

**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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**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 1997-2001 statewide total (33% 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.

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. An abridged version of such 'base data' is included in this report for each trial at each location.

**RESULTS:**

Data details for individual trials conducted from 1983-2001 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 2002 ranged from extremely poor to good across North Central Montana. At Havre, total annual growing season precipitation (9/1/01 through 8/31/02) was 13.29 inches, over 10 percent greater than the average for all years since 1916. April 1 through July 31 precipitation was 8.87 inches or 131 percent of the 87-year average. Heat units expressed as "Growing Degree Days" (GDD, base 50) were 89 percent of the average for the last 52 years (1951-2002). The last spring frost was 9 days late with the first fall frost 2 days late resulting in 121 frost-free days, 7 days shorter than the 87-year average. September 2001 through March 2002 precipitation was 50 percent of the long-term average and added very little to stored soil moisture. The April through July growing season saw an average daily temperature at 56 degrees F, slightly below normal. July and August average temperatures were 1.5 percent lower than normal with the high for 2002 recorded on July 13 at 99 degrees F. There were 20 days over 90 degrees F, 76 percent of the average at 26.2. Conditions of severe drought early in the season followed by normal precipitation for May and above normal precipitation for June, July and August resulted in reduced crop yields, abnormally high protein and moderate reduction in grain test weight. Minimum winter temperature was -25 degrees F on March 9. Crop outlook was initially very bleak with limited surface soil moisture and sluggish early crop development. Most winter wheat did not germinate until late winter or early spring resulting in very poor stand establishment. However, yields were surprisingly better than expected. Yield and test weight comparisons with long-term averages varied according to crop and location (WW=reduced yields and moderately low test weights,

SW=reduced yields and normal test weights, BLY=slightly reduced yields and relatively normal test weights, and OAT=low yields and low to normal test weights). The above trends were largely associated with time of planting, but were in contrast to that normally expected. Winter wheat and spring grains planted at what would normally be considered optimum dates suffered irreversible damage from early drought stress. Some later spring plantings totally escaped this stress and benefited from the cooler and wetter conditions arriving in early May.

Off-station cropping environments were extremely variable in 2002. The Loma location again had far below-average precipitation and suffered from substantial heat stress during periods critical to the production of cereal crops. All winter wheat was lost at the Loma location. Most winter wheat did not germinate until late winter or early spring. Although germination did occur in time for vernalization to take place, severe crusting in the spring put the already struggling crop out of its' misery. Experiment "coefficient of variation" values were expectedly higher than normal for spring grains at Loma as drought conditions continued throughout the season at this location. The Turner locations had well above average precipitation which ultimately impacted harvest operations throughout the Big Flat area. Sawfly damage at Turner was severe with some cutting seen while wheat was still green. The Loring location had appreciable precipitation, but also experienced periods of droughty conditions. Sawfly was moderately severe at Loring. 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.

The McKeever (Loma) dryland winter wheat variety trial conducted in 2002 failed due to drought and was destroyed along with numerous other winter wheat studies in place at that site. Three-year yield and test weight summary data for selected winter wheat entries at the McKeever location for 1999-2001 are presented in Table 1. A second off-station winter wheat variety trial normally planted in northern Hill County for winter hardiness evaluation purposes was instead planted on-station at Havre due to hopelessly dry conditions in that region during the fall of 2001.

Stand percent, plant height, yield, test weight and protein data for the 2002 Cederberg (Turner), Flansaas/Lumsden (Loring) and McKeever (Loma) dryland spring wheat trials are summarized in Tables 2, 4 and 6, 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 3, 5 and 7, respectively.

Stand percent, plant height, yield, test weight and protein data for the 2002 Cederberg (Turner) dryland Durum trial are summarized in Table 8. The evaluation of durum varieties was added at this location in 2002. After three years of data are in place, multi-year year and test weight summaries will be reported.

