61.50	60.90	58.80	61.0	0.68	0.42
MT 9453	GLENMAN/AMIDON	61.47	61.34	61.47	59.07	60.27	61.20	60.70	60.80	58.80	60.6	0.66	0.47
MT 9502	FTA/MBG/MBG	58.64	59.12	61.83	56.47	58.60	60.70	59.50	60.50	60.10	59.5	1.17	0.86
MT 9503	FORTUNA/NEWANA/NEWAN	59.47	61.05	60.80	58.00	59.00	58.40	60.70	58.90	60.10	59.6	0.66	0.38
MT 9504	FORTUNA/NEWANA/NEWAN	59.36	61.26	61.80	57.20	58.93	58.90	60.40	58.60	60.70	59.6	0.89	0.62
MT 9507	PONDERA/FORTUNA/PONDE	62.97	63.20	62.90	59.73	60.87	62.40	60.70	62.10	61.30	61.8	0.79	0.65
MT 9508	FORTUNA/PONDERA/PONDE	62.25	62.02	63.15	59.00	60.40	61.40	60.70	61.60	61.40	61.3	0.90	0.86
MT 9513	FORTUNA/PONDERA/PONDE	62.04	62.58	62.43	58.67	60.80	61.20	60.70	61.80	61.10	61.3	0.87	0.80
MT 9516	FORTUNA/PONDERA/PONDE	62.85	63.01	63.66	59.80	61.13	62.20	62.10	62.50	61.70	62.1	0.87	0.88
MT 9517	FORTUNA/PONDERA/PONDE	60.67	61.74	63.03	58.33	60.53	62.20	60.10	61.80	61.80	61.1	1.06	0.87
MT 9524	LEW/PONDERA/PONDERA	62.05	60.97	63.82	59.40	61.93	62.90	61.50	62.30	61.50	61.8	0.87	0.75
MT 9532	LEW/PONDERA/PONDERA	63.32	62.47	64.31	61.20	62.20	63.60	62.20	63.50	62.20	62.8	0.68	0.76
MT 9533	LEW/PONDERA/PONDERA	61.28	59.76	63.67	58.47	60.27	62.30	60.40	60.80	61.50	60.9	1.02	0.70
MT 9539	LEW/PONDERA/PONDERA	60.53	61.06	62.76	58.07	60.53	61.00	60.60	60.80	62.00	60.8	0.95	0.84
MT 9541	LEW/PONDERA/PONDERA	60.23	61.43	62.34	56.87	60.20	61.50	60.00	61.80	60.30	60.5	1.25	0.92
MT 9542	NORANA/FORTUNA/NORAN	59.14	60.91	61.29	57.73	59.20	60.70	59.70	60.20	61.00	60.0	0.84	0.80
MT 9553	PONDERA/FORTUNA/PONDE	62.84	62.13	62.86	57.47	59.67	61.40	60.20	61.50	61.40	61.1	1.25	0.80
MT 9554	PONDERA/FORTUNA/PONDE	57.85	59.45	60.89	56.73	58.80	60.50	58.50	58.40	59.30	58.9	0.88	0.71
MT 9558	PONDERA/LEW/PONDERA	60.13	60.82	62.30	57.87	58.93	60.70	59.10	61.40	60.20	60.2	1.01	0.84
MT 9559	HI-LINE/PI372129//2*HI-LI	59.17	60.29	61.76	54.93	58.60	61.60	59.20	60.10	60.80	59.6	1.59	0.90
MT 9565	HI-LINE/PI372129//HI-LINE	60.99	61.56	63.55	57.67	60.93	62.90	62.50	61.30	62.90	61.6	1.27	0.80
MTRWA116	PI372129/2*PONDERA	60.68	60.55	62.99	57.20	59.87	61.40	59.40	61.30	61.60	60.6	1.24	0.86
ND 606	AMIDON	61.05	61.34	61.77	58.40	59.60	61.30	61.00	60.50	59.60	60.5	0.79	0.79
