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PROJECT TITLE: Long-Term Small Grain Variety Performance Evaluation Under Mechanical or Chemical Fallow Conditions Off-Station in Five Northern Montana Counties.

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OBJECTIVES:

Diverse cropping environments exist within that five-county area most closely served by this Research Center (Blaine, Chouteau, Hill, Liberty, and Phillips counties). Winter and spring wheat, barley, and oat production together in the five counties represents 28% of the 1994 statewide total (43% and 24% for winter and spring wheat alone, respectively). Producers are keenly interested in variety performance data generated under local conditions. It is our objective, within budget limitations, to evaluate small grain variety performance, over time, under conditions representative of specific areas of Northern Montana yet differing from those of the Research Center at Havre.

It is also our objective to develop and maintain databases which are not only specific to differing major crop environments, but which are further augmented by as much associated climatic and production management information as is practical and feasible to collect. Since 1982 we have recorded and reported supportive information of this nature along with the crop performance data for each investigation. However, a new standardized system was initiated in 1995 for better management and dissemination of such `base data' in more detail than that provided previously.

RESULTS:

Data details for individual trials conducted from 1982-1995 were included in respective previous annual reports, but long-term yield and test weight data from the past ten years are presented in abridged form for summary purposes here. For winter and spring wheat, selected variety performance comparisons on the basis of gross dollar return for these off-station locations as well as the principal statewide trials conducted on-station at Havre are normally included in full in a separate report. However, earlier report deadlines the past two years have impacted this effort where year-end wheat market data is involved and is not available until the first week in January.

1996 cropping environments ranged from poor to very good across North Central Montana. At Havre, total annual growing season precipitation (9/1/95 through 8/31/96) was 10.73 inches or 89 percent of the average for all years since 1916. April 1 through July 31 precipitation was 5.71 inches or 85 percent of the

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81-year average. However, heat units expressed as "Growing Degree Days" (GDD, base 50) were 97 percent of the average for the last 46 years (1951-1996). July-September, 1996 GDD values were 101 percent of normal; and less than average precipitation for the period provided for a harvest with very few weather delays. The last spring frost was 4 days early with the first fall frost 4 days late resulting in 136 frost free days - 8 days longer than the 81-year average. September 1995 through March 1996 precipitation was 121 percent of the long-term average, and stored soil moisture was generally good. The April through July growing season saw an average daily temperature at 58 degrees F or nearly normal, but April was substantially warmer than normal while May was substantially cooler than the long-term average. Maximum summer temperature was recorded on August 11 at 100 degrees F. Minimum winter temperature was -38 degrees F on February 3. Crop outlook was initially mixed with good soil moisture, but seemingly sluggish early crop development in April and May. Generally favorable conditions throughout the remainder of the season resulted in normal yields and higher than normal test weights.

Off-station cropping environments were variable in 1996. The Turner and Loring locations were extremely dry with North Havre also drier than normal. The Big Sandy and North Joplin locations had average to slightly above-average precipitation. Most locations recorded yields commensurate with moisture, and test weights were generally average to above for wheat and barley at all off-station locations except for barley at Big Sandy and both wheat and barley at North Joplin where test weights were reduced. Grain protein for appropriately-fertilized wheat and barley was generally very good.

Plant height, yield, test weight, and protein data for the Myers and Peterson dryland winter wheat trials conducted in 1996 are summarized in Tables 1 and 3, respectively. Multi-year yield and test weight summaries for selected winter wheat entries at the Myers and Peterson locations are presented in Tables 2 and 4, respectively.

Stand percent, plant height, yield, test weight and protein data for the 1996 Cederberg, Myers, Peterson, Graff and Flansaas/Lumsden dryland spring wheat trials are summarized in Tables 5, 7, 9, 11 and 13, respectively. The Flansaas/Lumsden location is a new one at Loring in Phillips County replacing the 10-year Solberg location at Dodson (1986-1995). The Cederberg location further features an identical trial under conditions of low fertility, but those comparisons are covered in a separate report under "Crop Fertility Investigations." Multi-year yield and test weight summaries for selected spring wheat entries at the Cederberg, Myers, Peterson, Graff, and Flansaas/Lumsden locations are presented in Tables 6, 8, 10, 12 and 14, respectively.

Stand percent, plant height, yield, test weight, plump/thin and protein data for the 1996 Cederberg, Myers, Peterson, Graff and FLansaas/Lumsden spring barley trials are summarized in Tables 15, 17, 19, 21 and 23, respectively. The Cederberg location further features an identical trial under conditions of low fertility, but those comparisons are covered in a separate report under "Crop Fertility Investigations." Multi-year yield and test weight summaries for selected barley entries at the Cederberg, Myers, Peterson, Graff, and Flansaas/Lumsden locations are presented in Tables 16, 18, 20, 22, and 24, respectively.

SUMMARY:

Fourteen 1996 off-station variety performance trials were conducted on mechanical or chemical fallow at five locations in five Northern Montana counties.

Dryland Winter Wheat Trials:

1.	Myers Farms, Inc., Chouteau County	(13W Big Sandy)	13-28N-10E
2.	M & N Peterson Farm, Hill County	(30NW Havre)	32-36N-13E

Dryland Spring Wheat Trials:

1.	*L. Cederberg Farm, Blaine County	(3NE Turner)	13-36N-25E
2.	Myers Farms, Inc., Chouteau County	(13W Big Sandy)	13-28N-10E
3.	M & N Peterson Farm, Hill County	(30NW Havre)	32-36N-13E
4.	Graff Farms, Inc., Liberty County	(14NW Joplin)	8-34N- 7E
5.	Flansaas/Lumsden Farm, Phillips Co	(1SW Loring)	24-35N-29E

Dryland Spring Barley Trials:

1.	*L. Cederberg Farm, Blaine County	(3NE Turner)	13-36N-25E
2.	Myers Farms, Inc., Chouteau County	(13W Big Sandy)	13-28N-10E
3.	M & N Peterson Farm, Hill County	(30NW Havre)	32-36N-13E
4.	Graff Farms, Inc., Liberty County	(14NW Joplin)	8-34N- 7E
5.	Flansaas/Lumsden Farm, Phillips Co	(1SW Loring)	24-35N-29E

* Denotes location of paired trials (one fertilized and reported here, plus another under low fertility with comparisons discussed in a separate report under "Crop Fertility Investigations."

All trials were seeded in replicated, 3-row, 20-foot plots on a 12-inch row spacing utilizing a self-propelled cone seeder. Winter wheat trials (1981-1991) were planted with hoe openers fitted with `Acra-Plant' or JD 3" shovels; and double-disk openers were used until 1987 for spring grains. From 1987-1991, all spring trials were planted with `Acra-Plant' hoe openers. Beginning with spring planting of 1992 trials, all off-station trials were planted with modified `Haybuster' openers. A randomized complete block design was standard for all trials with three replications. A `Hege 125C' plot combine, funded in part by MWBC in 1984, was used to harvest each 3-row plot after end-trimming to 16'. Prior to 1984, sixteen feet of the center row for each plot was harvested with a `Suzue' single-row binder and threshed with a `Vogel' thresher. Some 1991 plots were harvested via the former binder/thresher method due to breakdown of the Hege plot combine. Other variables specific to each individual trial are listed in the data tables.

FUTURE PLANS:

It is planned, budget allowing, to continue off-station cereal variety investigations in the five-county area. This work has been strongly supported by producers in the area and by the Northern Ag Research Center Advisory Committee. Budgets aside, current workload has dictated that the number of

replicated off-station trial locations be held to five; and data processed by the Center will be limited to trials where the Center performs all functions from planting to harvest. Packaged seed can likely again be provided to County Extension Agents as per their needs for non-replicated demonstrations at any additional locations. Such demonstrations will be for display and discussion use by the County Extension Agent; and performance data will not be collected or processed by the Research Center for any such demonstration plantings.

Efforts are continuing in the use of computer mapping to augment identification and selection of appropriate sites for off-station work. The Graff location in Liberty County was selected in this manner.

It is our current opinion that effort made to generate quality multi-year data at a few sites, carefully chosen to represent principal differences in average growing season conditions, is superior to an approach involving less concentrated work at greater numbers of locations. The concept of concentrating efforts at a single site representative of a vast area that yet differs from the Research Center has been on-going at the Peterson location in Northern Hill County. Additional screening of F4 winter wheat populations (not reported here) has been on-going at the Peterson location under leadership of P.L. Bruckner, Bozeman in cooperation with Carlson at NARC.

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TABLE 1. DRYLAND FALLOW WINTER WHEAT VARIETY EVALUATION NURSERY GROWN OFF-STATION AT MYERS FARMS, INC., BIG SANDY. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1996.

ID	VARIETY or SELECTION	WTRSURV % 1/	PLNT HT Inches	YIELD Bu/Ac	TESTWT Lbs/Bu	PROTEIN %	SAWFLY Rating 2/
S86-15	KESTREL	98.60	32.97	61.53	59.47	13.30	1.67
PI564761	ERHARDT	96.53	28.02	61.30	62.47	15.40	2.17
MT 91192	WWP4394/NUWEST//MT7431/MT	92.03	26.73	59.70	58.70	14.70	1.67
CI 17735	NORSTAR	97.23	39.08	58.07	60.40	14.60	2.33
PI478771	AGASSIZ	93.40	37.01	56.63	62.00	15.00	2.00
PI584526	JUDITH	92.70	29.88	55.77	59.07	14.30	3.00
RDW(SEL)	AC READYMADE	91.00	31.90	55.43	61.87	14.70	2.67
PI555458	PROMONTORY	84.73	27.93	50.07	63.13	13.00	3.33
PI517194	TIBER	76.40	31.02	48.63	61.60	14.40	1.67
PI586806	NUWEST	74.30	30.46	47.80	60.90	14.20	1.00
MT 9222	NUWEST/MT7869//NWN/MT7840	79.83	27.89	44.00	60.80	14.10	2.17
MT 88046	MCGUIRE	82.63	26.72	43.10	60.67	15.70	1.00
CI 17860	NEELEY	70.10	29.38	42.30	59.80	14.20	1.67
CI 17879	ROCKY	66.67	30.55	41.37	61.33	13.80	1.33
CI 17846	MANNING	70.13	27.86	40.87	61.07	13.50	3.67
RH78W296	BIGHORN	65.97	25.63	40.20	61.50	13.90	1.00
CI 15075	CENTURK	65.27	28.52	38.23	60.53	13.90	1.00
CI 17844	REDWIN	71.53	31.93	35.83	61.93	14.70	2.67
QT 542	QUANTUM 542	44.43	30.00	33.63	60.93	14.00	1.33
CI 17727	WESTON	47.23	30.43	28.73	62.07	14.10	1.67
MTS92042	RAMPART (sawfly resistant)	31.97	26.47	24.60	60.67	14.90	.33
PI559720	YUMA	36.80	25.30	22.10	61.20	12.90	1.00
MTSF2238	VANGUARD (sawfly resistant)	22.90	26.64	14.73	61.07	14.50	.00
CI 17952	HAWK	8.33	25.35	3.47	59.97	13.30	1.00
EXPERIMENTAL MEANS		69.20	29.49	42.00	60.96	14.21	1.72
C.V. 2: (S OF MEAN/MEAN)*100		8.57	3.22	10.82	.83	-	18.68
LSD (0.05)		16.87	2.70	12.93	1.43	-	.92

1/ Winter Survival Percent (based on percent plant occupancy at harvest)
2/ Sawfly Damage Rating (0=None, 4=Severe) Visual rating based on presence of cut stems, irrespective of harvest recoverability potential.

CLIMATIC and NURSERY MANAGEMENT DATA

Exp #: 96-3851-WW Field: OffSta Design: __RCB__ # Ents: 24 # Reps: 3 Plot-Obsrv: 54 sqft. Hvst-Obsrv: 48 sqft.
Qtr: ____SW____ Section: 13 Twnshp: 28 N Range: 10 E Latitude: 48.18 N Longitude: 110.40 W Elevation: 2800 ft.

Seeding Date: 09/29/95 Sd'g Depth: _.__ in. Depth to Moisture @ Sd'g: _.__ in. Moist Soil Depth @ Sd'g: 55.0+ in.
Soil Temp @ Sd'g: __._F @ 1 in. __._ @ 2 in. __._ @ 4 in. Soil Texture: SCL Soil Series: _____
Cropping System: _X_ Fallow ___ Recrop _X_ Full-Till ___ Reduced-Till ___ No-Till # Tillages: 3 # Chem Apps: 0
Cropping System Details: __1995 Fallow Season = 2x Tillage w/Sweeps & Harrows; 1x Tillage w/Sweeps, Harrows & Rods__
Cropping History: 1 Yr Ago = 95 = ____Fallow____ 2 Yrs Ago = 94 = _Winter Wheat_ 3 Yrs Ago = 93 = ____Fallow____
Fertilizer: 55#N,22#P2O5, 0#K2O/ac via NH3+11-52-0 inj'd in sep PP ops Fall95 Herbicide: _'Bronate' @ 1.5 pts/ac__
Harvest Date: 08/26/96 Root Penetration Depth: 40 in. Comments: __Pre-Plant Soil Analysis was Pre-Fertilization___

Depth	PRE-PLANT SOIL ANAL 09/11/95 Max Depth=48"								05/15/96	POST-HVST SOIL ANAL 08/26/96 (Max Depth=48"							
	in. PAW	pH	% OM	Lb/a NO3	ppm P	ppm K	ppm S	Soil Text	CEC Txt	in. PAW	in. PAW	pH	% OM	Lb/a NO3	ppm P	ppm K	ppm S	Soil Text	CEC Txt
0 -6"	.81	6.4	1.5	54	23	420	15	CL-	21.8	.78	.21	6.9	1.5	4	22	434	15	SCL-	21.7
6-24"	4.50			30			21	CL		2.88	1.27			18			29	SCL	
24-36"	2.80			28				CL		2.80	.96			28				CL-	
36-48"	2.04			132				CL		2.04	1.67			64				CL-	
TOTAL:	10.15			244						8.50	4.11			116					

Precipitation & Stored Soil Water Summary:
09/11/95 to Sd'g: 0.20 in. (0.20 in events =>.1 in.)
Sd'g to 05/15/96: 1.74 in. (1.65 in events =>.1 in.)
05/15/96 to Hvst: 5.41 in. (5.36 in events =>.1 in.)
Stnd Grwg Seas (04/01/96 to 14 days prior to Harvest Maturity: 8.04 in.) (8.00 in events =>.1 in.)
Post-Grwg Seas (14 days prior to Harvest Maturity to 08/26/96: 0.12 in.) (0.12 in events =>.1 in.)
Calc'd Initial Soil Water @ Sd'g: 10.35 in.
Measured Soil Water on 05/15/96: 8.50 in.
Measured Resid Soil Water @ Hvst: 4.11 in.

Adj'd Summary: Init GS H2O Inv + 'Init GS Inv to Hvst' Prec - Hvst Resid H2O - 'PostGS' Prec (Calc'd ET: 9.80 in.)

TABLE 2. TEN-YEAR YIELD AND TEST WEIGHT SUMMARY ON SELECTED ENTRIES FROM A FALLOW WINTER WHEAT VARIETY NURSERY GROWN OFF-STATION AT MYERS FARMS, INC., BIG SANDY. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1987-1996.

2/ VARIETY OR SELECTION	NO. OF YEARS TESTED 3/	1/ YIELD (BUSHELS PER ACRE) 1992	1993	1994	1995	1996	AVERAGE FOR YEARS TESTED	10-YR. COMPAR. AVERAGE YIELD 4/	PERCENT OF NORSTAR YIELD 5/	TEST WEIGHT (POUNDS PER BUSHEL) 1992	1993	1994	1995	1996	AVERAGE FOR YEARS TESTED	10-YR. COMPAR. AVERAGE TEST WT 4/	PERCENT OF NORSTAR TEST WT 5/
NA 000X RAM (P+)	4	22.1	-	-	-	-	41.8	55.6	128.1	59.8	-	-	-	-	58.9	59.2	97.1
ID 279 BLIZZARD	4	27.7	65.0	-	70.8	-	54.2	52.1	120.1	61.1	63.5	-	61.1	-	61.8	60.9	99.9
PI564761 ERHARDT	3	-	-	43.9	62.6	61.3	55.9	49.1	113.2	-	-	61.8	61.5	62.5	61.9	62.6	102.6
S86-15 KESTREL	4	-	61.1	41.8	70.8	61.5	58.8	48.3	111.2	-	62.3	58.1	61.1	59.5	60.3	60.0	98.4
QT 542 QUANTUM 542 (P)	6	32.3	72.8	44.6	52.7	33.6	50.6	47.9	110.2	59.8	62.5	61.0	60.1	60.9	60.8	60.6	99.4
CI 17860 NEELEY	9	29.2	71.0	42.5	55.1	42.3	46.5	46.5	107.0	59.5	62.8	60.5	60.3	59.8	60.8	60.8	99.6
PI584526 JUDITH	9	23.7	63.7	41.0	58.3	55.8	45.5	45.5	104.8	59.2	61.3	57.6	59.4	59.1	59.5	59.5	97.6
CI 17902 WINRIDGE	8	20.7	65.6	39.9	52.9	-	43.4	45.3	104.4	60.4	62.0	59.9	59.4	-	60.5	60.4	99.1
PI517194 TIBER	9	25.2	69.0	39.1	60.8	48.6	44.8	44.8	103.1	60.6	63.4	61.3	60.9	61.6	61.4	61.4	100.6
CI 17846 MANNING	5	21.4	66.4	43.2	63.9	40.9	47.2	44.6	102.7	61.0	61.7	61.1	59.9	61.1	60.9	60.8	99.7
PI518591 ARAPAHO (+)	4	20.8	64.0	45.9	44.0	-	43.7	44.2	101.7	58.3	61.6	60.8	58.9	-	59.9	59.6	97.7
PI478771 AGASSIZ	6	22.5	57.0	39.2	55.5	56.6	46.1	43.6	100.5	59.8	62.7	60.2	61.2	62.0	61.3	61.1	100.2
CI 17735 NORSTAR	9	18.3	63.2	37.0	53.2	58.1	43.4	43.4	100.0	60.7	63.9	59.3	61.2	60.4	61.0	61.0	100.0
CI 8885 CHEYENNE	5	23.1	-	-	-	-	35.4	42.9	98.8	60.5	-	-	-	-	61.0	61.1	100.2
CI 17879 ROCKY (P+)	9	24.3	71.1	43.8	45.3	41.4	42.8	42.8	98.7	59.8	62.8	61.8	59.9	61.3	61.3	61.3	100.4
RDW(sel) AC READYMADE	4	-	63.3	32.6	56.7	55.4	52.0	42.7	98.4	-	62.8	61.3	60.8	61.9	61.7	61.5	100.8
CI 13670 WINALTA	6	22.4	59.2	-	-	-	39.3	42.3	97.4	60.4	63.6	-	-	-	61.7	61.4	100.6
PI586806 NUWEST (hrd white)	5	-	-	38.9	58.8	47.8	47.9	42.0	96.7	-	-	59.7	60.9	60.9	60.5	60.8	99.6
CI 17940 ARCHER (P+)	6	22.5	61.7	43.7	47.0	-	37.5	41.9	96.5	58.8	61.7	60.5	59.0	-	59.8	59.8	98.0
CI 15075 CENTURK (+)	9	23.0	60.4	46.3	47.4	38.2	41.2	41.2	95.0	60.0	62.8	61.5	60.0	60.5	61.1	61.1	100.2
CI 13190 WARRIOR	5	24.3	55.8	-	-	-	35.6	40.9	94.2	60.1	62.3	-	-	-	60.8	60.4	99.0
CI 17727 WESTON	5	22.1	59.5	44.2	56.5	28.7	42.2	39.9	91.9	61.3	62.7	61.7	61.5	62.1	61.9	61.7	101.2
MT 7877 NORWIN	5	23.1	-	-	-	-	32.9	39.8	91.6	60.4	-	-	-	-	61.4	61.6	100.9
RH78W296 BIGHORN (P+)	7	23.0	65.8	41.2	56.9	40.2	43.5	39.8	91.6	60.2	62.8	60.2	60.2	61.5	60.9	60.7	99.5
NA 200 HAWK (P+)	9	24.0	64.3	44.0	40.2	3.5	37.9	37.9	87.2	60.5	62.4	63.1	61.5	60.0	61.3	61.3	100.5
CI 17844 REDWIN	9	25.2	55.0	32.1	46.2	35.8	37.7	37.7	86.9	60.9	62.3	61.3	60.9	61.9	61.4	61.4	100.6
MTS92042 RAMPART (swfly res	3	-	-	44.3	56.2	24.6	41.7	36.6	84.4	-	-	60.3	59.9	60.7	60.3	61.0	100.0
MTSF2238 VANGUARD (swfly re	3	-	-	41.8	51.1	14.7	35.9	31.5	72.6	-	-	60.8	59.9	61.1	60.6	61.3	100.4
MEAN (ENTRIES LISTED)		23.7	63.6	41.4	54.9	41.5	-	43.2	-	60.1	62.6	60.6	60.4	61.0	-	60.9	-
6/ Growing Season Precip. (in.)		7.60	12.3	6.47	14.63	8.16	7.95										
7/ Soil PAW (in.) to 4 ft. @Sdg.		5.30	5.26	8.79	5.75	6.93	7.10										
Total Plant Avail. Water (in.)		12.90	17.56	15.26	20.38	15.09	15.05										
Soil NO3 (lbs.) to SD @plntng.		NA	130.0	296.0	146.0	244.0											
Fertilizer Applied (# N)		50.0	55.0	56.0	55.0	55.0											
(# P2O5)		24.0	22.0	22.0	22.0	22.0											
(# K2O)		0.0	0.0	0.0	0.0	0.0											
(# S)		0.0	0.0	0.0	0.0	0.0											

Check variety is Norstar.

