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

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Cooperating County Extension Agents
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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 1993-1998 statewide total (38% and 30% 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 and other resource 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. A new, standardized system was initiated in 1995 for better management and dissemination of such `base data' in more detail than that provided previously. However, such `base data' for 2001 is not included in this report as the information is yet pending final summarization due to a vacancy in NARC-Agronomy's technical support position throughout the 2001 crop and data season.

RESULTS:

Data details for individual trials conducted from 1983-2000 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 as applicable. 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 included in a separate report.

Cropping environments in 2001 ranged from extremely poor to good across North Central Montana. At Havre, total annual growing season precipitation (9/1/00 through 8/31/01) was 8.83 inches, 26 percent less than the average for all years since 1916. April 1 through July 31 precipitation was 4.81 inches or 71 percent of the 86-year average. Heat units expressed as "Growing Degree Days" (GDD, base 50) were 108 percent of the average for the last 51 years (1951-2001). The last spring frost was 12 days early with the first fall frost 12 days late resulting in 152 frost-free days, 24 days longer than the 86-year average. September 2000 through March 2001 precipitation was 90 percent of the long-term average, but added little to stored soil moisture. The April through July growing season saw an average daily temperature at 59 degrees F, slightly above normal, but winds were relentless. July and August average temperatures were 5 percent higher than normal with the high for 2001 recorded on August 4 at 106 degrees F. There were 44 days over 90 degrees F, 167% of the average at 26.3. These conditions resulted in severely reduced crop yields, abnormally high protein and moderate reduction in grain test weight. Minimum winter temperature was -26 degrees F on December 12. Crop outlook was initially bleak with limited surface soil moisture and sluggish early crop development. Yield and test weight comparisons with long-term averages varied according to crop and location (WW=low yields and moderately low test weights, SW=low yields and low test weights, BLY=very low yields and relatively normal test weights, and OAT=extremely low yields and low to normal test weights). The above trends were largely associated with timeliness of planting which was of greater importance than usual in 2001. Some later plantings escaped critical heat periods and benefited from a mid-July rain that was the only significant precipitation

event during the growing season. Late plantings in areas missed by the July rain resulted in very low yields and severely decreased test weights in 2001.

Off-station cropping environments were extremely variable in 2001. The Loma location had far below-average precipitation and suffered from substantial heat stress during periods critical to the production of cereal crops (especially spring crops). High winds were the norm accentuating the effects of the wheat stem sawfly. Experiment "coefficient of variation" values were expectedly higher than normal. The Turner and Loring locations had average to above-average precipitation, but it did not necessarily come in a timely manner. The North Havre area in general again saw wide variability in precipitation, but from only fair to practically none. Most locations recorded yields commensurate with moisture. Protein levels for appropriately fertilized wheat and barley were generally very good to excellent. Protein values were abnormally high in those areas most seriously affected by drought and heat stress.

Stand percent, plant height, yield, test weight, and protein data for the McKeever (Loma) dryland winter wheat trial conducted in 2001 are summarized in Table 1. The Heavey (North Havre) location was lost to lack of appropriate fall stand and winter injury. Both the McKeever and Heavey (or Morse) locations north of Havre were new in 1998, replacing the former long-term Myers (Big Sandy, 1982-1998) and Peterson (North Havre, 1982-1997) locations. Although extensive sawfly-related winter and spring wheat plot work was initiated at the McKeever location in 1998, the standard off-station winter wheat nursery was not relocated there until 1999. Three-year yield and test weight summary data for selected winter wheat entries at the McKeever location are presented in Table 2.

Stand percent, plant height, yield, test weight and protein data for the 2001 Cederberg (Turner), Flansaas/Lumsden (Loring) and McKeever (Loma) dryland spring wheat trials are summarized in Tables 3, 5 and 7, respectively. The Cederberg location, in place since 1982, further featured "fertilized vs. unfertilized" spring wheat variety performance evaluations (1994-1998). The Flansaas/Lumsden location replaced the 10-year Solberg location at Dodson (1986-1995). The McKeever location replaces the former, long-term Myers location (Big Sandy, 1988-1997). Multi-year yield and test weight summaries for selected spring wheat entries at the Cederberg, Flansaas/Lumsden and McKeever locations are presented in Tables 4, 6 and 8, respectively.

Stand percent, plant height, yield, test weight, plump/thin and protein data for the 2001 Cederberg (Turner), Flansaas/Lumsden (Loring) and McKeever (Loma) dryland spring barley trials are summarized in Tables 9, 11 and 13, respectively. The Cederberg location, in place since 1982, further featured "fertilized vs. unfertilized" barley variety performance evaluations (1994-1998). The Flansaas/Lumsden location replaces the 10-year Solberg location at Dodson (1986-1995). The McKeever location replaces the former long-term Myers location (Big Sandy, 1988-1997), but barley variety evaluation was not initiated there until 1999. Multi-year yield and test weight summaries for selected spring barley entries at the Cederberg, Flansaas/Lumsden, and McKeever locations are presented in Tables 10, 12 and 14, respectively.

SUMMARY:

Eight, 2001 off-station variety performance trials were conducted on mechanical or chemical fallow at three locations in three northern Montana counties.

Dryland Winter Wheat Trials:

1. McKeever Farm & Seed, Inc., Chouteau County	(12N Loma)	28-27N-10E
2. Joe & Jim Heavey Farm, Hill County	(30N Havre)	34-37N-15E

Dryland Spring Wheat Trials:

1. Leon Cederberg Farm, Blaine County	(3NE Turner)	13-36N-25E
2. Flansaas/Lumsden Farm, Phillips County	(1SW Loring)	24-35N-29E
3. McKeever Farm & Seed, Inc., Chouteau County	(12N Loma)	8-27N-10E

Dryland Spring Barley Trials:

1. Leon Cederberg Farm, Blaine County	(3NE Turner)	13-36N-25E
2. Flansaas/Lumsden Farm, Phillips County	(1SW Loring)	24-35N-29E
3. McKeever Farm & Seed, Inc., Chouteau County	(12N Loma)	8-27N-10E

All trials were seeded in replicated, 3-row, 20-foot plots on a 12-inch row spacing utilizing a self-propelled cone seeder. Trials (1988-1991) were planted with hoe openers fitted with `Acra-Plant' or JD 3" shovels. Beginning with spring planting in 1992, all off-station trials were planted with modified `Haybuster' openers. A randomized complete block design was standard for all trials with three replications. Beginning in 1997, a `Wintersteiger 1541-21' plot combine, funded in part by MWBC was used to harvest each 3-row plot after end-trimming to 16'. Prior to 1997, a `Hege 125C' plot combine, also funded in part by MWBC in 1984, was used. 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, with drought, budget and other resources allowing, to continue off-station cereal variety investigations in the five-county area. This work has been strongly supported by producers near most of the locations, and by the Northern Ag Research Center Advisory Committee. Budgets aside, expanded overall workload suggested that the number of replicated, off-station variety trial locations needed to be reduced - at least for the time being. Spring grains were dropped in 1997 (after 10 years of data) at the Myers/ Big Sandy location. This was an excellent location with truly outstanding producer cooperation and support. However, current sawfly-resistant variety development efforts involve establishment and maintenance of 7,000-8,000 plots on the McKeever Farm only a few miles away where conditions (other than sawfly pressure) are quite similar. Thus, the Big Sandy location has been put on hold for the time being; and standard off-station winter wheat, spring wheat and barley variety trials have been established at the Loma sawfly research site. In addition, spring grains were dropped from the North Havre location when it was relocated from the Peterson Farm to the Morse Farm for winter wheat variety evaluation only, in the fall of 1997. And, although the cooperating producer interest and support at the former Graff location north of Joplin (spring wheat and barley varieties) was excellent, a need to reduce overall workload made it necessary to discontinue this location after collecting ten years of data.