ND 673	TRENTON	59.93	60.86	63.08	56.60	59.93	60.90	61.60	61.40	60.70	60.6	1.37	0.91
ND 677	ERNEST	61.56	61.69	63.27	59.53	60.87	61.00	60.90	61.50	60.60	61.2	0.73	0.79
PI483236	GLENMAN	59.33	60.06	61.76	57.67	59.00	60.60	59.70	60.10	60.00	59.8	0.88	0.93
PI549275	HI-LINE	60.12	62.10	62.02	55.33	59.00	61.30	59.70	59.80	61.60	60.1	1.57	0.84
PI574642	MCNEAL	57.81	60.01	62.00	56.47	58.33	60.50	60.60	60.20	60.30	59.6	1.22	0.78
TR983239	FERGUS	62.21	61.34	62.17	57.07	60.47	61.50	61.40	62.70	60.10	61.0	1.20	0.76
WA 6920	PENAWAWA	58.46	59.61	61.97	57.40	58.67	61.40	58.70	59.90	60.10	59.6	1.01	0.72
WB 926	WESTBRED 926	61.78	60.14	61.23	57.67	59.13	61.00	60.00	60.40	59.30	60.1	0.83	0.67
WB 936	WESTBRED 936	61.51	61.10	61.85	56.60	58.87	60.20	59.20	61.20	60.50	60.1	1.22	0.82
WBEXPRES	WESTBRED EXPRESS	60.25	61.68	63.34	57.07	58.87	60.70	60.20	61.00	59.10	60.2	1.38	0.89
*****	SITE MEAN	60.67	61.09	62.38	57.83	59.84	61.14	60.54	60.99	60.57	60.6	1.00	1.00

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Table 3.

1996 HEADING DATE (DAYS FROM JAN.1 ) SUMMARY FOR THE ADVANCED SPRING WHEAT NURSERY GROWN ACROSS MONTANA

ID	PEDIGREE	HAVRE	SIDNEY DRY	SIDNEY IRR	MOCCASIN	CONRAD DRY	KALISPELL	BOZEMAN SRY	BOZEMAN IRR	AVERAGE	BYX	RSQ
BZ68423	VANNA	182.00	178.35	180.32	182.67	190.00	185.00	186.00	187.00	183.9	0.97	0.95
BZ987331	MSFRS SELECTION	178.00	173.67	177.32	180.00	185.00	183.00	183.00	183.00	180.4	0.97	0.94
BZ992588	RAMBO/906R	178.67	177.35	178.37	181.00	188.00	182.00	184.00	184.00	181.7	0.92	0.96
BZ992632	FORTUNA/906R	178.00	175.01	178.32	180.00	188.00	184.00	184.00	184.00	181.4	1.11	0.90
CI 10093	THATCHER	180.33	179.66	180.72	185.33	192.00	187.00	186.00	186.00	184.6	1.05	0.93
CI 13896	FORTUNA	179.00	177.98	178.99	182.00	188.00	185.00	185.00	185.00	182.6	0.96	1.00
CI 17429	LEW	181.33	180.00	181.35	185.33	192.00	187.00	187.00	187.00	185.1	1.04	0.97
CI 17430	NEWANA	181.00	179.65	181.64	184.33	191.00	188.00	187.00	187.00	185.0	1.03	0.98
CI 17790	LEN	180.00	179.04	180.02	183.00	188.00	186.00	186.00	186.00	183.4	0.88	0.99
MT 9311	MT7819/(OLAF/LEW)	183.33	181.35	182.39	186.00	193.00	186.00	189.00	189.00	186.3	1.00	0.94