1/ See MCES Bulletin 1098 for the evaluation of other important variety performance characteristics to include protein, quality, winter hardiness, disease resistance, etc. before making variety selection decisions.

2/ P = Private variety, + = Protected variety.

3/ Only the most recent five years are shown, but summary calculations include all years noted.
The 1989 nursery was lost due to winter injury.
The 1991 crop suffered minor hail damage on two occasions (5/20 & 7/13).

4/ 10-yr. CA = (x/y) * z where x = average yield and test weight of the entry for years tested, y = average yield and test weight of Norstar for the samee years, and z = 10-yr. average yield and test weight for the check variety Norstar.

5/ Percent of Norstar yield and test weight for the same data years as those in which the entry was tested.

6/ April 1 to 14 days prior to harvest maturity.

7/ Depth of moist soil (ft.) * 2.00 in.PAW/ft except starting in 1987 where soil PAW values are actual gravimetric measurements.

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TABLE 3. DRYLAND FALLOW WINTER WHEAT VARIETY EVALUATION NURSERY GROWN OFF-STATION AT THE MARK & NANCY PETERSON FARM, NORTH HAVRE. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1996.

ID	VARIETY or SELECTION	WINSURV % 1/	PLNT HT Inches	YIELD Bu/Ac	TESTWT Lbs/Bu	PROTEIN %
MT 91192	WWP4394/NUWEST//MT7431/MT	85.40	23.66	49.53	60.70	13.40
S86-15	KESTREL	98.60	29.49	48.97	60.30	12.80
PI584526	JUDITH	93.73	25.49	46.40	60.10	13.70
PI564761	ERHARDT	89.23	24.33	45.30	63.30	14.60
CI 17735	NORSTAR	96.17	32.80	44.70	62.43	13.60
CI 17860	NEELEY	79.87	26.69	43.80	62.17	13.30
RDW(SEL)	AC READYMADE	88.90	27.80	43.10	63.03	14.10
PI478771	AGASSIZ	89.93	30.58	43.03	62.00	14.10
CI 17844	REDWIN	75.37	29.24	42.70	63.27	14.50
PI586806	NUWEST	72.57	27.36	40.03	62.67	13.70
MT 9222	NUWEST/MT7869//NWN/MT7840	76.03	23.44	39.17	61.23	13.40
RH78W296	BIGHORN	78.10	24.42	36.43	62.43	13.50
PI517194	TIBER	65.97	26.22	35.90	63.10	13.40
MT 88046	MCGUIRE	74.30	23.62	35.83	61.07	15.10
CI 15075	CENTURK	68.07	26.01	35.77	62.13	12.80
CI 17879	ROCKY	76.03	24.96	35.33	62.57	13.20
PI555458	PROMONTORY	77.43	23.33	33.23	63.17	13.10
CI 17727	WESTON	62.13	27.15	32.73	63.33	13.80
CI 17846	MANNING	54.17	25.42	32.03	62.13	13.20
CI 17952	HAWK	61.07	18.92	30.50	63.90	14.60
PI559720	YUMA	62.83	21.57	28.07	62.13	12.60
MTSF2238	VANGUARD (sawfly resistant)	55.57	23.90	27.77	61.73	14.40
QT 542	QUANTUM 542	50.70	25.34	27.37	62.03	13.80
MTS92042	RAMPART (sawfly resistant)	45.80	24.33	27.30	61.73	14.10
EXPERIMENTAL MEANS		74.08	25.67	37.71	62.19	13.70
C.V. 2: (S OF MEAN/MEAN)*100		9.83	3.24	10.55	.46	-
LSD (0.05)		20.72	2.37	11.33	.81	-

1/ Winter Survival Percent (based on percent plant occupancy at harvest)

CLIMATIC and NURSERY MANAGEMENT DATA

Exp #: 96-3852-WW Field: OffSta Design: __RCB__ # Ents: 24 # Reps: 3 Plot-Obsrv: 54 sqft. Hvst-Obsrv: 48 sqft.
Qtr: ___NENE___ Section: 32 Twnshp: 36 N Range: 13 E Latitude: 48.83 N Longitude: 110.03 W Elevation: 2800 ft.

Seeding Date: 10/03/95 Sd'g Depth: 1.00 in. Depth to Moisture @ Sd'g: 0.00 in. Moist Soil Depth @ Sd'g: 55.0+ in.
Soil Temp @ Sd'g: __.__F @ 1 in. 54.0F @ 2 in. 52.0F @ 4 in. Soil Texture: SCL Soil Series: _____
Cropping System: _X_ Fallow ___ Recrop ___ Pull-Till ___ Reduced-Till _X_ No-Till # Tillages: 0 # Chem Apps: 2
Cropping System Details: _____ 'Fallow Master' (32oz 5/23/95 + ammonium sulfate, 44oz 7/13/95 + ammonium sulfate)____
Cropping History: 1 Yr Ago = 95 = _Chem Fallow__ 2 Yrs Ago = 94 = _Winter Wheat_ 3 Yrs Ago = 93 = ____Fallow____
Fertilizer: 56#N,25#P2O5, 8#K2O/ac via BlueJet/coulter liquid inject. 08/20/95_ Herbicide: _'Bronate' @ 1.5 pts/ac_
Harvest Date: 08/27/96 Root Penetration Depth: 38 in. Comments: __Pre-Plant Soil Analysis was Post-Fertilization__

Depth	PRE-PLANT SOIL ANAL 09/17/95 Max Depth=48"									05/10/96	POST-HVST SOIL ANAL 08/27/96 (Max Depth=48"								
	in.		%	Lb/a	ppm	ppm	ppm	Soil	CEC	in.	in.		%	Lb/a	ppm	ppm	ppm	Soil	CEC
	PAW	pH	OM	NO3	P	K	S	Text	Txt	PAW	PAW	pH	OM	NO3	P	K	S	Text	Txt
0 -6"	.99	7.3	1.2	26	30	318	18	SCL	21.7	.63	.25	6.7	1.3	8	23	320	8	SCL	21.7
6-24"	3.82			36			22	CL		2.56	1.36			18			17	CL	
24-36"	2.12			36				CL		1.60	1.01			36				CL	
36-48"	2.11			60				CL		1.98	1.52			60				SCL	
TOTAL:	9.04			158						6.77	4.14			122					

Precipitation & Stored Soil Water Summary: 09/17/95 to Sd'g: 0.09 in. (0.00 in events =>.1 in.) Calc'd Initial Soil Water @ Sd'g: 9.13 in.
Sd'g to 05/10/96: 3.98 in. (3.89 in events =>.1 in.) Measured Soil Water on 05/10/96: 6.77 in.
05/10/96 to Hvst: 4.50 in. (4.19 in events =>.1 in.) Measured Resid Soil Water @ Hvst: 4.14 in.
Stnd Grwg Seas (04/01/96 to 14 days prior to Harvest Maturity: 5.36 in.) (4.96 in events =>.1 in.)
Post-Grwg Seas (14 days prior to Harvest Maturity to 08/27/96: 0.00 in.) (0.00 in events =>.1 in.)
Adj'd Summary: Init GS H2O Inv + 'Init GS Inv to Hvst' Prec - Hvst Resid H2O - 'PostGS' Prec (Calc'd ET: 7.13 in.)

TABLE 4. TEN-YEAR YIELD AND TEST WEIGHT SUMMARY ON SELECTED ENTRIES FROM A FALLOW WINTER WHEAT NURSERY GROWN OFF-STATION AT THE MARK AND NANCY PETERSON FARM, NORTH HAVRE. NORTHERN AGRICULTURAL RESEARCH CENTER, HAVRE, MONTANA. 1987-1996.

2/VARIETY OR SELECTION	NO. OF YEARS TESTED 3/	1/ YIELD (BUSHELS PER ACRE) 1992 4/	1993	1994	1995	1996	AVERAGE FOR YEARS TESTED	10-YR COMPAR. AVERAGE YIELD 5/	PERCENT OF NORSTAR YIELD 6/	TEST WEIGHT (POUNDS PER BUSHEL) 1992	1993	1994	1995	1996	AVERAGE FOR YEARS TESTED	10-YR COMPAR. AVERAGE TEST WT 5/	PERCENT OF NORSTAR TEST WT 6/
PI477287 RAM	3	23.4	-	-	-	-	41.9	44.5	114.1	58.3	-	-	-	-	56.0	56.7	94.1
CI 17860 NEELEY	8	26.0	64.2	50.4	46.0	43.8	43.3	43.3	111.1	60.3	62.2	60.1	56.2	62.2	59.6	59.6	99.0
PI586806 NUWEST (hrd white)	5	-	-	51.9	44.6	40.0	47.1	43.1	110.7	-	-	59.7	57.4	62.7	58.9	59.7	99.2
S86-15 KESTREL	4	-	56.2	48.6	51.0	49.0	51.2	43.1	110.5	-	62.0	57.3	55.8	60.3	58.8	58.5	97.3
PI564761 ERHARDT	3	-	-	45.4	46.2	45.3	45.6	42.6	109.3	-	-	61.6	56.9	63.3	60.6	61.3	101.8
ID 279 BLIZZARD	4	24.9	58.2	-	44.1	-	43.0	41.5	106.5	61.2	62.4	-	55.9	-	59.4	60.0	99.7
PI491533 NORWIN	4	19.4	-	-	-	-	32.7	40.4	103.6	60.8	-	-	-	-	59.9	60.2	100.1
PI584526 JUDITH	8	18.3	60.9	47.1	35.2	46.4	40.3	40.4	103.5	59.2	61.4	57.3	53.9	60.1	57.9	57.9	96.2
QT 542 QUANTUM 542 (P)	6	24.9	59.0	56.6	39.1	27.4	42.1	39.9	102.3	59.5	62.4	60.5	56.0	62.0	59.6	59.4	98.7
CI 17940 ARCHER (P+)	4	23.5	51.0	51.2	36.0	-	40.4	39.3	100.8	59.0	60.8	61.2	53.3	-	58.6	58.8	97.7
PI517194 TIBER	8	23.4	61.6	46.4	41.2	35.9	39.2	39.2	100.5	60.7	62.7	60.9	56.8	63.1	60.3	60.3	100.1
CI 17735 NORSTAR	8	19.8	60.1	44.8	35.8	44.7	39.0	39.0	100.0	60.3	63.3	59.6	56.6	62.4	60.2	60.2	100.0
CI 17592 HAWK (P+)	7	22.3	51.8	46.8	32.0	30.5	41.6	38.8	99.6	60.1	61.8	63.2	56.7	63.9	60.1	60.2	100.0
RDW(sel) AC READYMADE	4	-	51.3	45.8	44.4	43.1	46.1	38.8	99.6	-	62.4	60.9	57.7	63.0	61.0	60.7	100.8
CI 13190 WARRIOR	4	23.0	47.6	-	-	-	35.9	38.6	99.1	60.4	62.2	-	-	-	60.1	59.6	99.0
CI 17879 ROCKY (P+)	8	19.6	56.4	48.6	38.7	35.3	38.6	38.6	98.9	59.6	61.9	61.2	56.1	62.6	60.1	60.1	99.8
CI 13670 WINALTA	5	17.8	52.0	-	-	-	36.8	38.5	98.8	60.3	63.4	-	-	-	60.8	60.4	100.4
CI 16844 REDWIN	8	23.5	52.5	47.9	38.9	42.7	38.4	38.4	98.5	60.6	62.3	60.4	58.1	63.3	60.5	60.5	100.6
CI 17092 WINRIDGE	7	23.7	58.2	45.3	40.7	-	37.4	38.2	98.1	60.4	61.0	58.5	54.6	-	58.0	58.3	96.9
CI 15075 CENTURK (+)	8	20.4	55.3	49.6	32.4	35.8	37.7	37.7	96.8	60.6	61.8	61.7	54.9	62.1	59.9	59.9	99.5
RH78W296 BIGHORN (P+)	6	20.3	57.7	47.6	38.7	36.4	39.6	37.6	96.3	58.7	62.4	60.7	55.4	62.4	59.6	59.4	98.6
PI478771 AGASSIZ	6	20.9	52.5	44.5	30.6	43.0	39.8	37.1	95.1	60.5	62.4	60.6	58.2	62.0	60.2	60.3	100.1
PI518591 ARAPAHO (+)	4	19.7	47.7	47.9	36.9	-	38.0	37.0	94.8	58.9	60.8	61.2	55.4	-	59.1	59.3	98.5
MTS92042 RAMPART (swfly res	3	-	-	48.2	40.2	27.3	38.6	36.0	92.3	-	-	59.4	55.9	61.7	59.0	59.6	99.1
MTSF2238 VANGUARD (swfly re	3	-	-	44.4	37.3	27.8	36.5	34.0	87.3	-	-	60.8	55.1	61.7	59.2	59.8	99.4
CI 17727 WESTON	5	20.5	49.3	44.4	31.1	32.7	35.6	33.8	86.8	61.7	62.9	61.6	56.7	63.3	61.2	61.0	101.3
CI 17846 MANNING	5	20.9	53.9	44.9	33.8	32.0	30.7	29.2	74.8	60.6	61.3	60.5	53.5	62.1	59.6	59.3	98.6
MEAN (ENTRIES LISTED)		21.7	55.1	47.6	38.9	37.9	-	38.8	-	60.1	62.1	60.4	56.0	62.3	-	59.7	-
7/ Growing Season Precip. (in.)		4.16	12.05	6.09	10.86	5.36	7.01										
8/ Soil PAW (in.) to 4 ft. @Sdg		6.63	4.78	7.84	6.73	6.25	7.11										
Total Plant Avail. Water (in.)		10.79	16.83	13.93	17.59	11.61	14.11										
Soil NO3 (lbs.) to 4 ft. @Sdg.		NA	82.0	112.0	146.0	158.0											
Fertilizer Applied (#N)		42.0	70.5	40.0	30.0	56.0											
(#P2O5)		25.0	25.0	30.0	15.0	25.0											
(#K2O)		10.0	10.0	0.0	7.0	8.0											

Check variety is Norstar.

1/ See MCES Bulletin 1098 for the evaluation of other important variety performance characteristics to include protein, winter hardiness, disease resistance,etc.,before making variety selection decisions

2/ P = Private variety, + = Protected variety

3/ Only the five most recent years are shown, but summary calculations include all years noted.
Nursery was not planted because it was too wet to get into the field.
The 1989 nursery was lost due to winter injury.
The 1991 crop suffered substantial hail damage.

4/ The 1992 nursery suffered hail damage on 7/14. Values listed above are actual harvest yields and do not contain any adjustments for hail damage.

5/ 10-yr. CA = (x/y)*z where x = average yield and test weight of the entry for the years tested, y= average yield and test weight of Norstar for the same years, and z = 10-yr. average yield and test weight for the check variety Norstar.

6/ Percent of Norstar yield and test weight for the same data years as those in which the entry was tested.

7/ April 1 to 14 days prior to harvest maturity.

8/ Soil PAW values are actual gravimetric measurements.

Hr
GRC
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TABLE 5. FERTILIZED DRYLAND FALLOW SPRING WHEAT VARIETY EVALUATION NURSERY GROWN OFF-STATION AT THE LEON CEDERBERG FARM, TURNER. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1996.

ID	VARIETY or SELECTION	STAND %	PLNT HT Inches	YIELD Bu/Ac	TEST WT Lbs/Bu	PROTEIN %
BZ684-23	VANNA (Soft White)	88.57	19.55	30.47	58.87	12.73
PI483235	GLENMAN	95.47	20.88	30.10	59.03	14.57
CI 17430	NEWANA	84.40	19.75	29.90	61.53	15.33
PI549275	HI-LINE	91.00	19.68	29.70	59.80	15.77
ND 606	AMIDON	90.63	23.06	29.27	60.50	15.53
PI574642	MCNEAL	88.90	21.72	29.07	59.20	15.53
MT 9433	MT8808/MARBERG	91.63	21.67	28.77	60.70	16.07
ND 582	STOA	93.40	21.96	28.70	59.27	15.70
CI 17429	LEW	94.80	23.45	28.60	61.33	15.57
ND 677	ERNEST	87.13	22.26	28.43	61.40	15.93
MT 9311	MT7819/(OLAF/LEW)	79.87	21.94	28.33	62.03	14.90
MT 9565	HI-LINE/PI372129//HI-LINE	97.90	20.30	27.87	60.13	15.13
CI 17790	LEN	94.83	20.29	27.70	60.60	15.77
PNR 2375	PIONEER 2375	95.50	19.45	27.67	61.13	15.23
CI 13596	FORTUNA	88.87	22.85	27.33	62.03	16.17
WBEXPRES	WESTBRED EXPRESS	93.03	19.20	27.30	59.67	15.83
MTHW9420	MT8182/MT8289 (Hard White)	94.80	17.87	27.30	60.40	15.17
MT 9410	MT8808/MARBERG	90.97	23.43	27.10	61.40	14.93
MTHW9503	MT8182/MT8289 (Hard White)	97.20	19.99	26.57	59.60	16.37
WB 926	WESTBRED 926	88.90	19.11	26.23	60.27	16.17
ND 673	TRENTON	89.23	23.32	25.77	61.03	15.77
C982-324	RAMBO	95.83	19.62	25.50	61.20	15.03
ND 626	GRANDIN	93.40	22.09	24.70	60.93	15.80
TR983239	FERGUS	95.17	19.61	24.37	61.30	16.30
WB 936	WESTBRED 936	87.83	18.90	24.17	60.20	16.00
EXPERIMENTAL MEANS		91.57	20.88	27.64	60.54	15.49
C.V. 2: (S OF MEAN/MEAN)*100		3.94	2.44	5.51	.30	1.16
LSD (0.05)		10.25	1.45	4.33	.51	.51

CLIMATIC and NURSERY MANAGEMENT DATA

Exp #: 96-9951-SW Field: OffSta Design: __RCB__ # Ents: 25 # Reps: 3 Plot-Obsrv: 54 sqft. Hvst-Obsrv: 48 sqft.
Qtr: ____SE____ Section: 13 Twnshp: 36 N Range: 25 E Latitude: 48.88 N Longitude: 108.39 W Elevation: 2900 ft.