It is planned to continue off-station spring wheat and barley variety evaluations at the Cederberg (Turner) and Flansaas/Lumsden (Loring) locations. The Loring location is entering its' seventh year, and the cooperator and area producer interest and support has been outstanding. The Turner location is only 32 miles from the Loring site, but conditions there are quite different; and it is our opinion that the Turner location should be continued at least until 2002 which will mark 15 years at the present site (plus 5 years on a different soil series at a site nearby). However, the double plantings at Turner comparing fertilized vs. unfertilized plots were terminated following the 1998 crop year as originally planned. Cooperating producer and general community interest and support at Turner is outstanding.

Data processed by the Center will normally be limited to trials where the Center performs all field functions from planting to harvest. Special arrangements may be made with Extension Agents desiring to conduct additional replicated trials on their own. Packaged seed can likely again be provided to the County Extension Agents as per their needs for non-replicated demonstration 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 former Graff, and current Flansaas/Lumsden locations in Liberty and Phillips Counties were selected in this manner.

It is our current opinion that effort put forth 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. This is particularly true when critical season workload results in less than timely planting and maintenance of certain sites.

TABLE 1. Dryland Fallow Winter Wheat Cultivar Evaluation Nursery Grown Off-Station in a Wheat Stem Sawfly Environment at McKeever Farm & Seed, Inc., Loma. Northern Agricultural Research Center. Havre, Montana. 2001. (Exp# 01-3853-WW)

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/ YIELD Bu/Ac	TEST WT Lbs/Bu	2/ PROTEIN %
PI593889	RAMPART (sawfly resistant)	88.6	17.1	16.4	55.0	17.0
PI593891	VANGUARD (sawfly resistant)	85.8	17.5	15.7	54.6	17.2
CI 17879	ROCKY	92.3	16.1	13.3	56.6	16.6
MTW9441	NUWEST/TIBER	91.4	19.3	13.2	55.0	17.4
PI517194	TIBER	89.8	15.7	13.1	54.3	17.2
PI584526	JUDITH	86.4	18.2	12.4	51.9	17.1
CI 17860	NEELEY	89.5	16.3	12.3	51.7	16.8
MT9982	PROMONTORY/JUDITH	94.1	17.3	12.0	54.9	16.7
PI593890	MCGUIRE	92.6	15.5	11.5	55.6	17.6
MT 9432	BIGSKY	88.0	18.3	11.4	55.0	17.6
PI599336	MORGAN	94.7	16.8	10.9	53.1	17.5
RH78W296	BIGHORN	91.1	15.2	10.7	54.9	16.9
PI564761	ERHARDT	93.2	15.2	10.2	54.9	18.0
PI596352	ELKHORN	95.1	16.1	9.4	53.2	17.1
PI555458	PROMONTORY	92.6	15.8	9.3	55.2	16.6
CI 17735	NORSTAR	90.1	17.8	9.2	54.0	17.8
PI607569	RANSOM	89.8	15.3	9.2	53.3	17.1
UT944158	GOLDEN SPIKE	95.1	16.7	9.1	53.8	17.1
PI584505	HALT	92.0	13.6	8.9	54.9	17.1
PI605741	NUPLAINS	93.2	15.8	8.8	57.5	17.6
PI586806	NUWEST	87.7	17.1	8.8	55.3	17.3
MT 9426	MT8030/NLY	92.3	14.7	8.5	53.0	17.5
MT9513	MT7811/MT8030	92.0	16.6	7.7	52.8	17.4
PI594920	UTAH 100	93.2	15.7	6.1	53.7	16.8
EXPERIMENTAL MEANS		91.3	16.4	10.8	54.3	17.2
LSD (0.05)		7.2	2.8	4.2	1.0	.
C.V. 2: (S OF MEAN/MEAN)*100		2.8	6.0	13.7	0.6	.

1/ Volumetric yields are based on 60 lbs/bu as the standard test weight for wheat.
2/ Protein values are adjusted to 12 percent grain moisture.

TABLE 2. Three-Year Yield and Test Weight Summary of Selected Entries from Dryland Fallow Winter Wheat Variety Nurseries Grown Off-Station in a Wheat Stem Sawfly Environment at McKeever Farm & Seed, Inc., Loma. Northern Agricultural Research Center. Havre, Montana. 1999-2001.

			1/ YIELD (Bushels Per Acre)						TEST WEIGHT (Pounds Per Bushel)					
2/ VARIETY or SELECTION		No. of YEARS TESTED	1999	2000	2001	AVE. for YEARS TESTED	% of CHECK YIELD	**3-YR COMP. AVE. YIELD**	1999	2000	2001	AVE. for YEARS TESTED	% of CHECK TEST WT	**3-YR COMP. AVE. TEST WT**
PI593889	RAMPART (sawfly resis.)	3	35.9	42.7	16.4	31.7	116.7	**31.7**	61.8	62.2	55.0	59.6	100.9	**59.6**
PI517194	TIBER	3	36.7	44.9	13.1	31.6	116.2	**31.6**	62.4	62.7	54.3	59.8	101.2	**59.8**
CI 17879	ROCKY	3	33.2	47.0	13.3	31.2	114.7	**31.2**	62.8	63.6	54.6	60.3	102.1	**60.3**
PI584526	JUDITH	3	43.7	36.1	12.4	30.7	113.2	**30.7**	61.4	60.6	51.9	58.0	98.1	**58.0**
PI593891	VANGUARD (sawfly res.)	3	32.6	41.4	15.7	29.9	110.1	**29.9**	62.3	62.3	54.6	59.7	101.1	**59.7**
MT 9432	BIGSKY (+)	3	39.6	38.5	11.4	29.8	109.8	**29.8**	63.2	62.6	55.0	60.3	102.0	**60.3**
PI584505	HALT	3	33.1	46.9	8.9	29.6	109.1	**29.6**	62.6	62.8	54.9	60.1	101.7	**60.1**
PI599336	MORGAN (P+)	3	40.6	37.2	10.9	29.6	108.9	**29.6**	61.8	61.9	53.1	59.0	99.8	**59.0**
CI 17860	NEELEY	3	34.9	39.5	12.3	28.9	106.3	**28.9**	61.6	61.9	51.7	58.4	98.8	**58.4**
PI555458	PROMONTORY (+)	3	35.8	39.7	9.3	28.3	104.1	**28.3**	63.5	63.5	55.2	60.7	102.8	**60.7**
PI593890	McGUIRE	3	34.6	37.3	11.5	27.8	102.3	**27.8**	62.4	61.9	55.6	60.0	101.5	**60.0**
PI564761	ERHARDT	3	38.3	34.3	10.2	27.6	101.6	**27.6**	62.4	62.7	54.9	60.0	101.5	**60.0**
RH78W296	BIGHORN (P+)	3	37.3	34.2	10.7	27.4	100.9	**27.4**	62.7	62.6	54.9	60.0	101.6	**60.0**
CI 17735	NORSTAR	3	35.8	36.5	9.2	27.2	100.0	**27.2**	61.1	62.2	54.0	59.1	100.0	**59.1**
MTW 9441	NUWEST/TIBER (hrd wht)	3	35.8	27.5	13.2	25.5	93.8	**25.5**	61.8	61.1	55.0	59.3	100.4	**59.3**
PI586806	NUWEST (hard white)	3	32.8	34.0	8.8	25.2	92.7	**25.2**	60.9	61.7	55.3	59.3	100.4	**59.3**
PI596352	ELKHORN	3	25.1	36.7	9.4	23.7	87.4	**23.7**	59.9	62.3	53.2	58.5	99.0	**58.5**
MEANS (For Entries Listed)			35.6	38.5	11.6			28.6	62.0	62.3	54.3			59.5
5/ Growing Season Precipitation (in.)			Pndg	Pndg	Pndg									
Soil PAW (in.) to SD @ Planting			Pndg	Pndg	Pndg									
Total Plant Available Water (in.)			Pndg	Pndg	Pndg									
Soil NO3 (lbs.) to SD at Planting			Pndg	Pndg	Pndg									
Fertilizer Applied		(# N)	70.0	65.0	70.0	68.33								
		(# P_2O_5)	40.0	40.0	40.0	40.00								
		(# K_2O)	25.0	25.0	25.0	25.00								

Check Variety is Norstar

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

2/ P = Private Variety, + = Protected Variety

3/ 3-Yr Comparable Average = (x/y) * z where x = average yield or test weight of a given entry for years tested, y = average yield or test weight for Hector for the same years, and z = 3-Yr average yield or test weight for the check variety Norstar.