MT 9332	MT7810/MT7926	180.00	178.67	179.88	183.67	190.00	184.00	187.00	187.00	183.8	1.04	0.96
MT 9407	MT8808/MARBERG	177.00	178.00	178.08	181.00	188.00	186.00	185.00	185.00	182.3	1.09	0.95
MT 9410	MT8808/MARBERG	177.67	176.70	177.36	181.00	187.00	184.00	184.00	184.00	181.5	1.01	1.00
MT 9420	MT8808/MARBERG	178.00	177.31	178.60	181.67	187.00	186.00	185.00	185.00	182.3	1.01	0.96
MT 9427	MT8808/MARBERG	177.00	174.99	177.01	179.00	186.00	180.00	183.00	184.00	180.1	0.98	0.93
MT 9430	MT8808/MARBERG	178.00	177.01	178.98	181.00	187.00	183.00	185.00	184.00	181.7	0.93	0.98
MT 9433	MT8808/MARBERG	179.67	178.99	179.71	183.33	189.00	186.00	186.00	186.00	183.6	0.98	0.99
MT 9453	GLENMAN/AMIDON	179.33	177.99	179.67	182.67	188.00	184.00	186.00	185.00	182.8	0.93	0.99
MT 9502	FTA/MBG/MBG	177.67	175.69	177.04	181.00	188.00	186.00	184.00	184.00	181.7	1.17	0.97
MT 9503	FORTUNA/NEWANA/NEWANA	182.00	179.66	181.93	186.00	191.00	187.00	187.00	188.00	185.2	0.98	0.98
MT 9504	FORTUNA/NEWANA/NEWANA	182.00	180.96	182.31	185.00	193.00	189.00	187.00	188.00	185.9	1.06	0.96
MT 9507	PONDERA/FORTUNA/PONDERA	176.67	176.34	177.05	179.67	186.00	183.00	183.00	183.00	180.6	0.95	0.99
MT 9508	FORTUNA/PONDERA/PONDERA	177.67	176.00	176.69	180.67	187.00	184.00	184.00	184.00	181.3	1.07	0.99
MT 9513	FORTUNA/PONDERA/PONDERA	178.00	176.68	177.64	181.00	188.00	186.00	184.00	183.00	181.8	1.06	0.94
MT 9515	FORTUNA/PONDERA/PONDERA	177.33	176.70	176.70	180.33	188.00	185.00	184.00	184.00	181.5	1.12	0.97
MT 9517	FORTUNA/PONDERA/PONDERA	178.00	176.99	177.66	181.33	185.00	185.00	184.00	184.00	181.5	0.88	0.93
MT 9524	LEW/PONDERA/PONDERA	177.00	175.01	176.58	180.00	187.00	181.00	184.00	183.00	180.4	1.06	0.96
MT 9532	LEW/PONDERA/PONDERA	178.00	177.31	177.67	180.67	187.00	185.00	184.00	184.00	181.7	0.98	0.98
MT 9533	LEW/PONDERA/PONDERA	177.00	175.68	175.99	180.33	186.00	182.00	184.00	183.00	180.5	1.02	0.99
MT 9539	LEW/PONDERA/PONDERA	178.67	177.66	177.67	181.67	188.00	183.00	185.00	185.00	182.1	1.00	0.98
MT 9541	LEW/PONDERA/PONDERA	177.67	176.70	176.73	180.67	187.00	183.00	184.00	185.00	181.3	1.04	0.98
MT 9542	NORANA/FORTUNA/NORANA	181.33	179.03	181.02	185.00	188.00	185.00	187.00	187.00	184.2	0.84	0.94