Seeding Date: 05/13/96 Sd'g Depth: 1.50 in. Depth to Moisture @ Sd'g: 0.50 in. Moist Soil Depth @ Sd'g: 55.0+ in.
Soil Temp @ Sd'g: __._F @ 1 in. 59.0F @ 2 in. 56.0F @ 4 in. Soil Texture: SCL Soil Series: _____
Cropping System: _X_ Fallow ___ Recrop _X_ Full-Till ___ Reduced-Till ___ No-Till # Tillages: 4 # Chem Apps: 0
Cropping System Details: __1995 Fallow Season = 3x Tillage w/Sweeps & Harrows, 1x Tillage w/Sweeps, Rods & Harrows__
Cropping History: 1 Yr Ago = 95 = ____Fallow____ 2 Yrs Ago = 94 = _____Durum____ 3 Yrs Ago = 93 = ____Fallow____
Fertilizer: 71#N,35#P2O5, 0#K2O/ac via gran.blend bnd'd 1.5" below seed_ Herbicide: _'BanvelSGF'+LV6 @4.26+6.4oz/ac_
Harvest Date: 09/04/96 Root Penetration Depth: 36 in. Comments: __Pre-Plant Soil Analysis was Pre-Fertilization___

Depth	PRE-PLANT SOIL ANAL 05/13/96 Max Depth=48"								__/__/__	POST-HVST SOIL ANAL 10/18/96 (Max Depth=48"							
	in. PAW	pH	% OM	Lb/a NO3	ppm P	ppm K	ppm S	Soil Text	CEC Txt	in. PAW	in. PAW	pH	% OM	Lb/a NO3	ppm P	ppm K	ppm S	Soil Text	CEC Txt
0 -6"	.83	5.7	2.0	20	25	341	5	SCL-	21.7	_____	.82	6.4	1.4	6	22	302	9	SCL-	21.7
6-24"	3.12			18			13	CL-		_____	2.28			24			16	CL	
24-36"	2.05			12				CL		_____	.88			4				CL	
36-48"	1.81			4				CL		_____	1.46			8				CL	
TOTAL:	7.81			54						_____	5.44			42					

Precipitation & Stored Soil Water Summary: 05/13/96 to Sd'g: 0.00 in. (0.00 in events =>.1 in.) Calc'd Initial Soil Water @ Sd'g: 7.81 in.
05/13/96 to Hvst: 3.62 in. (2.89 in events =>.1 in.) Measured Resid Soil Water @10/18: 5.44 in.
Growing Season (05/13/96 to 14 days prior to Harvest Maturity: 3.62 in.) (2.89 in events =>.1 in.)
Post-Grwg Seas (14 days prior to Harvest Maturity to 10/18/96: 2.63 in.) (2.40 in events =>.1 in.)
Adj'd Summary: Init GS H2O Inv + 'Init GS Inv to Smpl' Prec - Smpl Resid H2O - 'PostGS' Prec (Calc'd ET: 8.62 in.)

TABLE 6. TEN-YEAR YIELD AND TEST WEIGHT SUMMARY ON SELECTED ENTRIES FROM A FALLOW SPRING WHEAT VARIETY NURSERY GROWN OFF-STATION ON A 'TELSTAD' SOIL AT THE LEON CEDERBERG FARM, TURNER. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1987-1996.

		1/ YIELD (BUSHELS PER ACRE)								TEST WEIGHT (POUNDS PER BUSHEL)							
2/ VARIETY OR SELECTION	NO. OF YEARS TESTED 3/	1992	1993	1994	1995	1996	AVERAGE FOR YEARS TESTED	10-YR. COMPAR. AVERAGE YIELD 4/	PERCENT OF FORTUNA YIELD 5/	1992	1993	1994	1995	1996	AVERAGE FOR YEARS TESTED	10-YR. COMPAR. AVERAGE TEST WT 4/	PERCENT OF FORTUNA TEST WT 5/
PI483235 GLENMAN	10	57.3	52.6	37.5	56.8	30.1	39.9	39.9	128.9	57.6	57.7	57.7	58.6	59.0	58.5	58.5	97.5
WA 6920 PENAWAWA (sfwh	6	58.7	67.6	34.4	-	-	43.0	39.2	126.6	58.5	58.4	57.2	-	-	58.0	58.4	97.4
CI 17904 OWENS(sft wht)	8	53.9	62.6	36.5	-	-	37.5	38.7	125.2	56.3	58.2	57.2	-	-	58.4	58.7	97.8
PI574642 McNEAL	5	53.8	54.2	30.3	57.6	29.1	45.0	38.2	123.5	58.7	59.4	57.1	59.9	59.2	58.9	58.6	97.7
CI 17430 NEWANA	10	55.2	52.3	36.3	55.8	29.9	37.4	37.4	120.8	59.3	58.8	58.6	59.5	61.5	59.6	59.6	99.3
ND 606 AMIDON	8	54.1	54.8	32.3	52.1	29.3	40.3	36.4	117.8	59.1	58.4	58.5	59.6	60.5	58.9	58.9	98.2
CI 17828 PONDERA	9	47.6	46.2	36.4	56.0	-	35.5	35.1	113.4	60.6	59.5	58.9	60.0	-	59.6	59.8	99.7
ND 626 GRANDIN	7	55.7	48.5	34.6	49.5	24.7	40.2	35.1	113.4	59.7	58.6	58.8	57.8	60.9	59.0	59.2	98.6
WPB 926R WSTBRD926 (P+)	7	51.0	48.9	35.6	54.3	26.2	40.1	35.0	113.1	58.6	58.8	57.8	57.8	60.3	58.4	58.6	97.7
CI 17790 LEN	10	46.4	46.0	31.7	50.3	27.7	34.8	34.8	112.6	59.3	59.3	57.5	58.2	60.6	58.9	58.9	98.1
PI549275 HI-LINE	9	49.8	47.9	30.6	57.2	29.7	36.0	34.7	112.2	58.8	58.6	57.3	59.8	59.8	58.9	58.7	97.8
ND 677 ERNEST	3	-	-	33.8	52.4	28.4	38.2	34.5	111.5	-	-	59.9	59.7	61.4	60.3	59.5	99.1
ND 618 GUS	4	50.6	44.7	-	-	-	40.5	34.4	111.3	58.8	58.1	-	-	-	58.5	59.4	99.1
ND 582 STOA	10	50.3	48.2	33.9	47.6	28.7	34.4	34.4	111.3	58.1	57.9	57.7	58.0	59.3	58.7	58.7	97.9
PI486139 KLASIC (P+) hw	3	45.9	39.8	37.7	-	-	41.1	34.1	110.1	58.8	56.2	57.5	-	-	57.5	57.9	96.6
CI 17910 ALEX	4	-	-	-	-	-	23.2	34.0	109.9	-	-	-	-	-	60.6	60.7	101.2
CI 17429 LEW	10	46.0	45.9	31.5	40.0	28.6	33.8	33.8	109.3	60.9	59.5	59.6	60.9	61.3	60.5	60.5	100.8
C982-324 RAMBO (P+)	10	48.0	49.7	34.2	49.3	25.5	33.5	33.5	108.4	58.7	59.8	59.7	59.8	61.2	60.0	60.0	100.0
CI 15930 OLAF	7	48.0	41.8	-	-	-	31.1	32.6	105.3	58.2	57.9	-	-	-	58.6	59.0	98.3
CANLANC LANCER	7	43.8	41.1	28.3	-	-	31.9	31.7	102.3	59.4	59.0	59.2	-	-	59.5	59.6	99.3
CI 17920 MARSHALL	3	-	-	-	-	-	20.4	31.1	100.7	-	-	-	-	-	59.9	59.5	99.2
CI 13596 FORTUNA	10	42.3	37.1	32.8	42.7	27.3	30.9	30.9	100.0	60.4	58.1	60.1	60.5	62.0	60.0	60.0	100.0
NDCUT CUTLESS	8	44.5	40.1	29.5	-	-	28.5	29.5	95.4	58.1	58.2	60.1	-	-	59.0	59.3	98.8
WPB 906R WSTBRD906 (P+)	3	-	-	-	-	-	18.9	27.5	88.9	-	-	-	-	-	60.2	59.9	99.8
MEAN (ENTRIES LISTED)		50.2	48.5	33.6	51.5	28.1	-	34.4	-	58.9	58.5	58.4	59.3	60.5	-	59.2	-
6/ Growing Season Precip. (in.)		7.77	9.60	3.93	8.71	3.62	7.09										
7/ Soil PAW (in.) to SD @Plntng.		5.52	7.24	6.84	5.09	6.01	6.46										
Total Plant Avail. Water (in.)		13.29	16.84	10.77	13.80	9.63	13.56										
Soil NO3 (lbs.) to SD @Plntng.		112.0	52.0	28.0	54.0	54											
SD (Sampling Depth in inches)		48.0	48.0	48.0	48.0	48.0											
Fertilizer Applied (# N)		70.0	62.0	66.0	66.0	71.0											
(# P2O5)		40.0	35.0	33.0	33.0	35.0											

Check variety is Fortuna.

1/ See MCES Bulletin 1093 for evaluation of other important variety performance characteristics to include protein, quality, disease resistance, etc. before making variety selection decisions.

2/ P = Private variety, + = Protected variety.

3/ Only the five most recent years shown, but all years used in summary calculations.

4/ 10-yr. CA = (x/y) * z where x = average yield or test weight of the entry for years tested, y = average yield or test weight for Fortuna for the same years, and z = 10-yr. average yield or test weight for the check variety Fortuna.

5/ Percent of Fortuna yield or test weight for the same data years as those in which the entry was tested.

6/ Seeding to 14 days prior to harvest maturity.

7/ Soil PAW values are actual gravimetric measurements.

Hr
GRC
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TABLE 7. DRYLAND FALLOW SPRING WHEAT VARIETY EVALUATION NURSERY GROWN OFF-STATION AT MYERS FARMS, INC., BIG SANDY. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1996.

ID	VARIETY or SELECTION	STAND %	PLNT HT Inches	YIELD Bu/Ac	TEST WT Lbs/Bu	PROTEIN %
MT 9565	HI-LINE/PI372129//HI-LINE	99.30	31.31	49.40	61.83	15.00
WBEXPRES	WESTBRED EXPRESS	100.00	25.10	48.70	60.10	14.90
PNR 2375	PIONEER 2375	100.00	26.96	47.97	60.90	14.80
MTHW9503	MT8182/MT8289 (Hard White)	100.00	26.17	47.67	58.83	15.10
BZ684-23	VANNA (Soft White)	99.30	25.41	47.67	58.10	12.90
WB 936	WESTBRED 936	99.30	23.37	46.80	58.60	15.50
TR983239	FERGUS	100.00	26.78	46.60	59.40	15.40
ND 606	AMIDON	100.00	31.35	46.47	60.70	15.10
MTHW9420	MT8182/MT8289 (Hard White)	100.00	24.91	46.20	57.97	15.40
PI483235	GLENMAN	100.00	27.62	46.10	59.40	14.30
PI549275	HI-LINE	100.00	27.10	46.03	58.73	15.40
ND 582	STOA	100.00	30.87	45.50	59.37	15.80
MT 9410	MT8808/MARBERG	98.60	31.84	45.23	61.00	14.90
ND 673	TRENTON	99.30	32.41	44.60	61.00	15.70
MT 9433	MT8808/MARBERG	100.00	31.89	44.50	60.40	16.20
PI574642	MCNEAL	99.30	27.55	44.07	59.00	15.90
ND 677	ERNEST	100.00	30.92	43.27	61.93	15.80
WB 926	WESTBRED 926	100.00	24.59	42.73	57.37	16.60
C982-324	RAMBO	99.30	25.14	42.63	60.23	14.60
ND 626	GRANDIN	99.30	28.71	42.60	60.13	15.70
MT 9311	MT7819/(OLAF/LEW)	97.93	29.67	41.10	61.23	15.30
CI 17430	NEWANA	99.30	25.97	40.93	60.27	15.00
CI 17429	LEW	100.00	32.69	40.13	61.60	15.50
CI 17790	LEN	99.30	26.50	39.77	59.43	15.70
CI 13596	FORTUNA	99.67	33.04	39.23	62.23	16.00
EXPERIMENTAL MEANS		99.60	28.32	44.64	59.99	15.30
C.V. 2: (S OF MEAN/MEAN)*100		.61	1.68	3.58	.80	-
LSD (0.05)		1.74	1.35	4.54	1.36	-

CLIMATIC and NURSERY MANAGEMENT DATA

Exp #: 96-9952-SW Field: OffSta Design: __RCB__ # Ents: 25 # Reps: 3 Plot-Obsrv: 54 sqft. Hvst-Obsrv: 48 sqft.
Qtr: ____SW____ Section: 13 Twnshp: 28 N Range: 10 E Latitude: 48.18 N Longitude: 110.40 W Elevation: 2800 ft.

Seeding Date: 05/15/96 Sd'g Depth: 1.25 in. Depth to Moisture @ Sd'g: 0.25 in. Moist Soil Depth @ Sd'g: 55.0+ in.
Soil Temp @ Sd'g: __._F @ 1 in. 64.0F @ 2 in. 58.0F @ 4 in. Soil Texture: VFSL Soil Series: _____
Cropping System: _X_ Fallow ___ Recrop _X_ Full-Till ___ Reduced-Till ___ No-Till # Tillages: 3 # Chem Apps: 0
Cropping System Details: __1995 Fallow Season = 2x Tillage w/Sweeps & Harrows; 1x Tillage w/Sweeps, Harrows & Rods__
Cropping History: 1 Yr Ago = 95 = ____Fallow____ 2 Yrs Ago = 94 = _Winter Wheat_ 3 Yrs Ago = 93 = ____Fallow___
Fertilizer: 55#N,22#P2O5, 0#K2O/ac via NH3+11-52-0 inj'd in sep PP ops Fall95 Herbicide: _'Bronate' @ 1.5 pts/ac__
Harvest Date: 08/26/96 Root Penetration Depth: 42 in. Comments: __Pre-Plant Soil Analysis was Post-Fertilization__

Depth	PRE-PLANT SOIL ANAL 05/15/96 Max Depth=48"									__/__/__	POST-HVST SOIL ANAL 08/26/96 (Max Depth=48"								
	in. PAW	pH	% OM	Lb/a NO3	ppm P	ppm K	ppm S	Soil Text	CEC Txt	in. PAW	in. PAW	pH	% OM	Lb/a NO3	ppm P	ppm K	ppm S	Soil Text	CEC Txt
0 -6"	.88	6.7	1.6	10	22	471	5	VFSL	14.5	_____	.21	6.9	1.0	6	18	445	7	SCL-	21.7
6-24"	3.29			90			17	VFSL+		_____	1.21			24			41	SCL	
24-36"	2.80			28				CL		_____	1.63			76				CL	
36-48"	2.04			132				CL		_____	1.89			64				CL	
TOTAL:	9.01			260						_____	4.94			170					

Precipitation & Stored Soil Water Summary: 05/15/96 to Sd'g: 0.00 in. (0.00 in events =>.1 in.) Calc'd Initial Soil Water @ Sd'g: 9.01 in.
05/15/96 to Hvst: 5.41 in. (5.36 in events =>.1 in.) Measured Resid Soil Water @ Hvst: 4.94 in.
Growing Season (05/15/96 to 14 days prior to Harvest Maturity: 8.04 in.) (8.00 in events =>.1 in.)
Post-Grwg Seas (14 days prior to Harvest Maturity to 08/26/96: 0.12 in.) (0.12 in events =>.1 in.)
Adj'd Summary: Init GS H2O Inv + 'Init GS Inv to Hvst' Prec - Hvst Resid H2O - 'PostGS' Prec (Calc'd ET: 12.23 in.)

TABLE 8. NINE-YEAR YIELD AND TEST WEIGHT SUMMARY ON SELECTED ENTRIES FROM A FALLOW SPRING WHEAT NURSERY GROWN OFF-STATION AT MYERS FARMS, INC., BIG SANDY. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1988-1996.