Stand percent, plant height, yield, test weight, plump/thin and protein data for the 2002 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, 2002 off-station variety performance trials were conducted on mechanical or chemical fallow at three locations in three northern Montana counties.

#### Dryland Winter Wheat Trial:

1. McKeever Farm & Seed, Inc., Chouteau County (12N Loma) 30-27N-10E

## 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)	30-27N-10E

## Dryland Spring Durum Trial:

1. Leon Cederberg Farm, Blaine County	(3NE Turner)	13-36N-25E
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## 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)	30-27N-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 other sites 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' eighth 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 2007 which will mark 20 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. 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. 1999-2002.**

2/ VARIETY or SELECTION	No. of YEARS TESTED	1/ YIELD (Bushels Per Acre)						TEST WEIGHT (Pounds Per Bushel)							
						AVE. for YEARS TESTED	% of CHECK YIELD	3-YR COMP. AVE. YIELD					AVE. for YEARS TESTED	% of CHECK TEST WT	3-YR COMP. AVE. TEST WT
		1999	2000	2001	2002 3/		4/	5/	1999	2000	2001	2002 3/		4/	5/
PI593889	RAMPART (sawfly resis.)	3	35.9	42.7	16.4	31.7	116.7	<b>31.7</b>	61.8	62.2	55.0	59.6	100.9	<b>59.6</b>	
PI517194	TIBER	3	36.7	44.9	13.1	31.6	116.2	<b>31.6</b>	62.4	62.7	54.3	59.8	101.2	<b>59.8</b>	
CI 17879	ROCKY	3	33.2	47.0	13.3	31.2	114.7	<b>31.2</b>	62.8	63.6	54.6	60.3	102.1	<b>60.3</b>	
PI584526	JUDITH	3	43.7	36.1	12.4	30.7	113.2	<b>30.7</b>	61.4	60.6	51.9	58.0	98.1	<b>58.0</b>	
PI593891	VANGUARD (sawfly res.)	3	32.6	41.4	15.7	29.9	110.1	<b>29.9</b>	62.3	62.3	54.6	59.7	101.1	<b>59.7</b>	
MT 9432	BIGSKY (++)	3	39.6	38.5	11.4	29.8	109.8	<b>29.8</b>	63.2	62.6	55.0	60.3	102.0	<b>60.3</b>	
PI584505	HALT	3	33.1	46.9	8.9	29.6	109.1	<b>29.6</b>	62.6	62.8	54.9	60.1	101.7	<b>60.1</b>	
PI599336	MORGAN (P+)	3	40.6	37.2	10.9	29.6	108.9	<b>29.6</b>	61.8	61.9	53.1	59.0	99.8	<b>59.0</b>	
CI 17860	NEELEY	3	34.9	39.5	12.3	28.9	106.3	<b>28.9</b>	61.6	61.9	51.7	58.4	98.8	<b>58.4</b>	
PI555458	PROMONTORY	3	35.8	39.7	9.3	28.3	104.1	<b>28.3</b>	63.5	63.5	55.2	60.7	102.8	<b>60.7</b>	
PI593890	McGUIRE	3	34.6	37.3	11.5	27.8	102.3	<b>27.8</b>	62.4	61.9	55.6	60.0	101.5	<b>60.0</b>	
PI564761	ERHARDT	3	38.3	34.3	10.2	27.6	101.6	<b>27.6</b>	62.4	62.7	54.9	60.0	101.5	<b>60.0</b>	
RH78W296	BIGHORN (P+)	3	37.3	34.2	10.7	27.4	100.9	<b>27.4</b>	62.7	62.6	54.9	60.0	101.6	<b>60.0</b>	
CI 17735	NORSTAR	3	35.8	36.5	9.2	27.2	100.0	<b>27.2</b>	61.1	62.2	54.0	59.1	100.0	<b>59.1</b>	
MTW 9441	NUWEST/TIBER (hrd wht)	3	35.8	27.5	13.2	25.5	93.8	<b>25.5</b>	61.8	61.1	55.0	59.3	100.4	<b>59.3</b>	
PI586806	NUWEST (hard white)	3	32.8	34.0	8.8	25.2	92.7	<b>25.2</b>	60.9	61.7	55.3	59.3	100.4	<b>59.3</b>	
PI596352	ELKHORN (+)	3	25.1	36.7	9.4	23.7	87.4	<b>23.7</b>	59.9	62.3	53.2	58.5	99.0	<b>58.5</b>	
MEANS (For Entries Listed)			35.6	38.5	11.6			28.6	62.0	62.3	54.3			59.5	
6/ 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 <sub>2</sub> O <sub>5</sub> )	40.0	40.0	40.0	40.00									
		(# K <sub>2</sub> O)	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 selection decisions.