MT 9553	PONDERA/FORTUNA/PONDERA	178.00	176.98	177.63	181.00	186.00	183.00	184.00	185.00	181.3	0.87	0.95
MT 9554	PONDERA/FORTUNA/PONDERA	180.33	178.68	179.98	183.67	188.00	188.00	186.00	187.00	184.0	0.97	0.93
MT 9558	PONDERA/LEW/PONDERA	180.00	178.31	179.66	183.00	189.00	184.00	186.00	185.00	183.1	0.94	0.98
MT 9559	HI-LINE/PI372129/2*HI-LI	178.67	176.99	178.32	180.00	187.00	181.00	185.00	185.00	181.5	0.92	0.90
MT 9565	HI-LINE/PI372129/2*HI-LINE	177.33	175.01	176.93	180.67	187.00	186.00	184.00	184.00	181.4	1.16	0.95
MTRWA116	PI372129/2*PONDERA	177.33	176.30	176.99	180.67	187.00	184.00	184.00	184.00	181.3	1.06	1.00
ND 606	AMIDON	178.33	178.31	179.34	182.00	188.00	184.00	186.00	185.00	182.5	0.93	0.98
ND 673	TRENTON	178.67	178.31	178.72	183.67	188.00	185.00	185.00	185.00	182.8	0.96	0.97
ND 677	ERNEST	179.00	178.31	178.73	182.33	188.00	186.00	185.00	185.00	182.8	0.97	0.97
PI483235	GLENMAN	180.33	178.35	179.69	183.33	190.00	185.00	186.00	186.00	183.6	1.03	0.99
PI549275	HI-LINE	178.33	176.98	178.27	180.33	187.00	183.00	185.00	184.00	181.6	0.95	0.98
PI574642	MCNEAL	180.67	179.00	180.67	183.67	189.00	187.00	187.00	187.00	184.3	0.98	0.99
TR983239	FERGUS	178.67	175.32	177.37	180.00	187.00	182.00	184.00	183.00	180.9	0.98	0.96
WA 6920	PENAWAWA	180.00	178.00	179.34	182.00	188.00	185.00	186.00	185.00	182.9	0.94	0.99
WB 926	WESTBRED 926	176.33	173.67	176.07	179.00	186.00	182.00	182.00	182.00	179.6	1.07	0.99
WB 936	WESTBRED 936	177.33	174.01	176.62	180.00	186.00	180.00	184.00	184.00	180.2	1.05	0.92
WBEXPRES	WESTBRED EXPRESS	180.33	176.01	178.59	180.67	189.00	185.00	185.00	185.00	182.4	1.09	0.95
SITE MEAN		178.92	177.36	178.66	181.86	188.06	184.47	186.02	184.98	182.4	1.00	1.00

Table 4.  
1996 PLANT HEIGHT (INCHES) SUMMARY FOR THE ADVANCED SPRING WHEAT NURSERY GROWN ACROSS MONTANA

ID	PEDIGREE	HAVRE	SIDNEY DRY	SIDNEY IRR	MOCCASIN	HUNTLEY DRY	CONRAD DRY	KALISPELL	BOZEMAN DRY	BOZEMAN IRR	AVG	BYX	RSQ
BZ694-23	VANNA	26.60	23.92	32.10	23.33	28.00	29.91	31.63	28.48	31.31	28.4	0.84	0.94
BZ987331	MSFRS SELECTION	26.05	25.56	31.27	26.67	27.00	29.01	33.37	30.85	32.70	28.2	0.70	0.78
BZ882588	RAMBO/806R	27.49	25.47	32.22	26.00	28.00	31.82	32.70	28.82	32.33	29.4	0.78	0.88