2/ VARIETY OR SELECTION	NO. OF YEARS TESTED 3/	1/ YIELD (BUSHELS PER ACRE) 1992 5/	1993	1994 4/	1995	1996	AVERAGE FOR YEARS TESTED	9-YR COMPAR. AVERAGE YIELD 6/	PERCENT OF FORTUNA YIELD 7/	TEST WEIGHT (POUNDS PER BUSHEL) 1992 5/	1993	1994 4/	1995	1996	AVERAGE FOR YEARS TESTED	9-YR COMPAR. AVERAGE TEST WT. 6/	PERCENT OF FORTUNA TEST WT. 7/
ND 618 GUS	3	-	54.9	-	-	-	41.0	41.3	131.6	-	56.5	-	-	-	55.9	58.2	99.2
CI 17910 ALEX	3	-	-	-	-	-	27.9	41.1	131.0	-	-	-	-	-	58.5	59.7	101.8
CI 17904 OWENS (sft wht)	6	-	60.7	33.1	-	-	37.1	40.6	129.2	-	55.8	55.1	-	-	56.3	57.4	97.8
WA 6920 PENAWAWA (sft wht)	5	-	66.5	35.3	-	-	43.0	40.4	128.7	-	55.7	55.3	-	-	54.3	55.8	95.1
PI574642 McNEAL	4	-	59.2	35.2	56.7	44.1	48.8	39.1	124.5	-	57.1	55.6	61.0	59.0	58.2	56.7	96.6
ND 606 AMIDON	7	-	56.1	32.6	56.2	46.5	43.7	39.1	124.5	-	55.0	57.1	60.8	60.7	57.2	57.5	97.9
WPB 926R WESTBRED 926 (P+)	6	-	52.6	36.6	54.6	42.7	41.6	38.3	121.9	-	56.3	55.8	60.4	57.4	57.0	56.9	97.0
PI549275 HI-LINE	8	-	55.4	34.0	57.8	46.0	38.1	38.1	121.3	-	56.4	54.4	61.0	58.7	57.6	57.6	98.2
WPB 906R WESTBRED 906 (P+)	3	-	-	-	-	-	25.7	37.8	120.4	-	-	-	-	-	57.6	58.8	100.1
ND 626 GRANDIN	6	-	58.5	34.0	52.3	42.6	40.7	37.5	119.3	-	56.6	55.0	61.1	60.1	57.4	57.3	97.6
ND 582 STOA	8	-	57.6	30.1	48.4	45.5	37.4	37.4	119.2	-	56.4	55.6	59.5	59.4	57.2	57.2	97.4
ND 677 ERNEST	3	-	-	31.2	51.8	43.3	42.1	35.7	113.7	-	-	58.0	61.5	61.9	60.5	58.1	99.0
PI483235 GLENMAN	8	-	52.4	33.7	52.9	46.1	35.4	35.4	113.0	-	56.2	55.6	59.1	59.4	56.9	56.9	96.9
CI 17828 PONDERA	7	-	50.8	32.2	48.9	-	34.1	35.4	112.8	-	56.8	57.5	61.6	-	58.4	58.9	100.3
C982-324 RAMBO (P+)	8	-	46.5	29.6	54.1	42.6	34.9	34.9	111.3	-	57.4	57.6	60.6	60.2	57.8	57.8	98.4
CI 17430 NEWANA	8	-	53.6	34.6	55.8	40.9	34.9	34.9	111.1	-	56.1	56.2	60.2	60.3	57.7	57.7	98.3
CI 15930 OLAF	5	-	45.2	-	-	-	30.6	34.3	109.1	-	56.6	-	-	-	56.0	57.5	97.9
CI 17790 LEN	8	-	44.5	29.7	49.2	39.8	32.8	32.8	104.5	-	55.3	55.1	59.3	59.4	57.0	57.0	97.2
CI 17429 LEW	8	-	47.8	30.9	43.4	40.1	32.8	32.8	104.4	-	58.3	57.2	62.4	61.6	58.7	58.7	100.1
ND CUT CUTLESS	6	-	43.7	30.7	-	-	29.1	31.8	101.4	-	54.2	56.4	-	-	56.6	57.6	98.2
CI 13596 FORTUNA	8	-	45.7	32.4	39.4	39.2	31.4	31.4	100.0	-	57.5	59.5	61.6	62.2	58.7	58.7	100.0
CANLANC LANCER	6	-	41.6	30.2	-	-	27.5	30.1	95.8	-	56.4	58.2	-	-	57.3	58.3	99.4
MEANS (ENTRIES LISTED)		-	52.3	32.6	51.6	43.0	-	36.4	-	-	56.3	56.4	60.7	60.0	-	57.7	-
8/Growing Season Precip. (in.)		8.25	13.95	5.87	12.73	8.16	8.51										
9/ Soil PAW (in.) to SD at @plant		6.14	6.29	7.94	5.43	7.03	7.13										
Total Plant Avail. Water (in.)		14.39	20.24	13.81	18.16	15.19	15.64										
Soil NO3 (lbs.) to SD @Plant.		200.0	158.0	260.0	178.0	260											
SD (Sampling Depth in inches)		48.0	48.0	48.0	48.0	48.0											
Fertilizer Applied (#N)		50.0	55.0	56.0	55.0	0.0											
(#P2O5)		24.0	22.0	22.0	22.0	0.0											
(#K2O)		0.0	0.0	0.0	0.0	0.0											

Check variety is Fortuna.

1/ See MCES Bulletin 1093 for evaluation of other important variety performance characteristics to include protien, quality, disease resistance, etc., before making variety selection decisions.

2/ P = Private variety, + = Protected variety.

3/ Only the five most recent years shown, but summary calculations include all years noted.

4/ Crop suffered minor hail damage.

5/ 1992 nursery was lost due to poor stand establishment because of spring drought.

6/ 9-yr. CA = (x/y)* z where x = average yield or test weight of the entry for the years tested, y = average yield or test weight of Fortuna for the same years, and z = 9-yr. average of yield or test weight for the check variety Fortuna.

7/ Percent of Fortuna yield or test weight for the same data years as those in which the entry was tested.

8/ Seeding to 1a days prior to harvest maturity.

9/ Soil PAW values are actual gravimetric measurements.

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TABLE 9. DRYLAND FALLOW SPRING WHEAT VARIETY EVALUATION NURSERY GROWN OFF-STATION AT THE MARK & NANCY PETERSON FARM, NORTH HAVRE. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1996.

ID	VARIETY or SELECTION	STAND %	PLNT HT Inches	YIELD Bu/Ac	TEST WT Lbs/Bu	PROTEIN %
BZ684-23	VANNA (Soft White)	98.27	25.66	47.50	58.03	12.00
MT 9410	MT8808/MARBERG	97.90	32.34	46.53	61.73	13.60
MT 9433	MT8808/MARBERG	98.60	31.94	45.13	61.20	15.40
PNR 2375	PIONEER 2375	100.00	27.93	45.00	60.40	14.20
PI574642	MCNEAL	98.60	28.37	44.27	58.03	14.90
MT 9565	HI-LINE/PI372129//HI-LINE	100.00	30.51	44.07	60.97	14.30
WBEXPRES	WESTBRED EXPRESS	99.30	24.29	43.73	59.33	14.40
MT 9311	MT7819/(OLAF/LEW)	96.53	30.43	43.47	61.50	14.30
MTHW9420	MT8182/MT8289 (Hard White)	99.30	27.41	43.43	59.00	13.90
MTHW9503	MT8182/MT8289 (Hard White)	100.00	26.61	43.40	59.63	14.60
ND 606	AMIDON	100.00	32.80	42.67	60.03	14.20
WB 936	WESTBRED 936	95.50	25.98	41.20	59.03	14.60
PI483235	GLENMAN	100.00	29.07	41.20	58.47	13.90
WB 926	WESTBRED 926	98.97	26.97	40.77	59.67	14.50
ND 626	GRANDIN	96.87	29.30	40.60	59.33	14.50
CI 17430	NEWANA	98.60	25.38	39.83	59.53	14.00
C982-324	RAMBO	99.30	26.27	39.80	59.73	13.70
TR983239	FERGUS	100.00	25.71	38.50	60.23	14.80
ND 673	TRENTON	97.57	31.84	38.47	59.60	15.10
ND 582	STOA	100.00	30.55	38.13	58.83	14.90
CI 17429	LEW	98.97	31.59	37.97	61.00	14.50
CI 17790	LEN	98.63	27.23	37.43	58.97	15.20
PI549275	HI-LINE	100.00	26.25	37.33	58.83	15.00
ND 677	ERNEST	97.90	31.68	36.10	60.53	15.20
CI 13596	FORTUNA	98.60	32.66	34.57	60.70	14.70
EXPERIMENTAL MEANS		98.78	28.75	41.24	59.77	14.42
C.V. 2: (S OF MEAN/MEAN)*100		.95	2.30	5.24	.91	-
LSD (0.05)		2.68	1.88	6.15	1.55	-

CLIMATIC and NURSERY MANAGEMENT DATA

Exp #: 96-9953-SW Field: OffSta Design: __RCB__ # Ents: 25 # Reps: 3 Plot-Obsrv: 54 sqft. Hvst-Obsrv: 48 sqft.
Qtr: ___NENE___ Section: 32 Twnshp: 36 N Range: 13 E Latitude: 48.83 N Longitude: 110.03 W Elevation: 2800 ft.

Seeding Date: 05/10/96 Sd'g Depth: 1.25 in. Depth to Moisture @ Sd'g: 0.25 in. Moist Soil Depth @ Sd'g: 55.0+ in.
Soil Temp @ Sd'g: __._F @ 1 in. 52.0F @ 2 in. 48.0F @ 4 in. Soil Texture: SCL Soil Series: _____
Cropping System: _X_ Fallow ___ Recrop ___ Full-Till ___ Reduced-Till _X_ No-Till # Tillages: 0 # Chem Apps: 2
Cropping System Details: _____'Fallow Master' (32oz 5/23/95 + ammonium sulfate, 44oz 7/13/95 + ammonium sulfate)____
Cropping History: 1 Yr Ago = 95 = _Chem Fallow__ 2 Yrs Ago = 94 = _Winter Wheat_ 3 Yrs Ago = 93 = ____Fallow____
Fertilizer: 56#N,25#P2O5, 8#K2O/ac via BlueJet/coulter liquid inject. 08/20/95 Herbicide: _'Bronate' @ 1.5 pts/ac_
Harvest Date: 08/27/96 Root Penetration Depth: 41 in. Comments: __Pre-Plant Soil Analysis was Post-Fertilization__

Depth	PRE-PLANT SOIL ANAL 05/10/96 Max Depth=48"								__/__/__	POST-HVST SOIL ANAL 08/27/96 (Max Depth=48"							
	in. PAW	pH	% OM	Lb/a NO3	ppm P	ppm K	ppm S	Soil Text	CEC Txt	in. PAW	in. PAW	pH	% OM	Lb/a NO3	ppm P	ppm K	ppm S	Soil Text	CEC Txt
0 -6"	.78	7.8	1.3	10	14	220	7	VFSL+	14.5	_____	.15	7.7	1.2	4	14	260	8	SCL-	21.7
6-24"	2.65			42			16	VFSL+		_____	1.01			6			19	SCL	
24-36"	1.99			8				CL-		_____	.72			12				CL	
36-48"	2.05			24				CL-		_____	1.37			64				CL	
TOTAL:	7.47			84						_____	3.25			86					

Precipitation & Stored Soil Water Summary: 05/10/96 to Sd'g: 0.00 in. (0.00 in events =>.1 in.) Calc'd Initial Soil Water @ Sd'g: 7.47 in.
05/10/96 to Hvst: 4.50 in. (4.19 in events =>.1 in.) Measured Resid Soil Water @ Hvst: 3.25 in.
Growing Season (05/10/96 to 14 days prior to Harvest Maturity: 4.50 in.) (4.19 in events =>.1 in.)
Post-Grwg Seas (14 days prior to Harvest Maturity to 08/27/96: 0.00 in.) (0.00 in events =>.1 in.)
Adj'd Summary: Init GS H2O Inv + 'Init GS Inv to Hvst' Prec - Hvst Resid H2O - 'PostGS' Prec (Calc'd ET: 8.72 in.)

TABLE 10. TEN-YEAR YIELD AND TEST WEIGHT SUMMARY ON SELECTED ENTRIES FROM A FALLOW SPRING WHEAT VARIETY NURSERY GROWN OFF-STATION AT THE MARK AND NANCY PETERSON FARM, NORTH HAVRE. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1987-1996.

2/ VARIETY OR SELECTION	NO. OF YEARS TESTED 3/	1/ YIELD (BUSHELS PER ACRE) 1992 4/	1993	1994	1995	1996	AVERAGE FOR YEARS TESTED	10-YR. COMPAR. AVERAGE YIELD 5/	PERCENT OF FORTUNA YIELD 6/	TEST WEIGHT (POUNDS PER BUSHEL) 1992 4/	1993	1994	1995	1996	AVERAGE FOR YEARS TESTED	10-YR. COMPAR. AVERAGE TEST WT 5/	PERCENT OF FORTUNA TEST WT 6/
PI574642 McNEAL	4	-	51.9	41.3	53.1	44.3	47.6	39.3	124.9	-	55.7	56.0	57.9	58.0	56.9	56.7	97.6
CI 17904 OWENS(sft wht)	7	-	53.6	43.9	-	-	36.3	38.9	123.6	-	53.0	56.0	-	-	56.1	56.5	97.3
WA 6920 PENAWAWA(sftwh	5	-	56.0	41.8	-	-	37.3	36.4	115.6	-	54.5	56.1	-	-	55.6	56.0	96.4
PI483235 GLENMAN	9	-	41.3	34.8	46.5	41.2	35.9	35.9	113.9	-	54.4	55.8	55.9	58.5	56.0	56.0	96.3
CI 17430 NEWANA	9	-	46.2	41.3	49.8	39.8	35.6	35.6	113.0	-	54.7	57.9	57.0	59.5	57.5	57.5	99.0
ND 606 AMIDON	7	-	47.7	40.1	44.8	42.7	38.5	35.5	112.7	-	55.4	57.5	56.9	60.0	57.6	57.4	98.7
WPB 926R WSTBRD926 (P+)	6	-	42.8	36.6	43.4	40.8	38.5	34.0	108.0	-	54.2	57.2	55.3	59.7	56.3	56.1	96.5
CI 17920 MARSHALL	3	-	-	-	-	-	24.7	33.6	106.6	-	-	-	-	-	56.6	56.9	98.0
CI 17828 PONDERA	8	-	47.2	36.4	46.4	-	32.6	33.0	104.9	-	57.4	58.3	58.3	-	58.1	58.4	100.4
CI 17790 LEN	9	-	34.6	34.7	43.0	37.4	32.6	32.6	103.7	-	52.8	58.0	55.0	59.0	55.9	55.9	96.1
C982-324 RAMBO (P+)	9	-	46.5	31.9	40.8	39.8	32.6	32.6	103.4	-	56.9	58.4	56.7	59.7	58.2	58.2	100.2
PI549275 HI-LINE	8	-	42.4	36.2	45.2	37.3	31.8	32.3	102.6	-	55.1	56.4	56.3	58.8	56.2	56.2	96.7
CI 17429 LEW	9	-	40.6	33.9	45.0	38.0	32.1	32.1	101.9	-	56.8	57.6	59.0	61.0	58.2	58.2	100.0
ND 677 ERNEST	3	-	-	34.8	47.8	36.1	39.6	31.9	101.5	-	-	58.4	57.4	60.5	58.8	57.4	98.8
ND 626 GRANDIN	6	-	43.0	38.2	43.6	40.6	35.7	31.6	100.2	-	56.4	56.4	56.3	59.3	56.4	56.2	96.7
CI 13596 FORTUNA	9	-	35.5	39.5	43.0	34.6	31.5	31.5	100.0	-	54.8	58.8	58.9	60.7	58.1	58.1	100.0
NDCUT CUTLESS	7	-	34.5	35.6	-	-	28.5	30.6	97.1	-	53.6	57.4	-	-	56.8	57.3	98.6
CANLANC LANCER	6	-	37.1	33.4	-	-	27.5	30.4	96.6	-	55.2	58.1	-	-	57.4	58.0	99.8
ND 582 STOA	9	-	33.4	36.5	40.9	38.1	30.1	30.1	95.6	-	54.4	57.0	55.9	58.8	56.5	56.5	97.2
ND 618 GUS	3	-	35.4	-	-	-	30.7	30.0	95.2	-	55.4	-	-	-	56.2	57.2	98.4
CI 17910 ALEX	4	-	-	-	-	-	23.6	29.9	94.8	-	-	-	-	-	58.9	58.4	100.4
CI 15930 OLAF	6	-	34.4	-	-	-	26.2	29.7	94.5	-	55.1	-	-	-	56.1	56.7	97.5
WPB 906R WSTBRD906R (P+	3	-	-	-	-	-	19.1	25.9	82.4	-	-	-	-	-	56.9	57.3	98.5
MEAN (ENTRIES LISTED)		-	42.3	37.3	45.2	39.3	-	32.8	-	-	55.0	57.3	56.9	59.5	-	57.1	-
8/ Growing Season Precip. (in.)		5.09	13.03	4.00	11.26	4.50	6.39										
9/ Soil PAW (in.) to SD @Pltng		5.67	6.75	7.93	4.96	5.13	6.49										
Total Plant Avail. Water (in.)		10.76	19.78	11.93	16.22	9.63	12.88										
Soil NO3 (lbs.) to SD @Pltng		198.0	162.0	110.0	104.0	84.0											
SD (Sampling Depth in inches)		48.0	48.0	48.0	48.0	48.0											
Fertilizer Applied (# N)		42.0	70.5	40.0	30.0	0.0											
(# P2O5)		25.0	25.0	30.0	15.0	0.0											
(# K2O)		10.0	10.0	0.0	7.0	0.0											
(# SO4)		0.0	0.0	0.0	0.0	0.0											

Check variety is Fortuna.

1/ See MCES Bulletin 1093 for evaluation of other important variety performance characteristics to include protein, quality, disease resistance, etc. before making variety selection decisions.

2/ P = Private variety, + = Protected variety.

3/ Only the most recent five years are shown, but summary calculations include all the years noted. The 1991 crop suffered substantial hail damage.

4/ 1992 nursery was not harvested due to extensive hail damage.

5/ 10-yr. CA = (x/y) * z where x = average yield or test weight of the entry for years tested, y = average yield or test weight for Fortuna for the same years, and z = 10-yr. average yield or test weight for the check variety Fortuna.

6/ Percent of Fortuna yield or test weight for the same data years as those in which the entry was tested.

8/ Seeding to 14 days prior to harvest maturity.

9/ Soil PAW values are actual gravimetric measurements.

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TABLE 11. DRYLAND FALLOW SPRING WHEAT VARIETY EVALUATION NURSERY GROWN OFF-STATION AT GRAFF FARMS, INC., NORTH JOPLIN. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1996.

ID	VARIETY or SELECTION	STAND %	PLNT HT Inches	YIELD Bu/Ac	TEST WT Lbs/Bu	PROTEIN %
MTHW9503	MT8182/MT8289 (Hard White)	99.30	27.02	51.40	56.87	14.60
TR983239	FERGUS	99.67	27.85	50.27	57.30	15.70
PI549275	HI-LINE	99.30	27.97	50.27	55.93	15.50
ND 606	AMIDON	99.30	36.38	50.00	59.17	14.70
WB 926	WESTBRED 926	100.00	27.07	48.07	56.67	16.00
PI574642	MCNEAL	98.27	29.06	47.60	56.47	16.10
CI 17430	NEWANA	97.57	27.89	47.00	56.83	15.60
BZ684-23	VANNA (Soft White)	98.60	27.49	46.97	54.20	14.40
WBEXPRES	WESTBRED EXPRESS	95.83	26.18	46.63	57.07	15.10
ND 626	GRANDIN	99.30	30.76	46.63	56.43	15.60
WB 936	WESTBRED 936	95.47	26.26	46.60	55.10	15.80
ND 582	STOA	99.67	35.20	46.60	55.83	16.00
PI483235	GLENMAN	98.30	30.16	46.40	56.80	14.60
MT 9565	HI-LINE/PI372129//HI-LINE	99.67	35.31	46.20	58.33	15.60
PNR 2375	PIONEER 2375	100.00	32.22	45.03	57.40	15.30
CI 17790	LEN	97.90	28.57	44.77	56.73	15.80
ND 677	ERNEST	100.00	33.50	44.63	59.30	16.00
MT 9433	MT8808/MARBERG	99.30	33.43	44.57	58.53	16.40
C982-324	RAMBO	99.67	27.14	44.27	57.97	15.40
CI 13596	FORTUNA	97.60	36.06	43.90	60.27	14.90
MT 9410	MT8808/MARBERG	100.00	33.23	43.53	59.00	15.00
ND 673	TRENTON	100.00	36.82	43.33	57.53	15.80
MTHW9420	MT8182/MT8289 (Hard White)	99.30	26.27	41.80	55.20	15.20
CI 17429	LEW	98.97	36.97	41.77	58.20	15.60
MT 9311	MT7819/(OLAF/LEW)	96.87	32.31	40.27	58.10	15.70
EXPERIMENTAL MEANS		98.79	30.84	45.94	57.25	15.46
C.V. 2: (S OF MEAN/MEAN)*100		.86	2.57	5.12	.88	-
LSD (0.05)		2.41	2.25	6.69	1.44	-

CLIMATIC and NURSERY MANAGEMENT DATA

Exp #: 96-9954-SW Field: OffSta Design: __RCB__ # Ents: 25 # Reps: 3 Plot-Obsrv: 54 sqft. Hvst-Obsrv: 48 sqft.
Qtr: ____SE____ Section: 8 Twnshp: 34 N Range: 7 E Latitude: 48.73 N Longitude: 110.83 W Elevation: 3300 ft.