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

5/ Seeding to 14 days prior to harvest maturity.

TABLE 3. Dryland Fallow Spring Wheat Cultivar Evaluation Nursery Grown Off-Station at the Leon Cederberg Farm, Turner. Northern Agricultural Research Center. Havre, Montana. 2001. (Exp# 01-9951-SW)

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/ YIELD Bu/Ac	TEST WT Lbs/Bu	2/ PROTEIN %
PI531005	GRANDIN	95.5	24.2	42.9	62.5	15.9
PI574642	MCNEAL	95.1	22.4	42.6	60.6	15.6
PI549275	HI-LINE	92.7	22.4	42.6	61.2	15.2
CI 17430	NEWANA	95.5	20.1	41.6	61.9	14.8
PI592761	ERNEST (sawfly resistant)	94.1	22.5	41.0	62.4	15.9
ND 695	REEDER	95.5	22.1	40.1	62.4	16.0
PI527682	AMIDON (mod.sawfly resist.)	94.8	24.9	39.5	61.6	15.1
PI607557	SCHOLAR (mod.sawfly resist.)	95.8	24.8	38.8	62.0	16.0
WBEXPRS	WESTBRED EXPRESS	95.2	19.8	37.7	60.9	16.0
MT 9874	RGABC199/MT9312	95.8	21.4	37.3	60.3	15.0
CI 17429	LEW (sawfly resistant)	94.1	25.6	36.9	62.2	15.2
C982-324	RAMBO (mod.sawfly resistant)	95.5	21.5	36.8	62.3	15.0
MT 9929	MT9401/MT9328	94.4	20.9	36.4	61.8	16.0
MTHW9420	MT8182/MT8289 (hard white)	93.4	20.9	36.3	61.4	15.1
BZ992588	CONAN (sawfly tolerant)	94.8	21.8	36.0	62.0	15.7
WB 926	WESTBRED 926	93.1	21.2	35.5	61.1	15.9
WB 936	WESTBRED 936	96.2	21.2	35.2	61.8	16.1
MTHW9710	EXPLORER (hard white)	97.2	22.6	33.9	60.9	15.9
MTHW9904	MTHW9417/MT9311 (hrd wht)	95.1	21.8	29.0	63.1	15.4
CI 13596	FORTUNA (sawfly resistant)	93.7	26.4	25.6	61.9	15.7
EXPERIMENTAL MEANS		94.9	22.4	37.3	61.7	15.6
LSD (0.05)		2.6	2.0	7.1	0.3	.
C.V. 2: (S OF MEAN/MEAN)*100		1.0	3.1	6.6	0.2	.

1/ Volumetric yields are based on 60 lbs/bu as the standard test weight for wheat.
2/ Protein values are adjusted to 12 percent grain moisture.

TABLE 4. Ten-Year Yield and Test Weight Summary on Selected Entries from Dryland Fallow Spring Wheat Variety Nurseries Grown Off-Station at the Leon Cederberg Farm, Turner. Northern Agricultural Research Center. Havre, Montana. 1992-2001.

2/ VARIETY or SELECTION		No. of YEARS TESTED 3/	1/ YIELD (Bushels Per Acre) 1997	1998	1999 4/	2000	2001	AVE. for YEARS TESTED 3/	% of CHECK YIELD 5/	**10-YR COMP. AVE. YIELD 6/**	TEST WEIGHT (Pounds Per Bushel) 1997	1998	1999 4/	2000	2001	AVE. for YEARS TESTED 3/	% of CHECK TEST WT 5/	**10-YR COMP. AVE. TEST WT 6/**
PI574642	McNEAL	9	45.5	51.5		52.7	42.6	46.4	126.6	**46.4**	56.4	58.4		59.9	60.6	58.8	97.9	**58.8**
CI 17430	NEWANA	9	43.8	51.5		48.5	41.6	46.1	125.8	**46.1**	56.9	58.1		61.1	61.9	59.5	99.0	**59.5**
PI483235	GLENMAN (sawfly resis.)	7	41.5	47.6				46.2	123.9	**45.4**	55.9	56.5				57.6	96.3	**57.9**
PI527682	AMIDON (mod.swfly res.)	9	46.5	50.9		46.1	39.5	45.1	123.0	**45.1**	56.9	58.7		61.1	61.6	59.4	98.7	**59.4**
PI549275	HI-LINE	9	42.3	53.1		49.0	42.6	44.7	122.0	**44.7**	55.5	58.0		60.5	61.2	58.8	97.8	**58.8**
WBEXPRES	WB EXPRESS (P+)	6	42.6	49.2		48.6	37.7	43.6	120.4	**44.1**	56.4	58.1		60.3	60.9	59.2	97.9	**58.9**
WB 936	WB 936 (P+)	6	45.0	49.3		50.0	35.2	43.6	120.3	**44.1**	56.0	57.4		60.6	61.8	59.0	97.7	**58.8**
PI531005	GRANDIN	9	43.0	49.5		48.0	42.9	44.0	120.3	**44.0**	55.7	57.8		61.5	62.5	59.3	98.6	**59.3**
PNR 2375	PIONEER 2375	4	41.6	51.9				43.8	117.6	**43.1**	57.0	59.5				59.4	99.0	**59.5**
WPB 926R	WB 926R (P)	9	43.1	45.4		46.5	35.5	42.9	117.2	**42.9**	55.6	57.6		60.2	61.1	58.6	97.5	**58.6**
PI592761	ERNEST (+) (sawfly res.)	7	41.8	49.5		45.2	41.0	41.7	116.7	**42.7**	56.2	59.4		61.5	62.4	60.1	99.5	**59.8**
ND 582	STOA	7	44.4	43.9				42.4	113.7	**41.7**	55.3	57.6				57.7	96.5	**58.0**
C982-324	WB RAMBO (P+)(mod sf)	9	38.0	46.2		43.4	36.8	41.2	112.6	**41.2**	58.0	58.9		61.0	62.3	59.9	99.7	**59.9**
CI 17790	LEN	7	40.7	47.5				41.5	111.2	**40.7**	56.2	58.0				58.4	97.7	**58.8**
TR983239	WB FERGUS (P+)	5	44.1	44.4		49.5		42.6	111.1	**40.7**	56.4	58.1		60.5		59.1	98.2	**59.1**
PI607557	SCHOLAR(+)(mod.sf res)	5	45.9	50.8		47.3	38.8	42.3	110.3	**40.4**	58.5	59.5		61.8	62.0	60.5	100.1	**60.2**
MTHW9420	MT8182/MT8289 (hd wht)	5	42.2	51.2		49.6	36.3	41.3	107.7	**39.4**	55.4	57.7		60.3	61.4	59.0	97.7	**58.8**
CI 17429	LEW (sawfly resistant)	9	37.6	46.8		41.0	36.9	39.4	107.5	**39.4**	57.4	60.5		60.9	62.2	60.4	100.4	**60.4**
ND 673	TRENTON	3	41.9	44.9				37.5	106.0	**38.8**	56.2	58.5				58.6	97.9	**58.9**
CI 13596	FORTUNA (sawfly resis.)	9	36.8	42.1		43.0	25.6	36.6	100.0	**36.6**	56.9	60.6		60.7	61.9	60.1	100.0	**60.1**
MEANS (For Entries Listed)			42.4	48.4		47.2	38.1			42.4	56.4	58.4		60.8	61.7			59.2
7/ Growing Season Precipitation (in.)			10.48	Pndg		Pndg	Pndg	7.35										
Soil PAW (in.) to SD @ Planting			4.87	Pndg		Pndg	Pndg	5.93										
Total Plant Available Water (in.)			15.35	Pndg		Pndg	Pndg	13.28										
Soil NO3 (lbs.) to SD at Planting			60	Pndg		Pndg	Pndg	60.00										
SD (Sampling Depth in Inches)			48	48		48.0	48.0	48.00										
Fertilizer Applied	(# N)		66.0	66.0		70.0	70.0	66.89										
	(# P_2O_5)		33.0	33.0		40.0	40.0	35.56										
	(# K_2O)		0.0	0.0		25.0	25.0											