2/ P = Private Variety, + = Protected Variety

3/ Nursery abandoned due to poor stand establishment resulting from drought stress

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

5/ 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.

6/ Seeding to 14 days prior to harvest maturity.

**TABLE 2. Dryland Fallow Spring Wheat Cultivar Evaluation Nursery Grown Off-Station at the Leon Cederberg Farm, Turner. Northern Agricultural Research Center. Havre, Montana. 2002. (Exp# 02-9951-SW)**

ID	CULTIVAR or SELECTION	1/			2/		3/	
		STAND %	PLNT HT Inches	SAWFLY Rating	YIELD Bu/Ac	MOISTURE %	TEST WT Lbs/Bu	PROTEIN %
PI574642	MCNEAL	94.1	24.8	3.3	44.2	13.9	58.4	14.6
MT 9929	MT9401/MT9328 (sawfly resistant)	88.9	22.4	1.7	40.9	13.3	57.6	14.7
PI607557	SCHOLAR (moderately sawfly resistant)	98.3	26.9	2.7	39.3	13.2	58.2	14.7
MT 9806	MINNPRO/AMIDON	94.8	25.1	2.0	38.8	13.4	58.5	15.4
ND 695	REEDER	92.7	24.1	2.3	38.7	13.8	59.1	14.3
PI592761	ERNEST (sawfly resistant)	95.1	26.6	2.0	38.2	13.3	57.2	15.1
PI527682	AMIDON (moderately sawfly resistant)	95.1	27.6	2.0	37.5	13.1	57.0	14.6
BZ992588	CONAN (sawfly tolerant)	97.2	24.5	1.7	37.5	13.6	59.1	15.0
PI549275	HI-LINE	92.3	23.6	3.0	37.4	13.7	58.3	14.5
C982-324	RAMBO (moderately sawfly resistant)	95.9	23.1	1.3	36.9	14.0	58.5	13.7
WB 936	WESTBRED 936	78.1	22.1	2.3	36.5	13.4	57.3	14.5
WBEXPRES	WESTBRED EXPRESS	78.1	21.8	3.0	36.5	13.4	58.2	14.5
CI 17429	LEW (sawfly resistant)	95.1	28.2	1.0	36.3	13.9	58.9	14.3
BZ992322	HANK	83.3	23.1	2.0	35.7	13.1	57.7	14.7
MT 9874	RGABC199/MT9312 (Russian grain aphid resist)	94.1	24.9	1.7	34.2	13.5	58.7	14.0
CI 17430	NEWANA	91.3	23.8	2.7	32.6	13.3	58.4	13.5
PI619086	EXPLORER (hard white wheat)	91.7	24.5	2.7	32.6	13.0	57.4	14.3
MTHW9420	MT8182/MT8289 (hard white wheat)	89.6	21.9	3.3	32.4	13.3	56.8	14.0
WB 926	WESTBRED 926	92.0	23.5	2.0	31.8	13.5	57.5	14.5
CI 13596	FORTUNA (sawfly resistant)	93.4	29.5	1.3	30.3	13.5	58.1	14.5
EXPERIMENTAL MEANS		91.6	24.6	2.2	36.4	13.5	58.1	14.5
LSD (0.05)		9.6	2.6	1.2	5.1	0.7	1.0	.
C.V.2: (S of MEAN / MEAN)*100		3.7	3.7	18.7	4.9	1.9	0.6	.