Seeding Date: 05/09/96 Sd'g Depth: 1.50 in. Depth to Moisture @ Sd'g: 0.50 in. Moist Soil Depth @ Sd'g: 55.0+ in.
Soil Temp @ Sd'g: ___. F @ 1 in. 43.0F @ 2 in. 42.0F @ 4 in. Soil Texture: CL Soil Series: Joplin-Hillon Cl Loam
Cropping System: _X_ Fallow ___ Recrop ___ Full-Till _X_ Reduced-Till ___ No-Till # Tillages: 2 # Chem Apps: 1
Cropping System Details: 95 Fallow Season = 1x Chem treatment w/10oz 'Roundup' early, + 2 tillage opn's summer 95.__
Cropping History: 1 Yr Ago = 95 = ____Fallow____ 2 Yrs Ago = 94 = _Spring Wheat_ 3 Yrs Ago = 93 = ____Fallow____
Fertilizer:114#N,29#P2O5,0#K2O/ac via NH3(55#)fall95 +59-29-0 via gran.blend bnd'd at plntg_ Herbicide: None-App'd
Harvest Date: 08/28/96 Root Penetration Depth: 45 in. Comments: Pre-Plnt Soil Anal=Post-Fall Fert, & Pre-Spr Fert_

Depth	PRE-PLANT SOIL ANAL 05/09/96 Max Depth=48"									__/__/__	POST-HVST SOIL ANAL 08/28/96 (Max Depth=48"							
	in. PAW	pH	% OM	Lb/a NO3	ppm P	ppm K	ppm S	Soil Text	CEC Txt	in. PAW	in. PAW	pH	% OM	Lb/a NO3	ppm P	ppm K	ppm S	Soil Text	CEC Txt
0 -6"	1.21	7.7	1.7	40	13	274	13	CL	21.8	_____	.31	7.7	1.5	4	9	272	9	CL	21.8
6-24"	4.15			54			22	CL		_____	1.18			6			20	CL	
24-36"	2.59			52				CL-		_____	.70			4				SCL	
36-48"	2.28			48				CL-		_____	1.80			24				CL	
TOTAL:	10.23			194						_____	3.99			38					

Precipitation & Stored Soil Water Summary: 05/09/96 to Sd'g: 0.00 in. (0.00 in events =>.1 in.) Calc'd Initial Soil Water @ Sd'g: 10.23 in.
05/09/96 to Hvst: 4.94 in. (N/A in events =>.1 in.) Measured Resid Soil Water @ Hvst: 3.99 in.
Growing Season (05/09/96 to 14 days prior to Harvest Maturity: 4.93 in.) (N/A in events =>.1 in.)
Post-Grwg Seas (14 days prior to Harvest Maturity to 08/28/96: 0.01 in.) (0.00 in events =>.1 in.)
Adj'd Summary: Init GS H2O Inv + 'Init GS Inv to Hvst' Prec - Hvst Resid H2O - 'PostGS' Prec (Calc'd ET: 11.18 in.)

TABLE 12. EIGHT-YEAR YIELD AND TEST WEIGHT SUMMARY ON SELECTED ENTRIES FROM A FALLOW SPRING WHEAT NURSERY GROWN OFF-STATION AT GRAFF FARMS, INC., JOPLIN. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1989-1996.

2/ VARIETY OR SELECTION	NO. OF YEARS TESTED 3/	1/ YIELD (BUSHELS PER ACRE) 1992	1993	1994	1995	1996	AVERAGE FOR YEARS TESTED	8-YR COMPAR. AVERAGE YIELD 4/	PERCENT OF FORTUNA YIELD 5/	TEST WEIGHT (POUNDS PER BUSHEL) 1992	1993	1994	1995	1996	AVERAGE FOR YEARS TESTED	8-YR COMPAR. AVERAGE TEST WT 4/	PERCENT OF FORTUNA TEST WT 5/
WA 6920 PENAWAWA (sft wht)	6	48.4	76.4	36.9	-	-	52.6	55.3	131.6	59.4	60.8	56.8	-	-	58.8	59.3	97.8
CI 17904 OWENS (sft wht)	6	52.6	79.6	32.1	-	-	50.9	53.6	127.5	59.4	61.1	58.4	-	-	59.0	59.6	98.1
PI574642 McNEAL	5	39.5	67.6	33.8	73.7	47.6	52.3	51.0	121.4	60.6	61.3	56.5	61.4	56.5	59.3	59.4	97.9
PI483235 GLENMAN	8	36.2	74.9	31.9	65.8	46.4	49.8	49.8	118.4	58.6	61.0	56.2	60.8	56.8	59.1	59.1	97.3
ND 606 AMIDON	8	38.9	66.8	31.2	66.9	50.0	49.6	49.6	118.1	58.3	60.4	58.1	61.3	59.2	59.6	59.6	98.3
CI 17828 PONDERA	7	36.5	67.4	34.0	62.0	-	48.7	49.0	116.6	60.1	61.9	59.2	61.6	-	60.5	60.4	99.5
CI 17430 NEWANA	8	37.3	63.8	30.7	68.8	47.0	48.8	48.8	116.2	59.1	61.2	59.3	61.8	56.8	60.0	60.0	98.8
PI549725 HI-LINE	8	27.8	66.2	32.1	71.9	50.3	47.6	47.6	113.4	60.6	62.0	57.1	62.0	55.9	59.0	59.0	97.1
ND 626 GRANDIN	7	43.3	63.5	31.0	56.8	46.6	47.2	46.7	111.1	60.7	62.3	58.8	61.8	56.4	59.6	59.7	98.3
PI486139 KLASIC(P+)(hrd wht	3	30.3	66.1	34.4	-	-	43.6	46.3	110.2	60.0	59.6	57.3	-	-	59.0	60.3	99.4
ND 618 GUS	4	31.8	61.2	-	-	-	45.5	45.9	109.2	59.1	61.7	-	-	-	60.1	60.7	100.0
C982-324 RAMBO (P+)	8	32.7	65.8	25.3	63.1	44.3	45.9	45.9	109.1	59.9	61.1	59.1	62.3	58.0	60.5	60.5	99.6
ND 582 STOA	8	40.6	51.9	32.6	60.1	46.6	45.6	45.6	108.4	59.2	60.7	57.7	60.9	55.8	59.1	59.1	97.3
CI 17790 LEN	8	29.5	55.5	30.6	62.1	44.8	45.4	45.4	108.1	59.6	61.2	58.7	61.5	56.7	59.4	59.4	97.8
WPB 926R WESTBRED 926 (P+)	7	25.4	59.3	29.6	61.6	48.1	45.6	45.1	107.3	59.6	59.9	58.6	60.7	56.7	58.7	58.7	96.7
ND 677 ERNEST	3	-	-	34.4	57.7	44.6	45.6	43.9	104.5	-	-	59.6	60.9	59.3	59.9	59.2	97.6
CI 17429 LEW	8	34.0	64.7	30.8	54.6	41.8	43.9	43.9	104.4	59.8	62.4	58.8	62.0	58.2	60.4	60.4	99.4
NDCUT CUTLESS	6	34.7	55.8	30.7	-	-	40.6	42.7	101.6	59.0	60.2	58.6	-	-	59.8	60.3	99.4
CI 15930 OLAF	5	22.6	50.6	-	-	-	41.7	42.6	101.4	59.0	60.4	-	-	-	59.1	59.5	98.1
CI 13596 FORTUNA	8	25.7	58.6	34.3	52.6	43.9	42.0	42.0	100.0	57.5	61.0	59.6	64.4	60.3	60.7	60.7	100.0
CANLANC LANCER	6	29.9	54.8	28.2	-	-	38.6	40.6	96.7	59.0	61.1	58.1	-	-	59.8	60.3	99.4
MEANS (ENTRIES LISTED)		34.9	63.5	31.8	62.7	46.3	-	46.7	-	59.4	61.1	58.2	61.7	57.4	-	59.8	-
6/Growing Season Precip. (in.)		9.23	12.45	2.83	12.88	NA	8.57										
7/ Soil PAW (in.) to SD at @plnt'g		6.64	5.76	9.31	5.61	6.94	7.87										
Total Plant Avail. Water (in.)		15.87	18.21	12.14	18.49	6.94	16.44										
Soil NO3 (lbs.) to SD @Planting		96.0	112.0	108.0	62.0	194.0											
SD (Sampling Depth in inches)		48.0	48.0	48.0	48.0	48.0											
Fertilizer Applied (# N)		70.0	55.0	90.0	38.0	114.0											
(# P2O5)		40.0	0.0	0.0	19.0	29.0											
(# K2O)		0.0	0.0	0.0	7.0	0.0											

Check variety is Fortuna.

1/ See MCES Bulletin 1093 for evaluation of other important variety performance characteristics to include protien, quality, disease resistance,etc., before making variety selection decisions.

2/ P = Private variety, + = Protected variety.

3/ Only five years shown, but summary calculations include all years noted.

4/ 8-yr. CA = (x/y)* z where x = average yield or test weight of the entry for the years tested, y = average yield or test weight of Fortuna for the same years, and z = 8-yr. average of yield or test weight for the check variety Fortuna.

5/ Percent of Fortuna yield or test weight for the same data years as those in which the entry was tested.

6/ Seeding to 14 days prior to harvest maturity.

7/ Soil PAW values are actual gravimetric measurements.

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TABLE 13. DRYLAND FALLOW SPRING WHEAT VARIETY EVALUATION NURSERY GROWN OFF-STATION AT FLANSAAS/LUMSDEN FARMS, LORING. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1996.

ID	VARIETY or SELECTION	STAND %	PLNT HT Inches	YIELD Bu/Ac	TEST WT Lbs/Bu	PROTEIN %
BZ684-23	VANNA (Soft White)	92.03	19.68	30.80	59.30	12.40
CI 17430	NEWANA	87.50	19.79	30.23	61.63	13.70
ND 606	AMIDON	94.43	22.90	29.27	61.03	14.50
MT 9565	HI-LINE/PI372129//HI-LINE	93.73	21.01	28.87	60.80	14.30
PI483235	GLENMAN	95.80	21.63	28.80	58.73	13.50
MT 9433	MT8808/MARBERG	88.20	21.72	28.67	61.83	15.50
PI574642	MCNEAL	93.07	19.76	28.60	59.90	14.90
MT 9311	MT7819/(OLAF/LEW)	83.67	20.73	28.40	61.80	13.90
PI549275	HI-LINE	92.37	19.70	28.27	60.50	15.20
MT 9410	MT8808/MARBERG	89.60	21.99	27.97	61.67	14.30
PNR 2375	PIONEER 2375	95.50	19.21	27.83	60.97	14.90
WBEXPRES	WESTBRED EXPRESS	95.13	18.65	27.80	60.30	15.40
CI 17429	LEW	92.03	22.43	27.13	61.33	14.30
ND 677	ERNEST	93.40	20.93	27.13	61.47	15.30
MTHW9420	MT8182/MT8289 (Hard White)	92.37	17.41	27.03	61.13	14.50
WB 936	WESTBRED 936	96.87	20.41	26.93	60.50	14.80
CI 17790	LEN	91.33	21.71	26.90	61.23	14.60
ND 626	GRANDIN	93.07	22.98	26.87	61.43	15.00
C982-324	RAMBO	94.43	19.80	26.57	61.57	14.10
ND 582	STOA	95.83	23.44	26.57	59.87	14.90
MTHW9503	MT8182/MT8289 (Hard White)	90.27	19.03	26.57	60.00	15.60
ND 673	TRENTON	91.63	21.50	25.90	60.67	15.00
WB 926	WESTBRED 926	93.07	20.14	25.70	60.97	16.10
TR983239	FERGUS	92.00	19.29	25.50	61.97	15.40
CI 13596	FORTUNA	88.57	22.05	23.00	61.17	15.70
EXPERIMENTAL MEANS		92.24	20.72	27.49	60.87	14.71
C.V. 2: (S OF MEAN/MEAN)*100		3.02	3.29	3.15	.37	-
LSD (0.05)		7.93	1.94	2.46	.65	-

CLIMATIC and NURSERY MANAGEMENT DATA

Exp #: 96-9955-SB Field: OffSta Design: __RCB__ # Ents: 25 # Reps: 3 Plot-Obsrv: 54 sqft. Hvst-Obsrv: 48 sqft.
Qtr: _____ Section: 24 Twnshp: 35 N Range: 29 E Latitude: 48.78 N Longitude: 107.88 W Elevation: 2700 ft.

Seeding Date: 05/11/96 Sd'g Depth: 1.25 in. Depth to Moisture @ Sd'g: 0.50 in. Moist Soil Depth @ Sd'g: 55.0+ in.
Soil Temp @ Sd'g: __._F @ 1 in. 54.0F @ 2 in. 48.0F @ 4 in. Soil Texture: SCL Soil Series: _____
Cropping System: _X_ Fallow ___ Recrop _X_ Full-Till ___ Reduced-Till ___ No-Till # Tillages: 4 # Chem Apps: 0
Cropping System Details: __1995 Fallow Season = 2x Tillage w/Sweeps, 2x Tillage w/Sweeps & Rods_____
Cropping History: 1 Yr Ago = 95 = ____Fallow____ 2 Yrs Ago = 94 = _SPRING WHEAT_ 3 Yrs Ago = 93 = ____Fallow____
Fertilizer: 57#N,28#P2O5, 0#K2O/ac via gran.blend bnd'd 1.5" below seed Herbicide: ___2,4-D+'Ally' @ N/A+.1oz/ac___
Harvest Date: 08/29/96 Root Penetration Depth: 40 in. Comments: __Pre-Plant Soil Analysis was Pre-Fertilization___

Depth	PRE-PLANT SOIL ANAL 04/22/96 Max Depth=48"								__/__/__	POST-HVST SOIL ANAL 08/29/96 (Max Depth=48"							
	in. PAW	pH	% OM	Lb/a NO3	ppm P	ppm K	ppm S	Soil Text	CEC Txt	in. PAW	in. PAW	pH	% OM	Lb/a NO3	ppm P	ppm K	ppm S	Soil Text	CEC Txt
0 -6"	.81	6.1	1.3	10	18	362	8	SCL-	21.7	_____	.17	6.4	1.2	6	19	290	7	SCL-	21.7
6-24"	3.10			18			14	SCL		_____	1.51			6			17	CL	
24-36"	1.60			4				SCL		_____	1.15			4				CL	
36-48"	1.18			8				CL		_____	1.67			8				CL	
TOTAL:	6.69			40						_____	4.50			24					

Precipitation & Stored Soil Water Summary: 04/22/96 to Sd'g: 0.30 in. (0.27 in events =>.1 in.) Calc'd Initial Soil Water @ Sd'g: 6.99 in.
05/11/96 to Hvst: 3.22 in. (2.73 in events =>.1 in.) Measured Resid Soil Water @ Hvst: 4.50 in.
Growing Season (05/11/96 to 14 days prior to Harvest Maturity: 3.19 in.) (2.73 in events =>.1 in.)
Post-Grwg Seas (14 days prior to Harvest Maturity to 08/29/96: 0.03 in.) (0.00 in events =>.1 in.)
Adj'd Summary: Init GS H2O Inv + 'Init GS Inv to Hvst' Prec - Hvst Resid H2O - 'PostGS' Prec (Calc'd ET: 5.71 in.)

TABLE 14. ONE-YEAR YIELD AND TEST WEIGHT SUMMARY ON SELECTED ENTRIES FROM A DRYLAND FALLOW SPRING WHEAT NURSERY GROWN OFF-STATION AT THE FLANSAAS/LUMSDEN FARM, LORING. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1996.

2/ VARIETY OR SELECTION	NO. OF YEARS TESTED	1/ YIELD (BUSHELS PER ACRE) 1996	1997	1998	1999	2000	AVERAGE FOR YEARS TESTED	1-YR. COMPAR. AVERAGE YIELD 3/	PERCENT OF FORTUNA YIELD 4/	TEST WEIGHT (POUNDS PER BUSHEL) 1996	1997	1998	1999	2000	AVERAGE FOR YEARS TESTED	1-YR. COMPAR. AVERAGE TEST WT 3/	PERCENT OF FORTUNA TEST WT 4/
BZ684-23 VANNA (sft whi	1	30.8	-	-	-	-	30.8	30.8	133.9	59.3	-	-	-	-	59.3	59.3	96.9
CI 17430 NEWANA	1	30.2	-	-	-	-	30.2	30.2	131.4	61.6	-	-	-	-	61.6	61.6	100.8
ND 606 AMIDON	1	29.3	-	-	-	-	29.3	29.3	127.3	61.0	-	-	-	-	61.0	61.0	99.8
MT 9565 HI-LINE/PI3721	1	28.9	-	-	-	-	28.9	28.9	125.5	60.8	-	-	-	-	60.8	60.8	99.4
PI483235 GLENMAN	1	28.8	-	-	-	-	28.8	28.8	125.2	58.7	-	-	-	-	58.7	58.7	96.0
MT 9433 MT8808/MARBERG	1	28.7	-	-	-	-	28.7	28.7	124.7	61.8	-	-	-	-	61.8	61.8	101.1
PI574642 McNEAL	1	28.6	-	-	-	-	28.6	28.6	124.3	59.9	-	-	-	-	59.9	59.9	97.9
MT 9311 MT7819/(OLAF/L	1	28.4	-	-	-	-	28.4	28.4	123.5	61.8	-	-	-	-	61.8	61.8	101.0
PI549275 HI-LINE	1	28.3	-	-	-	-	28.3	28.3	122.9	60.5	-	-	-	-	60.5	60.5	98.9
MT 9410 MT8808/MARBERG	1	28.0	-	-	-	-	28.0	28.0	121.6	61.7	-	-	-	-	61.7	61.7	100.8
PNR 2375 PIONEER 2375	1	27.8	-	-	-	-	27.8	27.8	121.0	61.0	-	-	-	-	61.0	61.0	99.7
WBEXPRES WSTBRD EXPRESS	1	27.8	-	-	-	-	27.8	27.8	120.9	60.3	-	-	-	-	60.3	60.3	98.6
ND 677 ERNEST	1	27.1	-	-	-	-	27.1	27.1	118.0	61.5	-	-	-	-	61.5	61.5	100.5
CI 17429 LEW	1	27.1	-	-	-	-	27.1	27.1	118.0	61.3	-	-	-	-	61.3	61.3	100.3
MTHW9420 MT8182/MT8289	1	27.0	-	-	-	-	27.0	27.0	117.5	61.1	-	-	-	-	61.1	61.1	99.9
WB 936 WESTBRED 936	1	26.9	-	-	-	-	26.9	26.9	117.1	60.5	-	-	-	-	60.5	60.5	98.9
CI 17790 LEN	1	26.9	-	-	-	-	26.9	26.9	117.0	61.2	-	-	-	-	61.2	61.2	100.1
ND 626 GRANDIN	1	26.9	-	-	-	-	26.9	26.9	116.8	61.4	-	-	-	-	61.4	61.4	100.4
ND 582 STOA	1	26.6	-	-	-	-	26.6	26.6	115.5	59.9	-	-	-	-	59.9	59.9	97.9
MTHW9503 MT8182/MT8289	1	26.6	-	-	-	-	26.6	26.6	115.5	60.0	-	-	-	-	60.0	60.0	98.1
C982-324 RAMBO (P+)	1	26.6	-	-	-	-	26.6	26.6	115.5	61.6	-	-	-	-	61.6	61.6	100.7
ND 673 TRENTON	1	25.9	-	-	-	-	25.9	25.9	112.6	60.7	-	-	-	-	60.7	60.7	99.2
WPB 926R WSTBRD926R (P+	1	25.7	-	-	-	-	25.7	25.7	111.7	61.0	-	-	-	-	61.0	61.0	99.7
TR983239 FERGUS (P+)	1	25.5	-	-	-	-	25.5	25.5	110.9	62.0	-	-	-	-	62.0	62.0	101.3
CI 13596 FORTUNA	1	23.0	-	-	-	-	23.0	23.0	100.0	61.2	-	-	-	-	61.2	61.2	100.0
MEAN (ENTRIES LISTED)		27.5	-	-	-	-	-	27.5	-	60.9	-	-	-	-	-	60.9	-
5/ Growing Season Precip. (in.)		3.19					3.19										
6/ Soil PAW (in.) to SD @Plntng.		5.26					5.26										
Total Plant Avail. Water (in.)		8.45					8.45										
Soil NO3 (lbs.) to SD @Plntng.		40.0															
SD (Sampling Depth in inches)		48.0															
Fertilizer Applied (# N)		57.0															
(# P2O5)		28.0															

Check variety is Fortuna.