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 cultivar selecton decisions.

2/ P = Private Variety, + = Protected Variety

3/ Only the most recent 5 years are shown, but summary calculations include all years noted.

4/ Nursery not planted due to wet conditions extending throughout and beyond the normal seeding period for this location.

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

6/ 10-Yr Comparable Average = (x/y) * z where x = average yield or test weight of a given 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.

7/ Seeding to 14 days prior to harvest maturity.

TABLE 5. Dryland Fallow Spring Wheat Cultivar Evaluation Nursery Grown Off-Station at the Flansaas/Lumsden Farm, Loring. Northern Agricultural Research Center. Havre, Montana. 2001. (Exp# 01-9955-SW)

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/ YIELD Bu/Ac	TEST WT Lbs/Bu	2/ PROTEIN %
MT 9874	RGABC199/MT9312	95.5	25.6	44.0	60.0	15.1
PI549275	HI-LINE	91.0	22.9	43.3	60.9	15.4
ND 695	REEDER	94.1	25.7	42.0	61.7	15.9
CI 17430	NEWANA	94.5	24.1	40.6	61.3	14.8
WB 936	WESTBRED 936	93.4	23.0	40.6	60.4	16.0
PI527682	AMIDON (mod.sawfly resist.)	93.0	28.6	40.4	61.1	15.3
PI574642	MCNEAL	93.4	24.9	39.3	59.9	15.4
MTHW9904	MTHW9417/MT9311 (hrd wht)	93.1	25.7	39.0	62.4	15.5
BZ992588	CONAN (sawfly tolerant)	91.0	23.5	39.0	61.4	16.0
PI531005	GRANDIN	92.4	27.3	38.6	61.3	16.1
PI592761	ERNEST (sawfly resistant)	92.7	27.4	38.2	61.8	16.1
WBEXPRS	WESTBRED EXPRESS	93.8	22.2	38.0	60.2	15.6
MT 9929	MT9401/MT9328	93.1	23.2	37.6	60.3	16.0
C982-324	RAMBO (mod.sawfly resistant)	93.8	24.3	37.2	61.5	15.1
PI607557	SCHOLAR (mod.sawfly resist.)	93.1	26.4	36.5	61.6	16.1
WB 926	WESTBRED 926	88.6	24.8	36.4	60.1	16.0
MTHW9710	EXPLORER (hard white)	94.8	23.9	36.2	60.5	15.8
MTHW9420	MT8182/MT8289 (hard white)	92.0	23.9	35.7	60.9	15.1
CI 17429	LEW (sawfly resistant)	93.4	29.9	35.6	61.9	15.6
CI 13596	FORTUNA (sawfly resistant)	92.7	27.6	32.8	61.7	15.7
EXPERIMENTAL MEANS		93.0	25.2	38.6	61.0	15.6
LSD (0.05)		3.3	2.4	5.0	0.7	.
C.V. 2: (S OF MEAN/MEAN)*100		1.3	3.4	4.5	0.4	.

1/ Volumetric yields are based on 60 lbs/bu as the standard test weight for wheat.
2/ Protein values are adjusted to 12 percent grain moisture.

TABLE 6. Six-Year Yield and Test Weight Summary on Selected Entries from Dryland Fallow Spring Wheat Variety Nurseries Grown Off-Station at the Flansaas/Lumsden Farm, Loring. Northern Agricultural Research Center. Havre, Montana. 1996-2001.