1/ Sawfly Rating: 1=1-25% stem cutting, 2=26-50%, 3=51-75%, 4=>76%

2/ Volumetric yields are based on plot weights adjusted to uniform 12 percent grain moisture and 60 lbs/bu as the standard test weight for wheat

3/ Protein values are adjusted to 12 percent grain moisture.

Site Resource & Management Data:					
Cropping System	CT-MechFlw	pH 0-6"	6.2	Soil Texture 0-6"	CL-
Planting Date	5/21	Org.Matter (%) 0-6"	1.4	Soil Texture 6-24"	SCL
Planting Depth (in.)	1.5	N (lbs/ac) 0-6"	16	Soil Texture 24-36"	CL-
Moist Soil Depth @Plnt'g	48+	N (lbs/ac) 6-24"	12	Soil Texture 36-48"	CL-
Dry Surf Soil (in.) @Plnt'g	1	N (lbs/ac) 24-36"	4	Fertilizer Formulation	Gran. Blend
2" Soil Temp (oF) @ Plnt'g	77	N (lbs/ac) 36-48"	4	Fertilizer Placement	Bnd at Plntg
4" Soil Temp (oF) @ Plnt'g	66	P (ppm) Olsen 0-6"	17	Fert. Rate (lbs/ac) N	<sup>1</sup> 11
Precip (in.) Plnt'g-Harvest		K (ppm) 0-6"	249	Fert. Rate (lbs/ac) P2O5	52
Harvest Date	9/28	S (ppm) 0-24"	24	Fert. Rate (lbs/ac) K2O	0

<sup>1</sup>Cooperating landowner applied pre-plant N @ 50lbs/ac via anhydrous ammonia injection