BZ882632	FORTUNA/806R	27.28	26.92	35.37	26.00	28.00	33.51	33.33	29.82	33.94	30.5	0.93	0.84
CI 10003	THATCHER	32.73	33.85	41.12	25.33	30.00	40.82	46.60	36.08	40.01	36.2	1.63	0.87
CI 13696	FORTUNA	31.37	30.61	36.30	26.33	32.00	38.64	44.10	34.54	38.60	34.7	1.33	0.88
CI 17429	LEW	28.41	29.46	40.41	25.00	30.00	38.50	42.90	33.74	38.65	34.1	1.65	0.98
CI 17430	NEWANA	25.13	24.63	32.22	23.00	25.00	30.28	31.10	27.38	32.68	27.9	0.95	0.93
CI 17790	LEN	26.27	25.01	33.34	25.67	36.00	30.70	32.57	29.04	34.01	30.3	0.76	0.51
MT 9311	MT7819/(OLAF/LEW)	25.91	26.52	37.39	23.00	31.00	33.06	37.00	30.54	35.47	31.1	1.35	0.97
MT 9332	MT7810/MT7926	27.05	28.53	36.37	23.00	28.00	34.07	36.47	30.01	35.49	31.0	1.26	0.97
MT 9407	MT8808/MARBERG	30.54	30.81	37.61	27.33	34.00	38.39	38.73	33.32	36.45	34.1	1.03	0.93
MT 9410	MT8808/MARBERG	27.55	27.42	37.37	27.00	31.00	35.10	36.73	32.82	36.09	32.2	1.08	0.96
MT 9420	MT8808/MARBERG	28.80	29.45	38.55	26.00	31.00	36.45	38.70	34.43	38.11	33.1	1.14	0.88
MT 9427	MT8808/MARBERG	24.99	27.14	34.54	26.33	32.00	31.99	35.43	29.32	33.02	30.5	0.92	0.84
MT 9430	MT8808/MARBERG	29.52	31.38	36.64	27.67	33.00	36.49	39.90	33.85	36.80	33.8	0.99	0.93
MT 9433	MT8808/MARBERG	28.37	30.51	38.79	25.33	29.00	36.84	40.20	32.64	35.07	33.0	1.31	0.93
MT 9453	GLENMAN/AMIDON	28.85	29.44	39.28	26.00	35.00	36.61	40.03	33.63	36.02	33.8	1.22	0.91
MT 9502	FTA/MBG/MBG	26.86	26.95	34.36	24.67	32.00	31.43	34.27	28.67	33.35	30.3	0.90	0.88
MT 9503	FORTUNA/NEWANA/NEWANA	27.04	26.67	32.66	22.67	26.00	31.20	32.83	27.73	32.41	28.7	0.97	0.96
MT 9504	FORTUNA/NEWANA/NEWANA	26.07	24.48	32.99	23.33	25.00	32.48	31.37	27.27	32.68	28.4	1.00	0.80
MT 9507	PONDERA/FORTUNA/PONDERA	27.68	27.94	34.02	25.67	33.00	31.89	34.10	29.72	34.17	31.0	0.74	0.82
MT 9508	FORTUNA/PONDERA/PONDERA	28.85	25.37	33.94	26.33	31.00	30.98	32.80	29.33	33.76	30.2	0.76	0.83
MT 9513	FORTUNA/PONDERA/PONDERA	28.54	28.22	33.95	24.00	28.00	32.29	32.43	29.51	34.23	30.1	0.85	0.80
MT 9515	FORTUNA/PONDERA/PONDERA	26.53	27.13	33.41	23.00	28.00	31.38	31.90	29.16	33.96	29.4	0.92	0.93
MT 9517	FORTUNA/PONDERA/PONDERA	28.62	27.04	34.01	26.33	30.00	30.92	32.17	29.47	33.15	30.2	0.67	0.90
MT 9524	LEW/PONDERA/PONDERA	27.15	25.50	35.92	26.67	30.00	34.16	36.20	29.68	33.00	30.9	1.04	0.92