2/ VARIETY or SELECTION		No. of YEARS TESTED 3/	1/ YIELD (Bushels Per Acre) 1997	1998	1999	2000	2001	AVE. for YEARS TESTED 3/	% of CHECK YIELD 4/	**6-YR COMP. AVE. YIELD 5/**	TEST WEIGHT (Pounds Per Bushel) 1997	1998	1999	2000	2001	AVE. for YEARS TESTED 3/	% of CHECK TEST WT 4/	**6-YR COMP. AVE. TEST WT 5/**
ND 695	REEDER (+)	3			49.4	41.2	42.0	44.2	131.2	**39.0**			60.1	62.1	61.7	61.3	101.6	**60.1**
PI574642	McNEAL	6	35.2	31.7	47.0	42.8	39.3	37.4	126.0	**37.4**	55.4	54.2	59.1	59.7	59.9	58.0	98.1	**58.0**
CI 17430	NEWANA	6	35.9	28.2	47.7	41.7	40.6	37.4	125.8	**37.4**	56.8	52.7	58.8	61.3	61.3	58.7	99.3	**58.7**
PI549275	HI-LINE	6	32.7	29.5	45.3	40.0	43.3	36.5	122.9	**36.5**	55.1	51.6	58.2	60.9	60.9	57.9	97.8	**57.9**
WB 936	WB 936 (P+)	6	37.9	30.1	42.6	40.4	40.6	36.4	122.6	**36.4**	56.6	52.8	58.0	60.6	60.4	58.2	98.3	**58.2**
PI527682	AMIDON (mod.swfly res.)	6	36.1	26.9	45.3	38.9	40.4	36.2	121.7	**36.2**	57.5	54.9	57.6	61.2	61.1	58.9	99.5	**58.9**
PI531005	GRANDIN	6	35.4	29.8	44.9	41.2	38.6	36.1	121.6	**36.1**	56.3	51.8	58.2	61.3	61.3	58.4	98.6	**58.4**
PI607557	SCHOLAR (+)(mod.sf res)	6	35.3	31.4	45.4	37.7	36.5	35.8	120.6	**35.8**	58.5	57.3	59.0	61.6	61.6	60.0	101.3	**60.0**
WBEXPRES	WB EXPRESS (P+)	6	31.2	30.5	47.8	37.4	38.0	35.4	119.3	**35.4**	55.9	54.3	58.8	59.9	60.2	58.2	98.4	**58.2**
TR983239	WB FERGUS (P+)	5	34.6	28.8	45.1	38.8		34.6	118.8	**35.3**	56.6	54.6	59.0	60.3		58.5	99.7	**59.0**
BZ992588	CONAN (P+) (sawfly tol)	3			43.0	37.7	39.0	39.9	118.4	**35.2**			60.6	61.0	61.4	61.0	101.1	**59.8**
PNR 2375	PIONEER 2375	4	34.7	29.2	39.2			32.7	117.3	**34.8**	56.8	54.7	58.2			57.7	99.3	**58.8**
PI592761	ERNEST (+) (sawfly res.)	6	34.8	27.3	40.4	38.1	38.2	34.3	115.5	**34.3**	57.1	54.8	57.7	61.4	61.8	59.0	99.8	**59.0**
MTHW9420	MT8182/MT8289 (hrd wht)	6	33.6	29.7	40.1	39.2	35.7	34.2	115.2	**34.2**	55.8	53.3	58.0	60.4	60.9	58.2	98.4	**58.2**
WPB 926R	WB 926R (P)	6	34.1	28.1	38.5	40.4	36.4	33.9	114.0	**33.9**	56.2	53.6	57.7	60.1	60.1	58.1	98.2	**58.1**
C982-324	WB RAMBO (P+) (mod sf)	6	27.8	27.4	44.0	38.5	37.2	33.6	113.0	**33.6**	57.6	56.6	59.5	61.2	61.5	59.7	100.8	**59.7**
PI483235	GLENMAN (sawfly resis.)	3	33.8	23.9				28.8	112.1	**33.3**	56.1	52.6				55.8	96.2	**56.9**
ND 582	STOA	3	32.8	27.0				28.8	111.9	**33.3**	55.1	53.5				56.2	96.8	**57.3**
CI 17790	LEN	3	31.4	27.2				28.5	110.8	**32.9**	55.4	52.8				56.5	97.3	**57.6**
ND 673	TRENTON	3	33.4	25.5				28.3	109.9	**32.6**	56.8	54.2				57.2	98.6	**58.4**
CI 17429	LEW (sawfly resistant)	6	30.7	24.7	38.4	35.1	35.6	31.9	107.5	**31.9**	57.1	56.5	59.7	61.3	61.9	59.6	100.7	**59.6**
CI 13596	FORTUNA (sawfly resis.)	6	29.7	24.5	34.4	33.9	32.8	29.7	100.0	**29.7**	57.6	55.3	58.2	61.1	61.7	59.2	100.0	**59.2**
MEANS (For Entries Listed)			33.6	28.1	43.3	39.0	38.4			34.8	56.5	54.1	58.7	60.9	61.1			58.6
6/ Growing Season Precipitation (in.)			7.36	5.20	Pndg	Pndg	Pndg	5.25										
Soil PAW (in.) to SD @ Planting			5.55	6.30	Pndg	Pndg	Pndg	5.70										
Total Plant Available Water (in.)			12.91	11.50	Pndg	Pndg	Pndg	10.95										
Soil NO3 (lbs.) to SD at Planting			40.0	130.0	Pndg	Pndg	Pndg	70.00										
SD (Sampling Depth in Inches)			48.0	48.0	48.0	48.0	48.0	48.00										
Fertilizer Applied	(# N)		90.0	70.0	70.0	70.0	70.0	71.17										
	(# P_2O_5)		48.0	40.0	40.0	40.0	40.0	39.33										
	(# K_2O)		21.0	25.0	25.0	25.0	25.0	20.17										

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 cultivar selecton decisions.

2/ P = Private Variety, + = Protected Variety

3/ Only the most recent 5 years are shown, but summary calculations include all years noted.

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

5/ 6-Yr Comparable Average = (x/y) * z where x = average yield or test weight of a given entry for years tested, y = average yield or test weight for Fortuna for the same years, and z = 6-Yr average yield or test weight for the check variety Fortuna.

6/ Seeding to 14 days prior to harvest maturity.

TABLE 7. Dryland Fallow Spring Wheat Cultivar Evaluation Nursery Grown Off-Station in a Wheat Stem Sawfly Environment at McKeever Farm & Seed, Inc., Loma. Northern Agricultural Research Center. Havre, Montana. 2001. (Exp# 01-9957-SW)

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/ YIELD Bu/Ac	TEST WT Lbs/Bu	2/ PROTEIN %
PI574642	MCNEAL	94.7	17.5	9.2	53.4	20.8
MTHW9710	EXPLORER (hard white)	96.4	15.6	9.2	53.5	21.5
PI549275	HI-LINE	92.5	18.0	9.1	51.6	20.6
MT 9874	RGABC199/MT9312	95.8	16.3	9.0	53.4	20.6
PI527682	AMIDON	94.4	17.7	9.0	54.3	20.5
C982-324	RAMBO (mod.sawfly resistant)	95.0	17.2	8.9	56.1	20.1
PI592761	ERNEST (sawfly resistant)	96.4	18.8	8.6	54.7	21.1
CI 17430	NEWANA	95.0	15.9	8.4	55.7	19.7
PI531005	GRANDIN	95.0	17.1	8.3	52.7	19.6
PI607557	SCHOLAR (mod.sawfly resist.)	93.9	17.3	8.0	55.6	20.3
CI 13596	FORTUNA (sawfly resistant)	94.1	18.4	7.7	54.0	19.5
WB 926	WESTBRED 926	92.8	16.5	7.6	53.0	21.4
CI 17429	LEW (sawfly resistant)	95.0	17.3	7.6	53.9	20.7
MT 9929	MT9401/MT9328	93.3	14.8	7.4	53.4	20.4
MTHW9904	MTHW9417/MT9311 (hrd wht)	93.3	18.0	7.2	57.0	19.1
ND 695	REEDER	95.0	15.4	7.1	53.6	20.5
BZ992588	CONAN (sawfly tolerant)	94.4	15.9	7.1	56.7	19.4
MTHW9420	MT8182/MT8289 (hard white)	93.9	17.1	6.7	51.9	20.2
WB 936	WESTBRED 936	95.8	16.0	6.6	52.9	20.7
WBEXPRS	WESTBRED EXPRESS	93.1	14.8	6.5	54.2	20.5
EXPERIMENTAL MEANS		94.5	16.8	8.0	54.1	20.4
LSD (0.05)		2.8	1.6	1.6	1.3	.
C.V. 2: (S OF MEAN/MEAN)*100		1.0	3.4	7.1	0.8	.

1/ Volumetric yields are based on 60 lbs/bu as the standard test weight for wheat.
2/ Protein values are adjusted to 12 percent grain moisture.

TABLE 8. Four-Year Yield and Test Weight Summary on Selected Entries from Dryland Fallow Spring Wheat Variety Nurseries Grown Off-Station in a Wheat Stem Sawfly Environment at McKeever Farm & Seed, Inc., Loma. Northern Agricultural Research Center. Havre, Montana. 1998-2001.