**TABLE 3. 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. 1993-2002.**

2/ VARIETY or SELECTION	No. of YEARS TESTED 3/	1/ YIELD (Bushels Per Acre)					TEST WEIGHT (Pounds Per Bushel)					10-YR COMP. AVE. TEST WT 6/					
		1998	1999	2000	2001	2002	AVE. for YEARS TESTED 3/	% of CHECK YIELD 5/	10-YR COMP. AVE. YIELD 6/	1998	1999		2000	2001	2002	AVE. for YEARS TESTED 3/	% of CHECK TEST WT 5/
ND 695 REEDER (+)	3			49.9	40.1	38.7	42.9	130.1	<b>45.9</b>			61.9	62.4	59.1	61.1	101.5	<b>60.8</b>
PI574642 McNEAL	9	51.5		52.7	42.6	44.2	45.3	128.3	<b>45.3</b>	58.4		59.9	60.6	58.4	58.8	98.2	<b>58.8</b>
CI 17430 NEWANA	9	51.5		48.5	41.6	32.6	43.6	123.5	<b>43.6</b>	58.1		61.1	61.9	58.4	59.4	99.3	<b>59.4</b>
PI549275 HI-LINE	9	53.1		49.0	42.6	37.4	43.3	122.7	<b>43.3</b>	58.0		60.5	61.2	58.3	58.8	98.2	<b>58.8</b>
PI527682 AMIDON (mod.swfly res.)	9	50.9		46.1	39.5	37.5	43.2	122.4	<b>43.2</b>	58.7		61.1	61.6	57.0	59.1	98.8	<b>59.1</b>
PI607557 SCHOLAR(+)(mod.sf res)	6	50.8		47.3	38.8	39.3	41.8	122.3	<b>43.2</b>	59.5		61.8	62.0	58.2	60.1	100.1	<b>60.0</b>
WBEXPRES WB EXPRESS (P+)	7	49.2		48.6	37.7	36.5	42.6	120.4	<b>42.5</b>	58.1		60.3	60.9	58.2	59.0	98.2	<b>58.8</b>
WB 936 WB 936 (P+)	7	49.3		50.0	35.2	36.5	42.6	120.3	<b>42.5</b>	57.4		60.6	61.8	57.3	58.8	97.8	<b>58.6</b>
PI619086 EXPLORER (hard white)	3			51.4	33.9	32.6	39.3	119.3	<b>42.1</b>			60.4	60.9	57.4	59.6	98.9	<b>59.2</b>
PI531005 GRANDIN	8	49.5		48.0	42.9		42.6	118.5	<b>41.8</b>	57.8		61.5	62.5		59.2	98.5	<b>59.0</b>
BZ992588 CONAN (P+) (sawfly tol)	3			43.0	36.0	37.5	38.8	117.8	<b>41.6</b>			60.5	62.0	59.1	60.5	100.5	<b>60.2</b>
PI592761 ERNEST (+) (sawfly res.)	8	49.5		45.2	41.0	38.2	41.3	117.7	<b>41.5</b>	59.4		61.5	62.4	57.2	59.7	99.4	<b>59.5</b>
MTHW9420 MT8182/MT8289 (hd wht)	6	51.2		49.6	36.3	32.4	39.8	116.5	<b>41.1</b>	57.7		60.3	61.4	56.8	58.7	97.7	<b>58.5</b>
WPB 926 WB 926 (P)	9	45.4		46.5	35.5	31.8	40.8	115.6	<b>40.8</b>	57.6		60.2	61.1	57.5	58.5	83.8	<b>50.1</b>
C982-324 WB RAMBO (P+)(mod sf)	9	46.2		43.4	36.8	36.9	40.0	113.3	<b>40.0</b>	58.9		61.0	62.3	58.5	59.9	100.1	<b>59.9</b>
CI 17429 LEW (sawfly resistant)	9	46.8		41.0	36.9	36.3	38.3	108.4	<b>38.3</b>	60.5		60.9	62.2	58.9	60.1	100.4	<b>60.1</b>
CI 13596 FORTUNA (sawfly resis.)	9	42.1		43.0	25.6	30.3	35.3	100.0	<b>35.3</b>	60.6		60.7	61.9	58.1	59.9	100.0	<b>59.9</b>
MEANS (For Entries Listed)		49.1		47.2	37.8	36.2			41.9	58.6		60.8	61.7	58.0			58.9
7/ Growing Season Precipitation (in.)		Pndg		Pndg	Pndg	Pndg	7.27										
Soil PAW (in.) to SD @ Planting		Pndg		Pndg	Pndg	Pndg	5.65	5.95									
Total Plant Available Water (in.)		Pndg		Pndg	Pndg	Pndg	5.65	12.01									
Soil NO3 (lbs.) to SD at Planting		Pndg		Pndg	Pndg	36	47.33										
SD (Sampling Depth in Inches)		48		48.0	48.0	48.0	48.00										
Fertilizer Applied																	
	(# N)	66.0		70.0	70.0	70.0	66.89										
	(# P <sub>2</sub> O <sub>5</sub> )	33.0		40.0	40.0	40.0	35.56										
	(# K <sub>2</sub> O)	0.0		25.0	25.0	25.0	8.33										

Check Variety is Fortuna

1/ See MGES 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/ 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 4. Dryland Fallow Spring Wheat Cultivar Evaluation Nursery Grown Off-Station at the Flansaas/ Lumsden Farm, Loring. Northern Agricultural Research Center. Havre, Montana. 2002. (Exp# 02-9955-SW)**