MT 9532	LEW/PONDERA/PONDERA	28.82	29.77	36.67	26.33	34.00	36.77	39.13	33.25	34.05	33.2	1.04	0.87
MT 9533	LEW/PONDERA/PONDERA	27.41	29.24	37.60	26.00	33.00	36.36	38.07	30.52	34.52	32.4	1.11	0.91
MT 9539	LEW/PONDERA/PONDERA	27.28	26.90	34.76	24.00	29.00	31.71	34.77	29.30	32.95	30.1	0.99	0.99
MT 9541	LEW/PONDERA/PONDERA	27.45	26.54	32.77	25.00	30.00	31.69	33.47	29.51	33.42	30.0	0.81	0.85
MT 9542	NORANA/FORTUNA/NORANA	25.22	25.44	33.31	22.00	25.00	32.05	33.47	28.18	32.50	28.7	1.12	0.85
MT 9553	PONDERA/FORTUNA/PONDERA	27.08	26.32	32.42	26.67	28.00	30.85	34.27	28.58	32.28	29.5	0.78	0.91
MT 9554	PONDERA/FORTUNA/PONDERA	26.45	26.16	33.86	24.00	15.00	31.18	32.83	28.38	32.79	28.0	1.09	0.52
MT 9558	PONDERA/LEW/PONDERA	28.42	28.11	35.59	25.33	31.00	32.28	32.97	30.34	34.32	30.9	0.83	0.80
MT 9559	HI-LINE/PI372129//2*HI-LI	25.69	23.31	31.67	23.00	30.00	28.98	31.50	27.19	31.25	28.1	0.84	0.84
MT 9565	HI-LINE/PI372129//HI-LINE	30.08	27.90	36.51	25.67	35.00	35.59	40.07	30.68	35.01	32.9	1.13	0.84
MTRWA116	PI372129//2*PONDERA	27.29	25.23	31.70	25.67	29.00	30.68	32.80	28.46	31.28	29.1	0.70	0.94
ND 606	AMIDON	29.75	32.68	40.47	25.67	29.00	37.39	43.17	35.17	37.84	34.6	1.45	0.89
ND 673	TRENTON	31.16	30.45	40.66	27.67	34.00	39.75	40.83	34.39	39.13	35.2	1.29	0.99
ND 677	ERNEST	26.77	29.40	40.06	26.33	35.00	36.39	41.33	34.68	38.81	34.5	1.38	0.95
PI483236	GLENMAN	28.49	28.00	34.07	23.67	18.00	31.81	33.37	27.83	34.00	28.8	1.04	0.53
PI549275	HI-LINE	24.85	24.42	31.94	22.33	27.00	28.97	31.10	27.15	30.51	27.6	0.88	0.98
PI574842	MCNEAL	27.57	25.86	34.58	25.00	28.00	32.42	33.83	28.47	34.07	30.0	0.97	0.95
TR883239	FERGUS	26.80	24.78	31.44	23.00	25.00	30.31	33.73	27.84	31.21	28.1	0.86	0.85
WA 6920	PENAWAWA	25.70	25.52	29.96	22.67	26.00	28.35	32.57	26.16	31.59	27.6	0.82	0.91
WB 926	WESTBRED 926	25.34	24.34	30.74	24.33	31.00	29.63	32.17	30.85	29.99	28.7	0.69	0.68
WB 936	WESTBRED 936	24.32	21.74	28.95	25.00	17.00	26.52	30.03	27.63	28.73	25.5	0.72	0.43
WBEXPRES	WESTBRED EXPRESS	23.44	22.42	29.81	22.33	23.00	26.67	27.80	26.09	27.69	25.5	0.69	0.88
	SITE MEAN	27.50	27.11	34.77	24.97	29.08	32.90	35.38	30.19	33.91	30.6	1.00	1.00

Table 5.