1/ See MCES Bulletin 1093 for evaluation of other important variety performance characteristics to include protein, quality, disease resistance, etc. before making variety selection decisions.

2/ P = Private variety, + = Protected variety.

3/ 1-yr. CA = (x/y) * z where x = average yield or test weight of the entry for years tested, y = average yield or test weight for Fortuna for the same years, and z = 1-yr. average yield or test weight for the check variety Fortuna.

4/ Percent of Fortuna yield or test weight for the same data years as those in which the entry was tested.

5/ Seeding to 14 days prior to harvest maturity.

6/ Soil PAW values are actual gravimetric measurements.

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GRC
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TABLE 15. FERTILIZED DRYLAND FALLOW BARLEY VARIETY EVALUATION NURSERY GROWN OFF-STATION AT THE LEON CEDERBERG FARM, TURNER. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1996.

ID	VARIETY or SELECTION	STAND %	PLNT HT Inches	YIELD Bu/Ac	TEST WT Lbs/Bu	PLUMP %	THIN %	PROTEIN %
PI483237	Bowman	80.93	19.61	49.43	49.97	96.03	.73	12.93
CI 15514	Hector	81.60	20.67	43.77	47.93	82.80	4.93	13.13
PI568246	Baronesse	90.60	16.71	43.43	48.93	92.17	1.40	14.77
H1851195	H1851195	87.17	17.15	42.63	47.77	90.20	2.07	14.57
CI 15229	Steptoe	90.63	16.82	42.47	42.07	83.77	5.20	11.40
MN 56	Stander	61.13	18.90	41.63	45.87	88.73	2.60	12.67
PI537438	Targhee	86.80	18.56	41.17	47.53	86.97	4.13	13.60
CI 15856	Lewis	87.87	17.98	40.90	49.07	84.63	4.70	14.03
ND 9866	Stark	89.23	18.83	39.33	49.67	96.63	.93	12.97
PI591823	Chinook	92.37	16.43	38.97	47.80	74.83	6.80	14.07
N1123111	Logan	88.53	19.00	38.93	48.47	87.97	2.70	13.20
H3860224	H3860224	88.53	18.37	38.67	47.70	89.47	3.13	14.13
PI491534	Gallatin	90.27	19.36	36.47	48.40	81.10	5.40	12.73
CI 9558	Piroline	95.13	19.45	34.47	48.00	69.07	7.73	14.40
MT886610	MT886610	94.10	18.90	33.90	48.67	81.80	6.07	13.67
SK 76333	Harrington	89.23	17.52	32.10	47.20	85.43	4.17	14.13
EXPERIMENTAL MEANS		87.13	18.39	39.89	47.81	85.73	3.92	13.52
C.V. 2: (S OF MEAN/MEAN)*100		6.46	4.82	7.88	.83	1.54	14.97	1.40
LSD (0.05)		16.27	2.56	9.08	1.15	3.81	1.69	.55

CLIMATIC and NURSERY MANAGEMENT DATA

Exp #: 96-3651-SB Field: OffSta Design: __RCB__ # Ents: 16 # Reps: 3 Plot-Obsrv: 54 sqft. Hvst-Obsrv: 48 sqft.
Qtr: ____SE____ Section: 13 Twnshp: 36 N Range: 25 E Latitude: 48.88 N Longitude: 108.39 W Elevation: 2900 ft.

Seeding Date: 05/13/96 Sd'g Depth: 1.50 in. Depth to Moisture @ Sd'g: 0.50 in. Moist Soil Depth @ Sd'g: 55.0+ in.
Soil Temp @ Sd'g: __.__F @ 1 in. 59.0F @ 2 in. 56.0F @ 4 in. Soil Texture: SCL Soil Series: _____
Cropping System: _X_ Fallow ___ Recrop _X_ Full-Till ___ Reduced-Till ___ No-Till # Tillages: 4 # Chem Apps: 0
Cropping System Details: __1995 Fallow Season = 3x Tillage w/Sweeps & Harrows, 1x Tillage w/Sweeps, Rods & Harrows__
Cropping History: 1 Yr Ago = 95 = ____Fallow____ 2 Yrs Ago = 94 = _____Durum____ 3 Yrs Ago = 93 = ____Fallow___
Fertilizer: 71#N,35#P2O5, 0#K2O/ac via gran.blend bnd'd 1.5" below seed_ Herbicide: _'BanvelSGF'+LV6 @4.26+6.4oz/ac_
Harvest Date: 09/04/96 Root Penetration Depth: 40 in. Comments: __Pre-Plant Soil Analysis was Pre-Fertilization___

Depth	PRE-PLANT SOIL ANAL 05/13/96 Max Depth=48"									__/__/__	POST-HVST SOIL ANAL 10/18/96 (Max Depth=48"							
	in. PAW	pH	% OM	Lb/a NO3	ppm P	ppm K	ppm S	Soil Text	CEC Txt	in. PAW	in. PAW	pH	% OM	Lb/a NO3	ppm P	ppm K	ppm S	Soil Text	CEC Txt
0 -6"	.83	5.7	2.0	20	25	341	5	SCL-	21.7	_____	.88	6.1	1.4	10	35	330	11	SCL	21.7
6-24"	3.12			18			13	CL-		_____	2.48			30			14	SCL	
24-36"	2.05			12				CL		_____	.70			12				SCL-	
36-48"	1.81			4				CL		_____	1.05			24				SCL	
TOTAL:	7.81			54						_____	5.11			76					

Precipitation & Stored Soil Water Summary: 05/13/96 to Sd'g: 0.00 in. (0.00 in events =>.1 in.) Calc'd Initial Soil Water @ Sd'g: 7.81 in.
05/13/95 to Hvst: 3.62 in. (2.89 in events =>.1 in.) Measured Resid Soil Water @ Hvst: 3.24 in.
Growing Season (05/13/96 to 14 days prior to Harvest Maturity: 3.62 in.) (2.89 in events =>.1 in.)
Post-Grwg Seas (14 days prior to Harvest Maturity to 10/18/96: 2.63 in.) (2.40 in events =>.1 in.)
Adj'd Summary: Init GS H2O Inv + 'Init GS Inv to Smpl' Prec - Smpl Resid H2O - 'PostGS' Prec (Calc'd ET: 8.95 in.)

TABLE 16. TEN-YEAR YIELD AND TEST WEIGHT SUMMARY ON SELECTED ENTRIES FROM A FALLOW SPRING BARLEY VARIETY NURSERY GROWN OFF-STATION ON A 'TELSTAD' SOIL AT THE LEON CEDERBERG FARM, TURNER. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1987-1996.

		1/ YIELD (BUSHELS PER ACRE)								TEST WEIGHT (POUNDS PER BUSHEL)							
2/ VARIETY OR SELECTION	NO. OF YEARS TESTED 3/	1992	1993	1994	1995	1996	AVERAGE FOR YEARS TESTED	10-YR. COMPAR. AVERAGE YIELD 4/	PERCENT OF PIROLINE YIELD 5/	1992	1993	1994	1995	1996	AVERAGE FOR YEARS TESTED	10-YR. COMPAR. AVERAGE TEST WT 4/	PERCENT OF PIROLINE TEST WT 5/
NS 78054 BARONESSE (P+)	6	82.1	93.3	55.2	71.7	43.4	62.7	56.1	121.2	48.8	48.4	47.0	49.1	48.9	48.1	48.3	97.4
CI 15229 STEPTOE	10	71.2	88.7	65.6	68.3	42.5	54.7	54.7	118.1	43.7	41.6	42.0	42.5	42.1	43.0	43.0	86.8
ND 9866 STARK	7	63.2	80.9	58.2	57.8	39.3	55.2	52.8	114.0	50.7	49.2	50.2	51.6	49.7	50.0	50.4	101.6
PI531228 BEARPAW	7	59.5	77.8	-	-	-	49.8	51.7	111.6	47.0	49.5	-	-	-	48.1	48.2	97.1
PI483237 BOWMAN	10	64.3	75.9	53.8	54.1	49.4	51.2	51.2	110.5	50.6	48.8	48.8	50.7	50.0	50.0	50.0	100.9
MT851195 MT851195	4	-	81.5	57.7	59.1	42.6	60.2	50.6	109.4	-	48.1	47.1	49.4	47.8	48.1	48.1	97.1
MT 81161 MT 81161	5	60.3	78.0	-	-	-	54.5	50.3	108.6	46.3	47.4	-	-	-	48.7	48.1	96.9
MT860756 GALLATIN/BELLO	3	66.2	83.6	51.4	-	-	67.1	50.2	108.5	48.7	49.9	47.5	-	-	48.7	48.1	97.1
MT890008 MT890008	3	-	84.8	56.6	59.5	-	67.0	50.1	108.1	-	48.1	45.8	46.5	-	46.8	46.4	93.5
CI 15857 CLARK	7	58.3	69.0	-	-	-	47.9	49.7	107.4	47.5	48.8	-	-	-	48.2	48.2	97.2
PI591823 CHINOOK	9	66.9	69.0	56.0	52.5	39.0	50.7	49.4	106.7	48.7	48.4	46.7	48.7	47.8	48.3	48.3	97.5
PI491534 GALLATIN	10	69.7	69.2	54.1	50.7	36.5	49.4	49.4	106.6	49.6	49.0	47.8	49.7	48.4	49.4	49.4	99.7
H3860224 LEWIS/APEX	3	-	-	50.8	69.3	38.7	52.9	48.8	105.4	-	-	45.1	48.7	47.7	47.2	47.1	95.0
CI 15514 HECTOR	10	66.6	72.4	50.6	47.5	43.8	48.8	48.8	105.4	48.8	48.9	46.7	48.2	47.9	48.8	48.8	98.4
CI 15856 LEWIS	10	64.6	53.9	51.6	55.9	40.9	48.7	48.7	105.1	49.2	50.2	47.6	49.5	49.1	49.6	49.6	100.0
SK 76333 HARRINGTON	10	66.3	83.8	48.7	58.2	32.1	46.4	46.4	100.2	47.7	48.5	45.2	46.7	47.2	47.5	47.5	95.8
CI 9558 PIROLINE	10	57.7	69.7	58.1	58.0	34.5	46.3	46.3	100.0	50.9	49.3	50.3	50.6	48.0	49.6	49.6	100.0
PI537967 COLTER	3	-	73.2	56.7	55.4	-	61.8	46.2	99.7	-	41.6	42.2	44.5	-	45.1	44.7	90.1
MT886610 MT81143/LEWIS	3	-	-	50.2	57.0	33.9	47.0	43.4	93.7	-	-	46.3	48.7	48.7	47.9	47.8	96.5
MEANS (ENTRIES LISTED)		65.5	76.8	54.7	58.3	39.7	-	49.7	-	48.5	48.0	46.6	48.3	47.9	-	48.0	-
6/ Growing Season Precip. (in.)		7.53	9.60	3.93	8.71	3.62	7.02										
7/ Soil PAW (in.) to SD at @Plnt		5.52	7.24	6.84	5.09	6.01	6.46										
Total Plant Avail. Water (in.)		13.05	16.84	10.77	13.80	9.63	13.49										
Soil NO3 (lbs.) to SD @Plntng.		112.0	52.0	28.0	54.0	54.0											
SD (Sampling Depth in inches)		48.0	48.0	48.0	48.0	48.0											
Fertilizer Applied (# N)		70.0	62.0	66.0	66.0	71.0											
(# P2O5)		40.0	35.0	33.0	33.0	35.0											

Check variety is Piroline.

1/ See MCES Bulletin 1094 for evaluation of other important variety performance characteristics to include malting potential, disease resistance etc., before making variety selection decisions.

2/ P = Private variety, + = Protected variety.

3/ Only the last five are shown, but summary calculations include all years noted. In 1991 crop head shatter and head loss was substantial as crop was over-ripe for harvest by binder (necessary due to major plot combine breakdown).

4/ 10-yr. CA = (x/y) * z where x = average yield or test weight of the entry for years tested, y = average yield or test weight for Piroline for the same years, and z = 10-yr. average yield or test weight for the check variety Piroline.

5/ Percent of Piroline yield or test weight for the same data years as those in which the entry was tested.

6/ Seeding to 14 days prior to harvest maturity.

7/ Soil PAW values are actual gravimetric measurements.

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GRC
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TABLE 17. DRYLAND FALLOW BARLEY VARIETY EVALUATION NURSERY GROWN OFF-STATION AT MYERS FARMS, INC., BIG SANDY. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1996.

ID	VARIETY or SELECTION	STAND %	PLNT HT Inches	YIELD Bu/Ac	TEST WT Lbs/Bu	PLUMP %	THIN %	PROTEIN %
CI 15229	Steptoe	100.00	24.32	75.40	40.50	53.10	21.50	10.70
ND 9866	Stark	99.30	27.99	73.93	48.67	81.00	6.00	11.90
PI568246	Baronesse	100.00	23.77	73.13	46.70	64.60	14.00	12.50
H1851195	H1851195	100.00	26.46	72.87	45.57	60.90	15.70	13.10
PI483237	Bowman	98.97	27.22	72.47	49.07	90.20	2.50	12.00
MT886610	MT886610	100.00	27.87	69.57	45.57	54.70	21.10	12.70
PI591823	Chinook	100.00	26.17	68.93	44.77	36.40	32.30	13.00
CI 15856	Lewis	100.00	26.12	68.80	47.23	60.40	17.90	13.60
SK 76333	Harrington	100.00	26.44	68.60	45.03	51.10	21.50	13.00
CI 9558	Piroline	100.00	27.69	68.20	47.60	56.80	15.90	13.40
N1123111	Logan	100.00	25.20	67.27	46.83	62.00	15.00	12.90
H3860224	H3860224	99.67	25.33	66.50	45.03	72.70	12.20	13.10
PI537438	Targhee	100.00	25.49	66.07	44.03	64.00	17.00	12.60
CI 15514	Hector	100.00	28.41	65.03	46.77	59.00	16.70	12.80
PI491534	Gallatin	100.00	26.40	64.83	47.27	61.10	16.20	12.40
MN 56	Stander	99.30	26.63	63.90	45.70	68.20	10.10	11.90
EXPERIMENTAL MEANS		99.83	26.34	69.09	46.02	62.26	15.97	12.60
C.V. 2: (S OF MEAN/MEAN)*100		.34	1.77	4.63	.92	-	-	-
LSD (0.05)		.97	1.35	9.23	1.23	-	-	-

CLIMATIC and NURSERY MANAGEMENT DATA

Exp #: 96-3652-SB Field: OffSta Design: __RCB__ # Ents: 16 # Reps: 3 Plot-Obsrv: 54 sqft. Hvst-Obsrv: 48 sqft.
Qtr: ____SW____ Section: 13 Twnshp: 28 N Range: 10 E Latitude: 48.18 N Longitude: 110.40 W Elevation: 2800 ft.

Seeding Date: 05/15/96 Sd'g Depth: 1.25 in. Depth to Moisture @ Sd'g: 0.25 in. Moist Soil Depth @ Sd'g: 55.0+ in.
Soil Temp @ Sd'g: __._F @ 1 in. 64.0F @ 2 in. 58.0F @ 4 in. Soil Texture: VFSL Soil Series: _____
Cropping System: _X_ Fallow ___ Recrop _X_ Full-Till ___ Reduced-Till ___ No-Till # Tillages: 3 # Chem Apps: 0
Cropping System Details: __1995 Fallow Season = 2x Tillage w/Sweeps & Harrows; 1x Tillage w/Sweeps, Harrows & Rods__
Cropping History: 1 Yr Ago = 95 = ____Fallow____ 2 Yrs Ago = 94 = _Winter Wheat_ 3 Yrs Ago = 93 = ____Fallow____
Fertilizer: 55#N,22#P2O5, 0#K2O/ac via NH3+11-52-0 inj'd in sep PP ops Fall95 Herbicide: _'Bronate' @ 1.5 pts/ac__
Harvest Date: 08/26/96 Root Penetration Depth: 38 in. Comments: __Pre-Plant Soil Analysis was Post-Fertilization__

Depth	PRE-PLANT SOIL ANAL 05/15/96 Max Depth=48"								__/__/__	POST-HVST SOIL ANAL 08/26/96 (Max Depth=48"							
	in. PAW	pH	% OM	Lb/a NO3	ppm P	ppm K	ppm S	Soil Text	CEC Txt	in. PAW	in. PAW	pH	% OM	Lb/a NO3	ppm P	ppm K	ppm S	Soil Text	CEC Txt
0 -6"	.88	6.7	1.6	10	22	471	5	VFSL	14.5	_____	.16	6.2	1.2	10	22	430	9	VFSL	14.5
6-24"	3.29			90			17	VFSL+		_____	1.19			12			28	SCL-	
24-36"	2.80			28				CL		_____	.84			20				CL	
36-48"	2.04			132				CL		_____	1.70			196				CL	
TOTAL:	9.01			260						_____	3.89			238					

Precipitation & Stored Soil Water Summary: 05/15/96 to Sd'g: 0.00 in. (0.00 in events =>.1 in.) Calc'd Initial Soil Water @ Sd'g: 9.01 in.
05/15/96 to Hvst: 5.41 in. (5.36 in events =>.1 in.) Measured Resid Soil Water @ Hvst: 3.89 in.
Growing Season (05/15/96 to 14 days prior to Harvest Maturity: 8.04 in.) (8.00 in events =>.1 in.)
Post-Grwg Seas (14 days prior to Harvest Maturity to 08/26/96: 0.12 in.) (0.12 in events =>.1 in.)
Adj'd Summary: Init GS H2O Inv + 'Init GS Inv to Hvst' Prec - Hvst Resid H2O - 'PostGS' Prec (Calc'd ET: 13.28 in.)