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/	2/	MOISTURE %	TEST WT Lbs/Bu	3/
				SAWFLY Rating	YIELD Bu/Ac			PROTEIN %
PI574642	McNEAL	99.3	27.5	2.0	38.1	11.1	58.3	15.3
PI607557	SCHOLAR (moderately sawfly resistant)	99.3	30.8	1.0	37.0	11.1	59.9	15.6
ND 695	REEDER	99.3	26.3	1.2	36.3	10.8	58.8	15.9
BZ992322	HANK	93.1	27.4	1.3	36.1	10.9	56.2	16.1
MT 9874	RGABC199/MT9312 (Russian grain aphid resist)	99.0	27.8	1.2	35.6	11.0	58.0	15.3
WB 926	WESTBRED 926	100.0	24.3	1.3	35.6	10.8	57.5	16.5
PI549275	HI-LINE	97.6	24.8	1.2	35.1	10.7	57.5	15.8
WB 936	WESTBRED 936	95.8	23.5	1.5	35.0	10.9	56.7	15.9
PI619086	EXPLORER (hard white wheat)	97.9	26.9	1.3	34.8	11.1	58.2	15.9
MT 9806	MINNPRO/AMIDON	99.0	28.0	1.5	34.7	11.0	58.3	16.5
PI592761	ERNEST (sawfly resistant)	96.5	29.7	0.8	34.7	10.8	58.2	15.6
CI 17429	LEW (sawfly resistant)	98.3	30.1	0.7	34.5	11.4	60.0	14.5
CI 17430	NEWANA	98.6	23.3	2.0	34.4	10.9	59.1	14.4
BZ992588	CONAN (sawfly tolerant)	98.3	24.8	1.0	34.1	11.2	59.9	16.1
MTHW9420	MT8182/MT8289 (hard white wheat)	99.3	25.0	2.0	33.9	10.8	57.4	15.2
PI527682	AMIDON (moderately sawfly resistant)	95.5	30.0	1.2	33.7	10.9	58.2	14.6
C982-324	RAMBO (moderately sawfly resistant)	98.6	24.8	1.0	33.4	11.4	60.1	15.2
MT 9929	MT9401/MT9328 (sawfly resistant)	95.8	24.2	0.5	33.4	10.8	57.1	15.9
WBEXPRES	WESTBRED EXPRESS	93.7	23.0	1.8	32.9	10.6	58.2	15.3
CI 13596	FORTUNA (sawfly resistant)	97.6	31.2	0.7	31.5	11.3	59.1	14.9
EXPERIMENTAL MEANS		97.6	26.7	1.3	34.7	11.0	58.4	15.5
LSD (0.05)		5.0	2.3	0.6	3.8	0.2	0.9	.
C.V.2: (S of MEAN / MEAN)*100		1.8	3.0	16.1	3.8	0.8	0.5	.

1/ Sawfly Rating: 1=1-25% stem cutting, 2=26-50%, 3=51-75%, 4=>76%

2/ Volumetric yields are based on plot weights adjusted to uniform 12 percent grain moisture and 60 lbs/bu as the standard test weight for wheat

3/ Protein values are adjusted to 12 percent grain moisture.

Site Resource & Management Data:					
Cropping System	CT-MechFlw	pH 0-6"	5.8	Soil Texture 0-6"	CL-
Planting Date	5/4	Org.Matter (%) 0-6"	1.2	Soil Texture 6-24"	CL
Planting Depth (in.)	1.5	N (lbs/ac) 0-6"	14	Soil Texture 24-36"	CL
Moist Soil Depth @Plnt'g	48+	N (lbs/ac) 6-24"	18	Soil Texture 36-48"	CL
Dry Surf Soil (in.) @Plnt'g	1	N (lbs/ac) 24-36"	20	Fertilizer Formulation	Gran. Blend
2" Soil Temp (oF) @ Plnt'g	60	N (lbs/ac) 36-48"	28	Fertilizer Placement	Bnd at Plntg
4" Soil Temp (oF) @ Plnt'g	56	P (ppm) Olsen 0-6"	19	Fert. Rate (lbs/ac) N	70
Precip (in.) Plnt'g-Harvest	11.02	K (ppm) 0-6"	312	Fert. Rate (lbs/ac) P2O5	40
Harvest Date	8/30	S (ppm) 0-24"	187	Fert. Rate (lbs/ac) K2O	25