2/ VARIETY or SELECTION		No. of YEARS TESTED 3/	1/ YIELD (Bushels Per Acre) 1998	1999	2000	2001	AVE. for YEARS TESTED	% of CHECK YIELD 4/	**4-YR COMP. AVE. YIELD 5/**	TEST WEIGHT (Pounds Per Bushel) 1998	1999	2000	2001	AVE. for YEARS TESTED	% of CHECK TEST WT 4/	**4-YR COMP. AVE. TEST WT 5/**
WPB 926R	WB 926R (P)	3	34.4		32.1	7.6	24.7	113.5	**27.5**	47.9		55.3	53.0	52.1	96.6	**52.2**
PI574642	McNEAL	4	33.6	35.7	29.8	9.2	27.1	111.8	**27.1**	47.0	52.2	53.1	53.4	51.4	95.2	**51.4**
ND 695	REEDER (+)	3		34.2	30.4	7.1	23.9	109.6	**26.6**		55.5	55.9	53.6	55.0	100.6	**54.3**
PI527682	AMIDON (mod.swfly res.)	4	30.9	37.0	28.5	9.0	26.4	108.7	**26.4**	51.1	53.7	55.7	54.3	53.7	99.5	**53.7**
PI607557	SCHOLAR (+)(mod.sf res)	4	33.0	34.8	28.5	8.0	26.1	107.6	**26.1**	50.9	54.7	56.3	55.6	54.4	100.7	**54.4**
BZ992588	CONAN (P+) (sawfly tol)	3		36.7	26.0	7.1	23.3	106.7	**25.9**		55.3	56.7	56.7	56.2	102.8	**55.5**
PI549275	HI-LINE	4	32.3	30.7	27.3	9.1	24.9	102.6	**24.9**	45.6	53.0	54.2	51.6	51.1	94.6	**51.1**
CI 17430	NEWANA	4	26.9	37.3	25.3	8.4	24.5	101.0	**24.5**	44.9	54.8	55.0	55.7	52.6	97.4	**52.6**
PI592761	ERNEST (+) (sawfly res.)	4	30.2	29.9	28.3	8.6	24.3	100.0	**24.3**	50.4	53.3	56.8	54.7	53.8	99.6	**53.8**
CI 13596	FORTUNA (sawfly resis.)	4	31.5	31.7	26.1	7.7	24.2	100.0	**24.2**	51.9	54.4	55.7	54.0	54.0	100.0	**54.0**
C982-324	WB RAMBO (P+) (mod sf)	4	25.8	34.1	27.5	8.9	24.1	99.3	**24.1**	48.2	54.8	57.0	56.1	54.0	100.0	**54.0**
MTHW9420	MT8182/MT8289 (hrd wht)	3		26.7	25.9	6.7	19.8	90.5	**21.9**		51.4	53.8	51.9	52.4	95.7	**51.7**
CI 17429	LEW (sawfly resistant)	4	27.6	29.8	21.8	7.6	21.7	89.5	**21.7**	50.9	54.4	54.6	53.9	53.4	99.0	**53.4**
MEANS (For Entries Listed)			30.6	33.2	27.5	8.1			25.0	48.9	54.0	55.4	54.2			53.2
6/ Growing Season Precipitation (in.)			Pndg	Pndg	Pndg	Pndg										
Soil PAW (in.) to SD @ Planting			Pndg	Pndg	Pndg	Pndg										
Total Plant Available Water (in.)			Pndg	Pndg	Pndg	Pndg										
Soil NO3 (lbs.) to SD at Planting			Pndg	Pndg	Pndg	Pndg										
SD (Sampling Depth in Inches)			48.0	48.0	48.0											
Fertilizer Applied	(# N)		70.0	70.0	65.0	70.0	68.75									
	(# P_2O_5)		40.0	40.0	40.0	40.0	40.00									
	(# K_2O)		25.0	25.0	25.0	25.0	25.00									

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 cultivar selection decisions.

2/ P = Private Variety, + = Protected Variety

3/ Research is being conducted at this location is to evaluate varieties and breeding materials in the presence of wheat stem sawfly. Sawfly pressure was weak in 1998, but was significant in 1999-2001. Hail damage at the location confounded studies in 1999. Heat and drought stress was prevalent at critical growth stages during all four years. The plot combine was equipped with pick-up guards similar to those commonly used on full-scale combines for straight-cut harvest under sawfly damage conditions.

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

5/ 4-Yr Comparable Average = (x/y) * z where x = average yield or test weight of a given entry for years tested, y = average yield or test weight for Fortuna for the same years, and z = 4-Yr average yield or test weight for the check variety Fortuna.

6/ Seeding to 14 days prior to harvest maturity.

TABLE 9. Dryland Fallow Barley Cultivar Evaluation Nursery Grown Off-Station at the Leon Cederberg Farm, Turner. Northern Agricultural Research Center. Havre, Montana. 2001. (Exp# 01-3651-SB)

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/ YIELD Bu/Ac	TEST WT Lbs/Bu	PLUMP %	THIN %	2/ PROTEIN %
PI568246	BARONESSE	94.8	16.1	57.9	52.1	81.9	7.2	16.3
BZ594-19	XENA	94.5	18.9	49.3	52.7	80.9	8.9	15.6
MTLB 13	MTLB 13	94.5	14.9	48.1	51.7	54.7	19.6	17.2
ND13299	CONLON	95.5	15.9	47.8	45.0	62.5	14.0	16.1
MTLB 5	MTLB 5	94.8	17.7	47.0	52.2	49.0	20.7	17.3
MT960100	MT960100	93.8	16.4	46.1	51.4	48.7	26.4	16.9
MT960228	MT960228	96.2	16.8	44.0	53.3	77.7	7.8	16.3
PI491534	GALLATIN	95.5	18.9	43.9	51.8	45.7	27.8	16.2
H3860224	H3860224	88.9	17.4	42.2	51.1	71.7	14.1	17.6
MT960099	MT960099	94.8	17.1	42.2	50.4	33.0	36.6	17.3
ND 9866	STARK	92.7	18.0	40.9	52.9	81.6	8.9	16.5
PI610264	VALIER	94.5	16.8	40.8	51.7	43.4	24.1	16.8
CI 15856	LEWIS	95.1	17.0	38.0	50.6	40.8	32.1	18.1
MT970116	MT970116	93.1	18.7	38.0	51.2	53.1	23.2	16.9
SK 76333	HARRINGTON	95.2	18.1	33.9	48.0	30.5	41.1	18.0
MT950186	MT950186	94.1	15.4	33.5	54.1	79.5	7.0	16.0
EXPERIMENTAL MEANS		94.2	17.1	43.3	51.3	58.4	20.0	16.8
LSD (0.05)		2.2	2.7	12.2	5.2	.	.	.
CV2: (S OF MEAN/MEAN)*100		0.8	5.5	9.8	3.5	.	.	.

1/ Volumetric yields are based on 48 lbs/bu as the standard test weight for barley.
2/ Protein values are reported on a 100% dry matter basis.

TABLE 10. Ten-Year Yield and Test Weight Summary on Selected Entries from Dryland Fallow Barley Variety Nurseries Grown Off-Station at the Leon Cederberg Farm, Turner. Northern Agricultural Research Center. Havre, Montana. 1992-2001.

2/ VARIETY or SELECTION		No. of YEARS TESTED 3/	1/ YIELD (Bushels Per Acre) 1997	1998	1999 4/	2000	2001	AVE. for YEARS TESTED 3/	% of CHECK YIELD 5/	**10-YR COMP. AVE. YIELD 6/**	TEST WEIGHT (Pounds Per Bushel) 1997	1998	1999 4/	2000	2001	AVE. for YEARS TESTED 3/	% of CHECK TEST WT 5/	**10-YR COMP. AVE. TEST WT 6/**
NS 78054	BARONESSE (P+)	9	56.7	74.1		81.2	57.9	68.4	117.7	**68.4**	46.5	49.3		52.9	52.1	49.2	98.5	**49.2**
MTLB 5	MTLB 5	3		77.3		74.1	47.0	66.1	108.2	**62.9**		52.0		53.5	52.2	52.6	100.6	**50.3**
PI483237	BOWMAN	8	65.1	69.8		61.6		61.8	103.1	**59.9**	51.3	52.0		53.7		50.7	102.0	**51.0**
N1123111	LOGAN (+)	3	64.4	66.4				56.6	101.9	**59.2**	50.4	51.3				50.1	101.6	**50.7**
ND 9866	STARK	9	62.8	75.0		51.6	40.9	58.9	101.3	**58.9**	49.9	52.4		54.1	52.9	51.2	102.4	**51.2**
PI491534	GALLATIN	9	59.4	70.7		68.7	43.9	58.1	100.0	**58.1**	48.5	51.0		53.9	51.8	50.0	100.0	**50.0**
PI591823	CHINOOK (+)	8	54.8	68.7		72.1		59.8	99.8	**58.0**	47.7	51.3		53.4		49.1	98.7	**49.3**
SK 76333	HARRINGTON	9	57.0	72.5		68.4	33.9	57.9	99.6	**57.9**	47.2	48.7		52.9	48.0	48.0	96.1	**48.0**
CI 15514	HECTOR	8	54.4	64.6		68.9		58.6	97.9	**56.9**	49.1	51.5		54.3		49.4	99.4	**49.7**
CI 15856	LEWIS	9	54.9	66.6		73.5	38.0	55.5	95.6	**55.5**	48.4	52.3		54.9	50.6	50.2	100.4	**50.2**
MEANS (For Entries Listed)			58.8	70.6		68.9	43.6			59.6	48.8	51.2		53.7	51.3			50.0
7/ Growing Season Precipitation (in.)			9.88	Pndg		Pndg	Pndg											
Soil PAW (in.) to SD @ Planting			3.96	Pndg		Pndg	Pndg											
Total Plant Available Water (in.)			13.84	Pndg		Pndg	Pndg											
Soil NO3 (lbs.) to SD at Planting			60	Pndg		Pndg	Pndg											
SD (Sampling Depth in Inches)			48	48		48	48	48.00										
Fertilizer Applied		(# N)	66	66		70	70	66.89										
		(# P_2O_5)	33	33		40	40	35.56										
		(# K_2O)	21	25		25	25											