TABLE 18. NINE-YEAR YIELD AND TEST WEIGHT SUMMARY ON SELECTED ENTRIES FROM A FALLOW SPRING BARLEY NURSERY GROWN OFF-STATION AT MYERS FARMS, INC., BIG SANDY. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1988-1996.

		1/ YIELD (BUSHELS PER ACRE)								TEST WEIGHT (POUNDS PER BUSHEL)							
2/ VARIETY OR SELECTION	NO. OF YEARS TESTED 3/	1992 4/	1993	1994	1995	1996	AVERAGE FOR YEARS TESTED	9-YR. COMPAR. AVERAGE YIELD 5/	PERCENT OF PIROLINE YIELD 6/	1992 4/	1993	1994	1995	1996	AVERAGE FOR YEARS TESTED	9-YR. COMPAR. AVERAGE TEST WT. 5/	PERCENT OF PIROLINE TEST WT. 6/
CI 15229 STEPTOE	9	30.2	113.3	68.2	101.6	75.4	65.3	65.3	110.2	39.8	43.8	37.6	43.4	40.5	42.4	42.4	87.8
PI537967 COLTER	3	-	113.8	60.0	84.3	-	86.0	61.5	103.9	-	43.6	38.5	44.3	-	42.1	41.5	86.0
PI483237 BOWMAN	9	22.0	104.8	74.4	93.3	72.5	60.5	60.5	102.3	42.5	49.1	46.7	49.7	49.1	48.5	48.5	100.6
NS 78054 BARONESSE (P+)	6	27.3	117.9	64.5	88.6	73.1	65.7	60.5	102.2	41.7	51.5	43.2	50.2	46.7	47.3	47.0	97.3
PI591823 CHINOOK	9	21.3	111.6	64.4	77.0	68.9	59.7	59.7	100.9	40.9	51.3	44.1	50.7	44.8	47.9	47.9	99.3
CI 9558 PIROLINE	9	25.6	109.1	59.7	79.6	68.2	59.2	59.2	100.0	44.4	51.5	43.6	51.9	47.6	48.3	48.3	100.0
MT886610 MT81143/LEWIS	3	-	-	60.2	76.2	69.6	68.6	58.8	99.2	-	-	43.1	51.1	45.6	46.6	47.1	97.7
MT 81161 MT 81161	4	25.1	106.0	-	-	-	54.7	58.4	98.6	39.9	50.3	-	-	-	45.7	46.5	96.4
PI531228 BEARPAW	6	24.5	103.3	-	-	-	53.4	58.3	98.4	40.6	50.5	-	-	-	46.9	46.6	96.6
MT890008 MT890008	3	-	104.3	59.3	78.4	-	80.7	57.7	97.4	-	48.4	43.3	49.6	-	47.1	46.4	96.1
MT860756 GALLATIN/BELLONA	3	26.5	101.1	61.3	-	-	63.0	57.5	97.2	42.1	51.4	44.6	-	-	46.1	47.8	99.0
MT851195 MT851195	4	-	99.4	61.1	73.4	72.9	76.7	57.4	96.9	-	48.9	43.4	50.1	45.6	47.0	46.6	96.6
CI 15856 LEWIS	9	23.6	109.7	60.5	65.0	68.8	57.3	57.3	96.7	41.8	53.2	43.2	51.5	47.2	48.5	48.5	100.4
ND 9866 STARK	7	26.5	104.0	68.7	69.6	73.9	60.7	56.5	95.3	42.4	49.6	45.7	50.1	48.7	48.4	48.0	99.5
SK 76333 HARRINGTON	9	25.4	102.0	55.5	81.3	68.6	55.7	55.7	94.0	40.7	50.8	42.2	48.7	45.1	46.9	46.9	97.2
PI491534 GALLATIN	9	23.3	101.5	58.1	64.2	64.8	55.6	55.6	93.9	42.8	51.6	43.7	51.6	47.3	48.3	48.3	100.1
CI 15514 HECTOR	9	21.5	102.5	58.3	75.2	65.0	55.0	55.0	93.0	41.3	51.0	42.0	50.6	46.8	47.9	47.9	99.2
CI 15857 CLARK	6	23.3	92.7	-	-	-	48.1	52.5	88.7	39.3	50.9	-	-	-	47.4	47.7	98.9
MEANS (ENTRIES LISTED)		24.7	105.7	62.3	79.1	70.1	-	58.2	-	41.4	49.9	43.0	49.5	46.2	-	46.9	-
7/ Growing Season Precip. (in.)		8.25	10.65	5.87	12.73	8.16	8.14										
8/ Soil PAW (in.) to SD at Plt.		6.14	6.29	7.94	5.43	7.03	7.13										
Total Plant Avail. Water (in.)		14.39	16.94	13.81	18.16	15.19	15.27										
Soil NO3 (lbs.) to SD at Plt.		200.0	158.0	260.0	178.0	260.0											
SD (sampling depth in inches)		48.0	48.0	48.0	48.0	48.0											
Fertilizer Applied (#N)		50.0	55.0	56.0	55.0	55.0											
(#P2O5)		24.0	22.0	22.0	22.0	22.0											
(#K2O)		0.0	0.0	0.0	0.0	0.0											

Check variety is Piroline.

1/ See MCES Bullutin 1094 for other important variety performance characteristics to include, malting potential, disease resistance, etc., before making variety selection decisions.

2/ P = Private variety, + = Protected variety.

3/ Only the last five years shown, but summary calculations include all years noted. In 1991 head shatter and head loss was substantial as crop was overripe for harvest by binder (necessary due to a major plot combine breakdown). Crop suffered minor hail damage on two occasions (5/20 & 7/13).

4/ 1992 nursery suffered poor intial stand development due to early drought conditions (through mid-June), and was later damaged by moderate hail.

5/ 9-yr. CA = (x/y)* z where x = average yield or test weight of the entry for the years tested, y = average yield or test weight of Piroline for the same years, and z = 9-yr. average of yield or test weight for the check variety Piroline.

6/ Percent of Piroline yield or test weight for the same data years as those in which the entry was tested

7/ Seeding to 14 days prior to harvest maturity.

8/ Soil PAW values are actual gravimetric measurements.

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TABLE 19. DRYLAND FALLOW BARLEY VARIETY EVALUATION NURSERY GROWN OFF-STATION AT THE MARK & NANCY PETERSON FARM, NORTH HAVRE. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1996.

ID	VARIETY or SELECTION	STAND %	PLNT HT Inches	YIELD Bu/Ac	TEST WT Lbs/Bu	PLUMP %	THIN %	PROTEIN %
N1123111	Logan	96.20	23.25	80.20	49.97	91.40	2.90	11.30
H3860224	H3860224	99.30	22.72	78.63	48.77	88.30	4.70	11.60
CI 15229	Steptoe	95.17	22.81	77.23	43.50	73.70	10.60	9.90
H1851195	H1851195	97.93	24.34	77.13	48.80	86.00	3.70	12.00
NS 78054	Baronesse	97.57	19.32	75.97	48.47	77.20	7.30	12.30
PI491534	Gallatin	100.00	24.72	75.30	49.10	73.20	9.70	11.50
PI591823	Chinook	93.77	23.10	75.17	50.23	83.60	5.60	11.70
CI 15514	Hector	98.60	25.58	73.67	49.20	68.60	12.10	12.30
ND 9866	Stark	98.60	25.28	73.50	50.93	94.70	2.00	11.20
CI 15856	Lewis	99.30	22.47	70.63	50.40	79.10	8.50	11.80
PI483237	Bowman	94.80	23.73	68.70	49.50	86.80	4.90	12.10
CI 9558	Piroline	98.97	25.63	68.63	49.97	74.30	7.50	12.10
MN 56	Stander	86.80	24.45	68.50	47.80	74.50	9.10	11.60
PI537438	Targhee	99.30	21.86	67.80	45.90	65.40	14.30	12.10
MT886610	MT886610	97.93	23.35	66.13	48.57	70.80	12.60	11.80
SK 76333	Harrington	97.20	21.48	64.13	47.37	85.60	4.50	11.90
EXPERIMENTAL MEANS		96.96	23.38	72.58	48.65	79.57	7.50	11.70
C.V. 2: (S OF MEAN/MEAN)*100		2.43	3.96	6.52	1.73	-	-	-
LSD (0.05)		6.82	2.68	13.68	2.44	-	-	-

CLIMATIC and NURSERY MANAGEMENT DATA

Exp #: 96-3653-SB Field: OffSta Design: __RCB__ # Ents: 16 # Reps: 3 Plot-Obsrv: 54 sqft. Hvst-Obsrv: 48 sqft.
Qtr: ___NENE___ Section: 32 Twnshp: 36 N Range: 13 E Latitude: 48.83 N Longitude: 110.03 W Elevation: 2800 ft.

Seeding Date: 05/10/96 Sd'g Depth: 1.25 in. Depth to Moisture @ Sd'g: 0.25 in. Moist Soil Depth @ Sd'g: 55.0+ in.
Soil Temp @ Sd'g: __.__F @ 1 in. 52.0F @ 2 in. 48.0F @ 4 in. Soil Texture: SCL Soil Series: _____
Cropping System: _X_ Fallow ___ Recrop ____ Full-Till ____ Reduced-Till _X_ No-Till # Tillages: 0 # Chem Apps: 2
Cropping System Details: _____'Fallow Master' (32oz 5/23/95 + ammonium sulfate, 44oz 7/13/95 + ammonium sulfate)____
Cropping History: 1 Yr Ago = 95 = __Chem Fallow_ 2 Yrs Ago = 94 = _Winter Wheat_ 3 Yrs Ago = 93 = ____Fallow____
Fertilizer: 56#N,25#P2O5, 8#K2O/ac via BlueJet/coulter liquid inject. 08/20/95_ Herbicide: _'Bronate' @ 1.5 pts/ac__
Harvest Date: 08/27/96 Root Penetration Depth: 42 in. Comments: __Pre-Plant Soil Analysis was Post-Fertilization__

Depth	PRE-PLANT SOIL ANAL 05/10/96 Max Depth=48"								__/__/__	POST-HVST SOIL ANAL 08/27/96 (Max Depth=48"							
	in. PAW	pH	% OM	Lb/a NO3	ppm P	ppm K	ppm S	Soil Text	CEC Txt	in. PAW	in. PAW	pH	% OM	Lb/a NO3	ppm P	ppm K	ppm S	Soil Text	CEC Txt
0 -6"	.78	7.8	1.3	10	14	220	7	VFSL+	14.5	_____	.18	7.7	1.0	2	25	246	20	SCL-	21.7
6-24"	2.65			42			16	VFSL+		_____	1.03			6			21	SCL-	
24-36"	1.99			8				CL-		_____	.68			4				SCL-	
36-48"	2.05			24				CL-		_____	1.61			20				CL-	
TOTAL:	7.47			84						_____	3.50			32					

Precipitation & Stored Soil Water Summary: 05/10/96 to Sd'g: 0.00 in. (0.00 in events =>.1 in.) Calc'd Initial Soil Water @ Sd'g: 7.47 in.
05/10/96 to Hvst: 4.50 in. (4.19 in events =>.1 in.) Measured Resid Soil Water @ Hvst: 3.50 in.
Growing Season (05/10/96 to 14 days prior to Harvest Maturity: 4.50 in.) (4.19 in events =>.1 in.)
Post-Grwg Seas (14 days prior to Harvest Maturity to 08/27/96: 0.00 in.) (0.00 in events =>.1 in.)
Adj'd Summary: Init GS H2O Inv + 'Init GS Inv to Hvst' Prec - Hvst Resid H2O - 'PostGS' Prec (Calc'd ET: 8.47 in.)

TABLE 20. TEN-YEAR YIELD AND TEST WEIGHT SUMMARY ON SELECTED ENTRIES FROM A FALLOW SPRING BARLEY VARIETY NURSERY GROWN OFF-STATION AT THE MARK AND NANCY PETERSON FARM, NORTH HAVRE. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1986-1995.

		1/ YIELD (BUSHELS PER ACRE)								TEST WEIGHT (POUNDS PER BUSHEL)							
2/ VARIETY OR SELECTION	NO. OF YEARS TESTED 3/	1992 4/	1993 5/	1994 6/	1995	1996	AVERAGE FOR YEARS TESTED	10-YR. COMPAR. AVERAGE YIELD 7/	PERCENT OF PIROLINE YIELD 8/	1992 4/	1993 5/	1994 6/	1995	1996	AVERAGE FOR YEARS TESTED	10-YR. COMPAR. AVERAGE TEST WT 7/	PERCENT OF PIROLINE TEST WT 8/
PI591823 CHINOOK	7	-	106.8	-	75.3	75.2	59.7	60.7	107.6	-	42.7	-	48.0	50.2	47.8	48.0	100.1
CI 15229 STEPTOE	8	-	94.6	-	81.7	77.2	60.4	60.4	107.1	-	36.8	-	40.9	43.5	41.1	41.1	85.7
PI483237 BOWMAN	8	-	115.8	-	72.6	68.7	60.3	60.3	106.9	-	42.8	-	48.4	49.5	48.4	48.4	100.8
NS 78054 BARONESSE (P+)	4	-	112.1	-	82.1	76.0	71.7	59.6	105.6	-	43.8	-	46.8	48.5	45.7	45.9	95.7
PI531228 BEARPAW	6	-	100.9	-	-	-	52.5	58.5	103.8	-	43.6	-	-	-	46.0	46.7	97.4
PI491534 GALLATIN	8	-	98.0	-	71.7	75.3	57.5	57.5	101.9	-	44.1	-	48.8	49.1	48.1	48.1	100.3
MT851195 MT851195	3	-	102.1	-	75.8	77.1	85.0	57.0	101.1	-	42.8	-	47.5	48.8	46.0	45.6	95.0
CI 15856 LEWIS	8	-	97.9	-	74.3	70.6	56.9	56.9	100.8	-	44.6	-	48.9	50.4	48.7	48.7	101.4
CI 9558 PIROLINE	8	-	104.7	-	79.0	68.6	56.4	56.4	100.0	-	45.1	-	50.3	50.0	48.0	48.0	100.0
ND 9866 STARK	5	-	108.4	-	72.8	73.5	61.8	56.3	99.8	-	42.1	-	49.2	50.9	48.3	48.1	100.2
CI 15857 CLARK	6	-	100.3	-	-	-	50.3	56.0	99.4	-	43.3	-	-	-	46.2	46.9	97.8
CI 15514 HECTOR	8	-	95.3	-	70.7	73.7	55.6	55.6	98.5	-	43.3	-	48.0	49.2	48.1	48.1	100.2
MT 81161 MT 81161	4	-	107.2	-	-	-	60.6	55.5	98.5	-	45.2	-	-	-	45.8	46.7	97.4
SK 76333 HARRINGTON	8	-	100.1	-	76.6	64.1	53.9	53.9	95.6	-	43.6	-	45.1	47.4	46.1	46.1	96.1
MEANS (ENTRIES LISTED)		-	103.2	-	75.7	72.7	-	57.5	-	-	43.1	-	47.4	48.9	-	46.9	-
9/ Growing Season Precip. (in.)		4.55	13.03	4.00	10.34	4.50	7.52										
10/ Soil PAW (in.) to SD @Pltng.		5.67	6.75	7.93	4.96	5.13	7.67										
Total Plant Avail. Water (in.)		10.22	19.78	11.93	15.30	9.63	15.19										
Soil NO3 (lbs.) to SD @Pltng.		198.0	162.0	110.0	104.0	84.0											
SD (Sampling Depth in inches)		48.0	48.0	48.0	48.0	48.0											
Fertilizer Applied (# N)		42.0	70.5	40.0	30.0	56.0											
(# P2O5)		25.0	25.0	30.0	15.0	25.0											
(# K2O)		10.0	10.0	0.0	7.0	8.0											

Check variety is Piroline.

1/ See MCES Bulletin 1094 for evaluation of other important variety performance characteristics to include malting potential, disease resistance, etc. before making variety selection decisions.

2/ P = Private variety, + = Protected variety.

3/ Only the five most recent years shown, but summary calculations include all years noted. In 1991 the crop suffered substantial hail damage plus further shatter loss via harvest of over-ripe crop by binder (necessary due to major plot combine breakdown).

4/ 1992 nursery was lost to hail damage.

5/ Stand was poor, resulting in inflated yields. The site also suffered moderate hail damage in late June.

6/ Results from the 1994 nursery were not used due to poor stand establishment resulting from severe crusting.

7/ 10-yr. CA = (x/y) * z where x = average yield or test weight of the entry for years tested, y = average yield or test weight for Piroline for the same years, and z = 10-yr. average yield or test weight for the check variety Piroline.

8/ Percent of Piroline yield or test weight for the same data years as those in which the entry was tested.

9/ Seeding to 14 days prior to harvest maturity.

10/ Soil PAW values are actual gravimetric measurements.

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TABLE 21. DRYLAND FALLOW BARLEY VARIETY EVALUATION NURSERY GROWN OFF-STATION AT GRAFF FARMS, INC., NORTH JOPLIN. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1996.

ID	VARIETY or SELECTION	STAND %	PLNT HT Inches	YIELD Bu/Ac	TEST WT Lbs/Bu	PLUMP %	THIN %	PROTEIN %
CI 9558	Piroline	100.00	27.80	75.87	48.77	50.30	20.00	13.40
ND 9866	Stark	97.93	30.29	74.47	48.93	76.00	9.10	12.50
N1123111	Logan	96.50	27.76	72.83	47.93	58.10	16.90	13.50
PI483237	Bowman	99.30	26.38	72.77	48.53	83.90	5.80	12.20
NS 78054	Baronesse	100.00	25.49	72.73	46.23	45.00	23.50	13.60
CI 15229	Steptoe	98.60	25.91	70.63	41.10	52.60	19.30	11.00
H1851195	H1851195	97.57	29.03	70.50	47.27	72.90	10.00	13.70
PI537438	Targhee	100.00	29.15	68.97	44.53	51.30	23.30	12.80
PI491534	Gallatin	99.33	26.85	68.90	46.67	40.90	27.70	13.60
CI 15856	Lewis	98.27	27.95	67.97	47.37	49.00	22.90	14.10
MT886610	MT886610	97.93	30.07	66.90	46.27	48.20	23.30	13.70
PI591823	Chinook	98.97	27.59	65.93	45.73	41.10	30.30	14.00
CI 15514	Hector	99.30	29.40	65.37	46.90	54.40	19.60	13.80
SK 76333	Harrington	95.13	27.65	64.00	44.40	47.30	22.10	14.10
MN 56	Stander	97.57	29.66	63.43	45.13	45.00	24.10	13.20
H3860224	H3860224	99.30	27.30	61.93	45.23	53.10	21.80	14.70
EXPERIMENTAL MEANS		98.48	28.02	68.95	46.31	54.32	19.98	13.37
C.V. 2: (S OF MEAN/MEAN)*100		1.24	3.59	5.08	1.38	-	-	-
LSD (0.05)		3.52	2.90	10.12	1.84	-	-	-

CLIMATIC and NURSERY MANAGEMENT DATA

Exp #: 96-3654-SB Field: OffSta Design: __RCB__ # Ents: 16 # Reps: 3 Plot-Obsrv: 54 sqft. Hvst-Obsrv: 48 sqft.
Qtr: ____SE____ Section: 8 Twnshp: 34 N Range: 7 E Latitude: 48.73 N Longitude: 110.83 W Elevation: 3300 ft.