1996 GRAIN PROTEIN (%) SUMMARY FOR THE ADVANCED SPRING WHEAT NURSERY GROWN ACROSS MONTANA

ID	PEDIGREE	HAVRE	SIDNEY DRY	SIDNEY IRR	MOCCASIN	HUNTLEY DRY	CONRAD DRY	KALISPELL	BOZEMAN DRY	BOZEMAN IRR	AVG	BYX	RSQ
BZ684-23	VANNA	14.60	10.73	10.57	14.60	0.00	10.70	0.00	0.00	0.00	12.2	0.00	0.00
BZ987331	MSFRS SELECTION	16.10	12.17	12.87	16.77	16.67	13.10	11.80	15.20	14.80	14.3	1.11	0.90
BZ982688	RAMBO/906R	15.60	12.90	13.73	16.63	16.97	13.30	11.70	14.80	15.10	14.6	1.12	0.98
BZ992632	FORTUNA/906R	14.40	12.83	12.53	16.43	16.43	12.30	11.70	14.30	14.30	13.9	1.08	0.93
CI 10003	HATCHER	15.30	12.67	13.67	17.90	17.20	13.90	12.20	14.70	15.00	14.7	1.23	0.97
CI 13596	FORTUNA	14.60	12.63	14.43	15.47	16.43	14.10	12.60	14.50	15.20	14.4	0.76	0.86
CI 17429	LEW	14.80	12.97	13.80	17.43	16.70	13.80	11.80	14.50	14.40	14.6	1.09	0.93
CI 17430	NEWANA	13.60	11.90	12.63	16.93	16.77	13.20	11.60	14.90	13.90	13.8	1.11	0.91
CI 17790	LEN	15.20	13.27	14.33	17.30	16.60	13.80	13.30	15.10	15.40	14.9	0.89	0.95
MT 9311	MT7819/(OLAF/LEW)	15.00	12.63	13.13	16.27	16.13	14.00	12.00	14.60	13.80	14.2	0.92	0.92
MT 9332	MT7810/MT7926	15.20	12.70	13.87	16.67	16.67	13.90	12.00	14.80	14.30	14.4	1.00	0.96
MT 9407	MT8808/MARBERG	14.70	13.00	13.77	16.40	16.77	14.10	12.60	14.40	16.60	14.6	0.90	0.94
MT 9410	MT8808/MARBERG	15.00	12.80	12.67	16.63	16.90	13.80	12.60	14.40	15.00	14.3	0.91	0.93
MT 9420	MT8808/MARBERG	16.40	13.60	14.37	17.00	16.83	14.20	13.60	16.20	16.70	16.2	0.97	0.95
MT 9427	MT8808/MARBERG	15.80	13.60	14.80	17.07	16.63	14.60	12.60	15.90	16.70	16.2	0.91	0.95
MT 9430	MT8808/MARBERG	15.80	12.87	14.13	16.73	16.80	14.40	13.40	15.30	16.70	16.0	0.89	0.96
MT 9433	MT8808/MARBERG	15.70	12.93	13.93	16.90	17.33	14.80	12.80	15.60	16.30	16.0	1.01	0.95
MT 9453	GLENMAN/AMIDON	15.70	13.33	14.23	16.40	16.20	14.30	13.60	15.00	14.90	14.9	0.69	0.95
MT 9502	FTA/MBG/MBG	15.30	12.60	12.87	15.73	15.93	12.10	10.90	13.80	13.40	13.6	1.06	0.88
MT 9503	FORTUNA/NEWANA/NEWANA	13.60	12.53	12.87	16.10	16.63	13.30	11.30	14.40	13.60	13.8	1.02	0.89
MT 9504	FORTUNA/NEWANA/NEWANA	14.60	12.03	12.80	16.60	16.87	13.40	11.80	14.10	13.60	14.0	1.11	0.92
MT 9507	PONDERA/FORTUNA/PONDERA	16.10	13.20	13.80	16.10	16.20	13.80	12.20	16.60	16.40	14.8	0.95	0.86
MT 9508	FORTUNA/PONDERA/PONDERA	16.80	13.07	13.80	15.47	16.07	13.90	12.60	16.60	16.70	14.6	0.80	0.85
MT 9513	FORTUNA/PONDERA/PONDERA	14.60	12.30	13.27	15.47	15.13	12.80	11.40	14.30	16.10	13.8	0.89	0.92