Check Variety is Gallatin

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

2/ P = Private Variety, + = Protected Variety

3/ Only the most recent 5 years are shown, but summary calculations include all years noted.

4/ Nursery not planted due to wet conditions extending throughout and beyond the normal seeding period for this location.

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

6/ 10-Yr Comparable Average = (x/y) * z where x = average yield or test weight of a given entry for years tested, y = average yield or test weight for Gallatin for the same years, and z = 10-Yr average yield or test weight for the check variety Gallatin.

7/ Seeding to 14 days prior to harvest maturity.

TABLE 11. Dryland Fallow Barley Cultivar Evaluation Nursery Grown Off-Station at the Flanaas/ Lumsden Farm, Loring. Northern Agricultural Research Center. Havre, Montana. 2001. (Exp# 01-3655-SB)

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/ YIELD Bu/Ac	TEST WT Lbs/Bu	PLUMP %	THIN %	2/ PROTEIN %
BZ594-19	XENA	91.7	21.4	59.1	52.1	90.4	2.8	14.5
PI568246	BARONESSE	94.5	21.6	57.8	51.3	83.9	5.3	15.1
MT960100	MT960100	94.4	18.6	57.3	52.1	73.9	8.2	15.8
MTLB 5	MTLB 5	96.2	21.7	57.2	52.5	74.3	7.0	16.3
ND13299	CONLON	94.5	22.7	55.2	51.3	82.7	5.1	14.9
MTLB 13	MTLB 13	92.7	20.8	54.9	51.1	75.0	8.5	15.7
MT950186	MT950186	94.5	21.2	54.7	53.4	88.1	3.0	14.7
PI491534	GALLATIN	93.1	23.4	54.4	52.2	80.9	5.2	15.4
MT960099	MT960099	92.7	18.2	53.5	51.0	60.1	12.9	15.6
SK 76333	HARRINGTON	95.8	20.4	53.0	50.6	85.3	4.7	15.9
CI 15856	LEWIS	95.5	21.6	51.5	52.3	82.5	5.5	15.9
PI610264	VALIER	94.1	21.4	51.4	52.4	72.5	7.3	15.9
MT960228	MT960228	95.5	20.1	51.2	51.6	77.7	6.2	15.3
H3860224	H3860224	89.6	21.7	47.2	51.4	86.2	5.1	16.7
MT970116	MT970116	91.7	22.4	46.3	53.7	93.2	2.4	15.4
ND 9866	STARK	90.6	23.2	45.5	53.4	92.4	3.1	14.9
EXPERIMENTAL MEANS		93.6	21.3	53.1	52.0	81.2	5.8	15.5
LSD (0.05)		3.1	2.6	12.3	0.5	.	.	.
CV2: (S OF MEAN/MEAN)*100		1.1	4.2	8.0	0.3	.	.	.

1/ Volumetric yields are based on 48 lbs/bu as the standard test weight for barley.
2/ Protein values are reported on a 100% dry matter basis.

TABLE 12. Six-Year Yield and Test Weight Summary of Selected Entries from Dryland Fallow Barley Variety Nurseries Grown Off-Station at the Flansaas/Lumsden Farm, Loring. Northern Agricultural Research Center. Havre, Montana. 1996-2001.

2/ VARIETY or SELECTION		No. of YEARS TESTED 3/	1/ YIELD (Bushels Per Acre) 1997	1998	1999	2000	2001	AVE. for YEARS TESTED 3/	% of CHECK YIELD 4/	**6-YR COMP. AVE. YIELD 5/**	TEST WEIGHT (Pounds Per Bushel) 1997	1998	1999	2000	2001	AVE. for YEARS TESTED 3/	% of CHECK TEST WT 4/	**6-YR COMP. AVE. TEST WT 5/**
BZ594-19	WPB XENA (P+)	3			77.3	51.4	59.1	62.6	107.3	**55.0**			49.2	51.1	52.1	50.8	97.8	**48.7**
NS 78054	BARONESSE (P+)	6	47.6	46.9	79.5	56.7	57.8	54.4	106.2	**54.4**	46.9	44.6	49.4	50.8	51.3	48.5	97.4	**48.5**
MT950186	MT950186	3			74.9	54.8	54.7	61.5	105.4	**54.0**			52.5	53.7	53.4	53.2	102.5	**51.0**
MT960228	MT960228	3			74.6	56.1	51.2	60.6	103.9	**53.3**			51.0	51.6	51.6	51.4	99.0	**49.3**
MTLB 13	MTLB 13	3			73.9	52.1	54.9	60.3	103.4	**53.0**			50.1	51.2	51.1	50.8	97.8	**48.7**
MTLB 5	MTLB 5	4		44.4	73.0	52.7	57.2	56.8	103.2	**52.9**		47.1	50.9	52.3	52.5	50.7	100.7	**50.1**
PI610264	VALIER (+)	3			73.2	54.8	51.4	59.8	102.5	**52.6**			50.6	52.3	52.4	51.8	99.7	**49.6**
PI491534	GALLATIN	6	49.5	45.1	69.4	51.2	54.4	51.3	100.0	**51.3**	48.9	45.7	51.7	51.9	52.2	49.8	100.0	**49.8**
N1123111	LOGAN (+)	3	50.3	43.7				43.9	99.4	**50.9**	50.5	46.3				48.0	100.7	**50.2**
CI 15856	LEWIS	6	48.4	34.9	70.0	58.2	51.5	50.3	98.2	**50.3**	49.0	47.3	51.7	52.4	52.3	50.3	100.9	**50.3**
PI591823	CHINOOK (+)	5	47.1	41.1	64.8	53.0		49.0	96.7	**49.6**	48.6	46.7	52.0	51.7		49.2	99.7	**49.7**
CI 15514	HECTOR	5	43.0	38.4	69.6	52.9		48.6	96.1	**49.3**	48.6	45.9	51.3	52.2		49.3	100.0	**49.8**
SK 76333	HARRINGTON	6	44.6	37.7	69.0	52.8	53.0	48.9	95.5	**48.9**	48.3	45.6	49.6	50.9	50.6	48.7	97.9	**48.7**
PI483237	BOWMAN	5	40.1	39.1	67.7	46.7		46.0	90.9	**46.6**	50.2	47.2	52.0	52.6		50.4	102.1	**50.9**
ND 9866	STARK	6	38.1	43.2	60.8	44.2	45.5	44.8	87.5	**44.8**	50.2	46.4	50.9	53.2	53.4	50.6	101.6	**50.6**
MEANS (For Entries Listed)			45.4	41.4	71.3	52.7	53.7			51.1	49.0	46.3	50.9	52.0	52.1			49.7
6/ Growing Season Precipitation (in.)			6.79	5.20	Pndg	Pndg	Pndg											
Soil PAW (in.) to SD @ Planting			5.55	6.30	Pndg	Pndg	Pndg											
Total Plant Available Water (in.)			12.34	11.50	Pndg	Pndg	Pndg											
Soil NO3 (lbs.) to SD at Planting			40.0	130.0	Pndg	Pndg	Pndg											
SD (Sampling Depth in Inches)			48.0	48.0	48.0	48.0		48.00										
Fertilizer Applied	(# N)		90.0	70.0	70.0	70.0	70.0	71.17										
	(# P_2O_5)		48.0	40.0	40.0	40.0	40.0	39.33										
	(# K_2O)		21.0	25.0	25.0	25.0	25.0	20.17										