Seeding Date: 05/09/96 Sd'g Depth: 1.50 in. Depth to Moisture @ Sd'g: 0.50 in. Moist Soil Depth @ Sd'g: 55.0+ in.
Soil Temp @ Sd'g: __._F @ 1 in. 43.0F @ 2 in. 42.0F @ 4 in. Soil Texture: CL Soil Series: Joplin-Hillon Cl Loam
Cropping System: _X_ Fallow ___ Recrop ___ Full-Till _X_ Reduced-Till ___ No-Till # Tillages: 2 # Chem Apps: 1
Cropping System Details: 95 Fallow Season = 1x Chem treatment w/10oz 'Roundup' early, + 2 tillage opn's summer 95___
Cropping History: 1 Yr Ago = 95 = ____Fallow____ 2 Yrs Ago = 94 = _Spring Wheat_ 3 Yrs Ago = 93 = ____Fallow____
Fertilizer:114#N,29#P2O5, 0#K2O/ac via NH3(55#N)fall95 +59-29-0 via gran.blend bnd'd at plntg_ Herbicide: None-App'd
Harvest Date: 08/28/96 Root Penetration Depth: 39 in. Comments: Pre-Plnt Soil Anal=Post-Fall Fert, & Pre-Spr Fert_

Depth	PRE-PLANT SOIL ANAL 05/09/96 Max Depth=48"								__/__/__	POST-HVST SOIL ANAL 08/28/96 (Max Depth=48"							
	in. PAW	pH	% OM	Lb/a NO3	ppm P	ppm K	ppm S	Soil Text	CEC Txt	in. PAW	in. PAW	pH	% OM	Lb/a NO3	ppm P	ppm K	ppm S	Soil Text	CEC Txt
0 -6"	1.21	7.7	1.7	40	13	274	13	CL	21.8	_____	.32	7.3	1.3	8	13	275	8	CL	21.8
6-24"	4.15			54			22	CL		_____	1.01			12			15	SCL	
24-36"	2.59			52				CL-		_____	1.03			20				SCL	
36-48"	2.28			48				CL-		_____	1.68			32				SCL	
TOTAL:	10.23			194						_____	4.04			72					

Precipitation & Stored Soil Water Summary: 05/09/96 to Sd'g: 0.00 in. (0.00 in events =>.1 in.) Calc'd Initial Soil Water @ Sd'g: 10.23 in.
05/09/96 to Hvst: 4.94 in. (N/A in events =>.1 in.) Measured Resid Soil Water @ Hvst: 4.04 in.
Growing Season (05/09/96 to 14 days prior to Harvest Maturity: 4.93 in.) (N/A in events =>.1 in.)
Post-Grwg Seas (14 days prior to Harvest Maturity to 08/28/96: 0.01 in.) (0.00 in events =>.1 in.)
Adj'd Summary: Init GS H2O Inv + 'Init GS Inv to Hvst' Prec - Hvst Resid H2O - 'PostGS' Prec (Calc'd ET: 11.18 in.)

TABLE 22. EIGHT-YEAR YIELD AND TEST WEIGHT SUMMARY ON SELECTED ENTRIES FROM A FALLOW SPRING BARLEY NURSERY GROWN OFF-STATION AT GRAFF FARMS, INC., JOPLIN. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1989-1996.

		1/ YIELD (BUSHELS PER ACRE)								TEST WEIGHT (POUNDS PER BUSHEL)							
2/ VARIETY OR SELECTION	NO. OF YEARS TESTED 3/	1992 4/	1993	1994	1995	1996	AVERAGE FOR YEARS TESTED	8-YR. COMPAR. AVERAGE YIELD 5/	PERCENT OF PIROLINE YIELD 6/	1992 4/	1993	1994	1995	1996	AVERAGE FOR YEARS TESTED	8-YR. COMPAR. AVERAGE TEST WT 5/	PERCENT OF PIROLINE TEST WT 6/
MT860756 GALLATIN/BELLONA	3	70.6	83.3	48.4	-	-	67.4	68.6	110.3	49.4	51.6	49.2	-	-	50.1	50.1	100.8
CI 15229 STEPTOE	8	60.2	90.4	54.0	96.1	70.6	68.3	68.3	109.9	42.8	43.2	42.3	43.5	41.1	43.0	43.0	86.5
MT 81161 MT 81161	3	71.5	79.6	-	-	-	70.0	67.9	109.2	48.6	50.2	-	-	-	48.3	48.2	97.0
PI537967 COLTER	3	-	83.8	47.8	94.5	-	75.4	67.4	108.5	-	43.8	45.0	45.2	-	44.7	43.7	88.0
MT890008 MT890008	3	-	87.0	40.5	98.4	-	75.3	67.4	108.4	-	48.6	46.2	50.8	-	48.5	47.5	95.7
NS 78054 BARONESSE (P+)	6	71.2	90.5	46.4	97.4	72.7	70.0	66.5	107.0	48.2	49.4	47.7	50.8	46.2	47.8	47.8	96.1
PI483237 BOWMAN	8	63.6	89.4	49.2	88.5	72.8	65.3	65.3	105.1	47.6	49.4	49.9	51.7	48.5	49.7	49.7	100.1
PI491534 GALLATIN	8	74.7	76.0	44.9	84.9	68.9	64.4	64.4	103.7	49.8	50.8	49.4	52.1	46.7	49.8	49.8	100.1
MT851195 MT851195	4	-	82.1	47.0	93.3	70.5	73.2	64.1	103.1	-	50.4	48.5	51.5	47.3	49.4	48.9	98.4
PI591823 CHINOOK	8	68.9	86.4	45.0	77.1	65.9	63.8	63.8	102.7	48.7	51.3	49.5	51.5	45.7	49.0	49.0	98.7
CI 15856 LEWIS	8	64.5	84.6	47.7	85.2	68.0	63.4	63.4	102.1	49.2	52.0	49.6	51.9	47.4	49.8	49.8	100.2
ND 9866 STARK	7	63.3	71.8	49.9	79.1	74.5	64.1	62.6	100.7	48.8	50.5	50.5	52.6	48.9	50.4	50.2	101.1
MT 81616 BEARPAW	5	67.6	73.0	-	-	-	59.7	62.6	100.7	48.6	50.1	-	-	-	47.5	47.7	95.9
CI 9558 PIROLINE	8	57.7	83.4	42.3	82.7	75.9	62.2	62.2	100.0	49.5	51.3	48.2	52.8	48.8	49.7	49.7	100.0
MT886610 MT81143/LEWIS	3	-	-	45.8	86.7	66.9	66.5	61.7	99.3	-	-	49.0	51.3	46.3	48.9	48.6	97.9
CI 15514 HECTOR	8	61.5	75.4	40.7	78.6	65.4	60.0	60.0	96.6	49.4	50.3	49.3	51.5	46.9	49.2	49.2	99.1
SK 76333 HARRINGTON	8	64.5	84.2	41.7	90.5	64.0	59.5	59.5	95.7	48.1	49.4	46.8	51.0	44.4	47.4	47.4	95.5
CI 15857 CLARK	5	61.3	73.9	-	-	-	55.4	58.1	93.5	48.4	50.1	-	-	-	48.3	48.4	97.5
MEANS (ENTRIES LISTED)		65.8	82.0	46.1	88.1	69.7	-	64.1	-	48.4	49.5	48.1	50.6	46.5	-	48.3	-
7/ Growing Season Precip. (in.)		9.23	12.45	2.83	12.66	NA	8.50										
8/ Soil PAW (in.) to SD at Plt.		6.64	5.76	9.31	5.61	6.94	7.87										
Total Plant Avail. Water (in.)		15.87	18.21	12.14	18.27	6.94	16.37										
Soil NO3 (lbs.) to SD at Plt.		96.0	112.0	108.0	62.0	194											
SD (sampling depth in inches)		48.0	48.0	48.0	48.0	48.0											
Fertilizer Applied (#N)		70.0	55.0	90.0	38.0	114.0											
(#P2O5)		40.0	0.0	0.0	19.0	29.0											
(#K2O)		0.0	0.0	0.0	7.0	0.0											

Check variety is Piroline.

1/ See MCES Bullutin 1094 for other important variety performance characteristics to include, malting potential, disease resistance, etc., before making variety selection decisions.

2/ P = Private variety, + = Protected variety.

3/ Only the five most recent years shown, but summary calculations include all years noted.

4/ 4 in. wet snow on 8/23 resulted in moderate lodging & shatter loss to mature crop.

5/ 8-yr. CA = (x/y)* z where x = average yield or test weight of the entry for the years tested, y = average yield or test weight of Piroline for the same years, and z = 8-yr. average of yield or test weight for the check variety Piroline.

6/ Percent of Piroline yield or test weight for the same data years as those in which the entry was tested

7/ Seeding to 14 days prior to harvest maturity.

8/ Soil PAW values are actual gravimetric measurements.

Hr
GRC
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TABLE 23. DRYLAND FALLOW BARLEY VARIETY EVALUATION NURSERY GROWN OFF-STATION AT FLANSAAS/LUMSDEN FARMS, LORING. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1996.

ID	VARIETY or SELECTION	STAND %	PLNT HT Inches	YIELD Bu/Ac	TEST WT Lbs/Bu	PLUMP %	THIN %	PROTEIN %
H3860224	H3860224	91.00	19.93	40.67	47.20	84.40	4.70	14.00
H1851195	H1851195	90.60	20.85	39.87	46.87	82.60	5.00	14.10
CI 15514	Hector	93.07	20.43	39.27	48.57	78.30	7.50	13.30
CI 15856	Lewis	89.60	19.36	39.13	48.87	80.10	7.20	14.40
PI591823	Chinook	89.97	20.03	38.80	46.97	62.30	14.80	13.60
CI 15229	Steptoe	90.97	16.50	38.73	41.90	83.50	5.70	11.10
NS 78054	Baronesse	89.90	18.37	38.13	48.00	83.90	4.70	13.90
PI491534	Gallatin	95.83	20.26	37.93	48.53	78.70	7.00	13.20
N1123111	Logan	88.20	19.70	37.67	47.27	85.00	4.60	13.10
ND 9866	Stark	91.67	20.41	37.17	49.57	96.30	.80	13.00
CI 9558	Piroline	88.90	19.54	36.50	48.03	75.30	6.20	14.30
SK 76333	Harrington	89.90	18.62	36.47	47.50	84.10	4.90	13.80
PI483237	Bowman	89.23	20.03	36.40	49.80	95.40	1.30	13.00
MT886610	MT886610	91.33	19.36	36.10	48.53	77.60	8.90	13.40
PI537438	Targhee	90.63	19.44	35.57	46.20	78.10	8.30	13.60
MN 56	Stander	82.60	18.54	29.57	46.93	90.50	2.40	12.90
EXPERIMENTAL MEANS		90.21	19.46	37.37	47.55	82.26	5.88	13.42
C.V. 2: (S OF MEAN/MEAN)*100		2.95	3.10	5.46	.71	-	-	-
LSD (0.05)		7.68	1.74	5.89	.98	-	-	-

CLIMATIC and NURSERY MANAGEMENT DATA

Exp #: 96-3655-SB Field: OffSta Design: __RCB__ # Ents: 16 # Reps: 3 Plot-Obsrv: 54 sqft. Hvst-Obsrv: 48 sqft.
Qtr: _____ Section: 24 Twnshp: 35 N Range: 29 E Latitude: 48.78 N Longitude: 107.88 W Elevation: 2700 ft.

Seeding Date: 05/11/96 Sd'g Depth: 1.25 in. Depth to Moisture @ Sd'g: 0.50 in. Moist Soil Depth @ Sd'g: 55.0+ in.
Soil Temp @ Sd'g: __.__F @ 1 in. 54.0F @ 2 in. 48.0F @ 4 in. Soil Texture: SCL Soil Series: _____
Cropping System: _X_ Fallow ___ Recrop _X_ Full-Till ___ Reduced-Till ___ No-Till # Tillages: 4 # Chem Apps: 0
Cropping System Details: __1995 Fallow Season = 2x Tillage w/Sweeps, 2x Tillage w/Sweeps & Rods_____
Cropping History: 1 Yr Ago = 95 = ____Fallow____ 2 Yrs Ago = 94 = _SPRING WHEAT_ 3 Yrs Ago = 93 = ____Fallow____
Fertilizer: 57#N,28#P2O5, 0#K2O/ac via gran.blend bnd'd 1.5" below seed Herbicide: ___2,4-D+'Ally' @ N/A+.1oz/ac___
Harvest Date: 08/29/96 Root Penetration Depth: 38 in. Comments: __Pre-Plant Soil Analysis was Pre-Fertilization___

Depth	PRE-PLANT SOIL ANAL 04/22/96 Max Depth=48"									__/__/__	POST-HVST SOIL ANAL 08/29/96 (Max Depth=48"							
	in. PAW	pH	% OM	Lb/a NO3	ppm P	ppm K	ppm S	Soil Text	CEC Txt	in. PAW	in. PAW	pH	% OM	Lb/a NO3	ppm P	ppm K	ppm S	Soil Text	CEC Txt
0 -6"	.81	6.1	1.3	10	18	362	8	SCL-	21.7	_____	.19	6.1	1.4	14	19	336	7	SCL-	21.7
6-24"	3.10			18			14	SCL		_____	1.42			12			14	SCL	
24-36"	1.60			4				SCL		_____	.96			4				CL	
36-48"	1.18			8				CL		_____	____			___				___	
TOTAL:	6.69			40						_____	2.57			30					

Precipitation & Stored Soil Water Summary: 04/22/96 to Sd'g: 0.30 in. (0.27 in events =>.1 in.) Calc'd Initial Soil Water @ Sd'g: 6.99 in.
05/11/96 to Hvst: 3.22 in. (2.73 in events =>.1 in.) Measured Resid Soil Water @ Hvst: 2.57 in.
Growing Season (05/11/96 to 14 days prior to Harvest Maturity: 3.19 in.) (2.73 in events =>.1 in.)
Post-Grwg Seas (14 days prior to Harvest Maturity to 08/29/96: 0.03 in.) (0.00 in events =>.1 in.)
Adj'd Summary: Init GS H2O Inv + 'Init GS Inv to Hvst' Prec - Hvst Resid H2O - 'PostGS' Prec (Calc'd ET: 7.64 in.)

TABLE 24. ONE-YEAR YIELD AND TEST WEIGH SUMMARY ON SELECTED ENTRIES FROM A FALLOW SPRING BARLEY VARIETY NURSERY GROWN OFF-STATION ON THE FLANSAAS/LUMSDEN FARM, LORING. NORTHERN AGRICULTURAL RESEARCH CENTER. 1996.

2/ VARIETY OR SELECTION	NO. OF YEARS TESTED	1/ YIELD (BUSHELS PER ACRE) 1996	1997	1998	1999	2000	AVERAGE FOR YEARS TESTED	1-YR. COMPAR. AVERAGE YIELD 3/	PERCENT OF PIROLINE YIELD 4/	TEST WEIGHT (POUNDS PER BUSHEL) 1996	1997	1998	1999	2000	AVERAGE FOR YEARS TESTED	1-YR. COMPAR. AVERAGE TEST WT 3/	PERCENT OF PIROLINE TEST WT 4/
H3860224 LEWIS/APEX	1	40.7	-	-	-	-	40.7	40.7	111.4	47.2	-	-	-	-	47.2	47.2	98.3
MT851195 MT851195	1	39.9	-	-	-	-	39.9	39.9	109.2	46.9	-	-	-	-	46.9	46.9	97.6
CI 15514 HECTOR	1	39.3	-	-	-	-	39.3	39.3	107.6	48.6	-	-	-	-	48.6	48.6	101.1
CI 15856 LEWIS	1	39.1	-	-	-	-	39.1	39.1	107.2	48.9	-	-	-	-	48.9	48.9	101.7
PI591823 CHINOOK	1	38.8	-	-	-	-	38.8	38.8	106.3	47.0	-	-	-	-	47.0	47.0	97.8
CI 15229 STEPTOE	1	38.7	-	-	-	-	38.7	38.7	106.1	41.9	-	-	-	-	41.9	41.9	87.2
NS 78054 BARONESSE (P+)	1	38.1	-	-	-	-	38.1	38.1	104.5	48.0	-	-	-	-	48.0	48.0	99.9
PI491534 GALLATIN	1	37.9	-	-	-	-	37.9	37.9	103.9	48.5	-	-	-	-	48.5	48.5	101.0
N1123111 LOGAN	1	37.7	-	-	-	-	37.7	37.7	103.2	47.3	-	-	-	-	47.3	47.3	98.4
ND 9866 STARK	1	37.2	-	-	-	-	37.2	37.2	101.8	49.6	-	-	-	-	49.6	49.6	103.2
CI 9558 PIROLINE	1	36.5	-	-	-	-	36.5	36.5	100.0	48.0	-	-	-	-	48.0	48.0	100.0
SK 76333 HARRINGTON	1	36.5	-	-	-	-	36.5	36.5	99.9	47.5	-	-	-	-	47.5	47.5	98.9
PI483237 BOWMAN	1	36.4	-	-	-	-	36.4	36.4	99.7	49.8	-	-	-	-	49.8	49.8	103.7
MT886610 MT81143/LEWIS	1	36.1	-	-	-	-	36.1	36.1	98.9	48.5	-	-	-	-	48.5	48.5	101.0
PI537438 TARGHEE	1	35.6	-	-	-	-	35.6	35.6	97.5	46.2	-	-	-	-	46.2	46.2	96.2
MN 56 STANDER	1	29.6	-	-	-	-	29.6	29.6	81.0	46.9	-	-	-	-	46.9	46.9	97.7
MEANS (ENTRIES LISTED)		37.4	-	-	-	-	-	37.4	-	47.5	-	-	-	-	-	47.5	-
5/ Growing Season Precip. (in.)		3.19					3.19										
6/ Soil PAW (in.) to SD at @Plnt		5.26					5.26										
Total Plant Avail. Water (in.)		8.45					8.45										
Soil NO3 (lbs.) to SD @Plntng.		40.0															
SD (Sampling Depth in inches)		48.0															
Fertilizer Applied (# N)		57.0															
(# P2O5)		28.0															

Check variety is Piroline.

1/ See MCES Bulletin 1094 for evaluation of other important variety performance characteristics to include malting potential, disease resistance etc., before making variety selection decisions.

2/ P = Private variety, + = Protected variety.

3/ 1-yr. CA = (x/y) * z where x = average yield or test weight of the entry for years tested, y = average yield or test weight for Piroline for the same years, and z = 1-yr. average yield or test weight for the check variety Piroline.

4/ Percent of Piroline yield or test weight for the same data years as those in which the entry was tested.

5/ Seeding to 14 days prior to harvest maturity.

6/ Soil PAW values are actual gravimetric measurements.