MT 9516	FORTUNA/PONDERA/PONDERA	15.10	12.83	13.30	16.63	15.70	13.60	11.90	14.60	16.10	14.3	0.96	0.97
MT 9517	FORTUNA/PONDERA/PONDERA	14.70	12.73	13.53	17.07	15.30	13.20	12.80	14.60	15.40	14.4	0.87	0.87
MT 9524	LEW/PONDERA/PONDERA	15.40	12.73	13.73	17.47	16.30	14.00	11.90	15.00	15.90	14.7	1.13	0.96
MT 9532	LEW/PONDERA/PONDERA	16.10	13.63	14.47	17.83	17.40	14.70	13.70	16.20	16.80	15.6	1.00	0.96
MT 9533	LEW/PONDERA/PONDERA	15.60	13.47	14.40	17.17	16.63	14.50	11.80	15.30	15.80	15.0	1.02	0.93
MT 9539	LEW/PONDERA/PONDERA	14.80	12.80	13.63	17.67	16.80	13.60	10.60	14.70	13.80	14.2	1.18	0.85
MT 9541	LEW/PONDERA/PONDERA	16.30	12.73	13.53	18.07	15.83	13.80	12.30	14.60	16.60	14.6	1.10	0.90
MT 9542	NORANA/FORTUNA/NORANA	13.90	11.33	12.23	14.90	16.47	12.30	11.20	13.70	13.80	13.2	0.98	0.99
MT 9553	PONDERA/FORTUNA/PONDERA	13.80	12.20	12.97	16.73	16.70	13.10	11.80	14.00	14.20	13.8	1.00	0.94
MT 9554	PONDERA/FORTUNA/PONDERA	14.60	12.33	12.77	16.37	16.60	12.30	11.20	13.70	13.20	13.6	1.04	0.92
MT 9558	PONDERA/LEW/PONDERA	14.80	12.13	13.40	17.03	15.70	13.10	11.70	14.00	14.10	14.0	1.06	0.94
MT 9559	HI-LINE/PI372129/2*HI-LI	14.40	12.70	13.50	16.60	15.93	13.20	11.40	14.80	14.30	14.1	1.02	0.96
MT 9566	HI-LINE/PI372129/2*HI-LI	14.70	12.70	14.30	16.23	16.20	13.10	11.60	14.20	14.80	14.2	0.96	0.92
MTRWA116	PI372129/2*PONDERA	15.30	13.07	14.07	17.43	16.83	14.10	12.60	15.30	16.10	15.0	1.07	0.97
ND 606	AMIDON	14.80	12.50	13.83	15.50	15.93	13.90	12.60	14.80	15.30	14.4	0.77	0.93
ND 673	TRENTON	15.60	12.87	14.03	16.40	17.27	14.30	13.80	14.90	15.60	15.0	0.84	0.89
ND 677	ERNEST	16.10	12.80	13.97	16.00	17.10	14.90	12.40	15.30	16.40	14.9	0.94	0.84
PI483236	GLENMAN	13.80	12.23	12.67	15.80	16.83	12.80	11.60	13.40	13.60	13.6	0.94	0.96
PI549276	HI-LINE	16.30	13.07	13.63	17.10	16.60	14.10	12.20	16.40	16.40	14.8	1.05	0.99
PI574642	MCNEAL	14.70	13.17	13.80	16.87	17.00	13.80	12.60	14.70	16.20	14.6	0.97	0.96
TR983239	FERGUS	16.40	12.80	13.20	17.63	16.80	13.60	12.60	16.60	16.10	14.6	1.05	0.92
WA 6920	PENAWAWA	13.80	10.57	10.87	13.47	0.00	10.40	0.00	0.00	0.00	7.4	0.00	0.00
WB 926	WESTBRED 926	16.20	13.73	13.73	17.80	16.87	13.30	12.80	16.10	15.30	15.1	1.10	0.92
WB 936	WESTBRED 936	16.00	12.80	13.60	17.47	17.83	13.70	12.00	16.60	15.80	15.0	1.33	1.00
WBEXPRES	WESTBRED EXPRESS	15.10	12.80	13.93	15.47	17.17	13.30	11.60	14.70	16.20	14.4	1.01	0.89
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