Check Variety is Gallatin

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

2/ P = Private Variety, + = Protected Variety

3/ Only the most recent 5 years are shown, but summary calculations include all years noted.

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

5/ 6-Yr Comparable Average = (x/y) * z where x = average yield or test weight of a given entry for years tested, y = average yield or test weight for Gallatin for the same years, and z = 6-Yr average yield or test weight for the check variety Gallatin.

6/ Seeding to 14 days prior to harvest maturity.

TABLE 13. Dryland Fallow Barley Cultivar Evaluation Nursery Grown Off-Station in a Wheat Stem Sawfly Environment at McKeever Farm & Seed, Inc., Loma. Northern Agricultural Research Center. Havre, Montana. 2001. (Exp# 01-3657-SB)

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/ YIELD Bu/Ac	TEST WT Lbs/Bu	PLUMP %	THIN %	2/ PROTEIN %
ND 9866	STARK	90.0	17.5	14.6	45.8	8.3	54.2	20.9
MT950186	MT950186	90.3	14.8	13.1	47.2	4.6	59.7	23.2
CI 15856	LEWIS	93.1	14.8	12.7	45.5	10.3	63.3	23.0
PI491534	GALLATIN	91.1	14.7	12.7	44.1	8.8	65.0	23.8
PI568246	BARONESSE	91.9	13.6	11.3	45.4	19.7	42.1	24.3
MT960228	MT960228	95.0	14.6	11.3	46.3	4.9	62.5	23.1
MT970116	MT970116	92.5	16.7	11.2	47.0	12.0	51.6	22.9
ND13299	CONLON	94.5	14.5	11.0	42.5	10.5	68.0	23.2
BZ594-19	XENA	90.0	16.2	10.9	46.1	22.3	36.6	22.5
H3860224	H3860224	83.9	15.9	10.8	45.3	20.8	55.6	25.3
SK 76333	HARRINGTON	93.9	13.5	10.3	44.7	14.4	57.5	23.5
MTLB 13	MTLB 13	91.4	14.3	10.2	45.2	1.5	82.4	24.1
MT960099	MT960099	90.0	12.0	9.6	44.3	0.6	92.5	24.7
PI610264	VALIER	91.9	14.3	8.3	47.7	4.1	73.2	24.3
MT960100	MT960100	90.8	13.3	7.3	46.5	3.1	76.3	25.1
MTLB 5	MTLB 5	94.5	12.9	5.8	46.9	2.2	80.1	24.6
EXPERIMENTAL MEANS		91.6	14.6	10.7	45.6	9.3	63.8	23.7
LSD (0.05)		3.6	2.4	4.8	1.0	.	.	.
CV2: (S OF MEAN/MEAN)*100		1.4	5.7	15.5	0.8	.	.	.

1/ Volumetric yields are based on 48 lbs/bu as the standard test weight for barley.
2/ Protein values are reported on a 100% dry matter basis.

TABLE 14. Three-Year Yield and Test Weight Summary of Selected Entries from Dryland Fallow Barley Variety Nurseries Grown Off-Station at McKeever Farm & Seed, Inc., Loma Northern Agricultural Research Center. Havre, Montana. 1999-2001.

2/ VARIETY or SELECTION		No. of YEARS TESTED	1/ YIELD (Bushels Per Acre) 1999	2000	2001	AVE. for YEARS TESTED	% of CHECK YIELD 3/	**3-YR COMP. AVE. YIELD 4/**	TEST WEIGHT (Pounds Per Bushel) 1999	2000	2001	AVE. for YEARS TESTED	% of CHECK TEST WT 3/	**3-YR COMP. AVE. TEST WT 4/**
MT950186	MT950186	3	54.8	44.1	13.1	37.3	104.0	**37.3**	52.6	47.7	47.2	49.1	104.8	**49.1**
MT960228	MT960228	3	56.3	43.2	11.3	36.9	102.9	**36.9**	49.4	47.2	46.3	47.6	101.6	**47.6**
PI491534	GALLATIN	3	48.9	46.0	12.7	35.9	100.0	**35.9**	50.6	45.4	44.1	46.7	99.6	**46.7**
ND 9866	STARK	3	41.0	50.1	14.6	35.2	98.1	**35.2**	50.8	49.4	45.8	48.6	103.8	**48.6**
MTLB 13	MTLB 13	3	47.3	43.4	10.2	33.6	93.7	**33.6**	49.9	44.5	45.2	46.6	99.3	**46.6**
SK 76333	HARRINGTON	3	48.4	42.1	10.3	33.6	93.6	**33.6**	48.6	44.6	44.7	46.0	98.1	**46.0**
NS 78054	BARONESSE (P+)	3	42.7	46.7	11.3	33.6	93.6	**33.6**	50.6	44.9	45.4	47.0	100.2	**47.0**
BZ594-19	WPB XENA (P+)	3	42.7	42.4	10.9	32.0	89.2	**32.0**	49.6	45.9	46.1	47.2	100.6	**47.2**
CI 15856	LEWIS	3	43.3	39.0	12.7	31.7	88.3	**31.7**	51.3	46.3	45.5	47.7	101.7	**47.7**
PI610264	VALIER (+)	3	46.2	33.8	8.3	29.4	82.0	**29.4**	49.9	46.1	47.7	47.9	102.1	**47.9**
MTLB 5	MTLB 5	3	42.3	39.1	5.8	29.1	81.0	**29.1**	50.9	46.3	46.9	48.0	102.5	**48.0**
MEANS (For Entries Listed)			46.7	42.7	11.0			33.5	50.4	46.2	45.9			47.5
5/ Growing Season Precipitation (in.)			Pndg	Pndg	Pndg									
Soil PAW (in.) to SD @ Planting			Pndg	Pndg	Pndg									
Total Plant Available Water (in.)			Pndg	Pndg	Pndg									
Soil NO3 (lbs.) to SD at Planting			Pndg	Pndg	Pndg									
SD (Sampling Depth in Inches)			48.0	48.0		48.00								
Fertilizer Applied		(# N)	70.0	65.0	70.0	68.33								
		(# P_2O_5)	40.0	40.0	40.0	40.00								
		(# K_2O)	25.0	25.0	25.0	25.00								

Check Variety is Gallatin

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

2/ P = Private Variety, + = Protected Variety

3/ Percent of Gallatin yield or test weight for the same data years as those in which a given entry was tested.

4/ 6-Yr Comparable Average = (x/y) * z where x = average yield or test weight of a given entry for years tested, y = average yield or test weight for Gallatin for the same years, and z = 6-Yr average yield or test weight for the check variety Gallatin.

5/ Seeding to 14 days prior to harvest maturity.