**TABLE 5. Seven-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, 1996-2002.**

2/ VARIETY or SELECTION	No. of YEARS TESTED 3/	1/ YIELD (Bushels Per Acre)							TEST WEIGHT (Pounds Per Bushel)								
		1998	1999	2000	2001	2002	AVE	%	7-YR COMP. AVE YIELD 5/	1998	1999	2000	2001	2002	AVE	%	7-YR COMP. AVE TEST WT 5/
							for YEARS TESTED 3/	of CHECK YIELD 4/							for YEARS TESTED 3/	of CHECK TEST WT 4/	
ND 695 REEDER (+)	4		49.4	41.2	42.0	36.3	42.2	127.4	<b>38.2</b>		60.1	62.1	61.7	58.8	60.7	101.1	<b>59.8</b>
PI574642 McNEAL	7	31.7	47.0	42.8	39.3	38.1	37.5	125.2	<b>37.5</b>	54.2	59.1	59.7	59.9	58.3	58.1	98.1	<b>58.1</b>
CI 17430 NEWANA	7	28.2	47.7	41.7	40.6	34.4	37.0	123.3	<b>37.0</b>	52.7	58.8	61.3	61.3	59.1	58.8	99.4	<b>58.8</b>
PI531005 GRANDIN	6	29.8	44.9	41.2	38.6		36.1	121.6	<b>36.5</b>	51.8	58.2	61.3	61.3		58.4	98.6	<b>58.4</b>
PI549275 HI-LINE	7	29.5	45.3	40.0	43.3	35.1	36.3	121.2	<b>36.3</b>	51.6	58.2	60.9	60.9	57.5	57.8	97.7	<b>57.8</b>
WB 936 WB 936 (P+)	7	30.1	42.6	40.4	40.6	35.0	36.2	120.8	<b>36.2</b>	52.8	58.0	60.6	60.4	56.7	58.0	97.9	<b>58.0</b>
PI607557 SCHOLAR (+)(mod.sf res.)	7	31.4	45.4	37.7	36.5	37.0	36.0	120.1	<b>36.0</b>	57.3	59.0	61.6	61.6	59.9	60.0	101.3	<b>60.0</b>
PI527682 AMIDON (mod.sw fly res.)	7	26.9	45.3	38.9	40.4	33.7	35.8	119.5	<b>35.8</b>	54.9	57.6	61.2	61.1	58.2	58.8	99.4	<b>58.8</b>
WBEXPRES WB EXPRESS (P+)	7	30.5	47.8	37.4	38.0	32.9	35.1	117.1	<b>35.1</b>	54.3	58.8	59.9	60.2	58.2	58.2	98.4	<b>58.2</b>
BZ992588 CONAN (P+) (saw fly tol)	4		43.0	37.7	39.0	34.1	38.4	115.9	<b>34.7</b>		60.6	61.0	61.4	59.9	60.7	101.2	<b>59.9</b>
PI592761 ERNEST (+) (saw fly res.)	7	27.3	40.4	38.1	38.2	34.7	34.4	114.7	<b>34.4</b>	54.8	57.7	61.4	61.8	58.2	58.9	99.6	<b>58.9</b>
MTHW9420 MT8182/MT8289 (hrd w ht)	7	29.7	40.1	39.2	35.7	33.9	34.2	114.0	<b>34.2</b>	53.3	58.0	60.4	60.9	57.4	58.1	98.2	<b>58.1</b>
WPB 926 WB 926 (P)	7	28.1	38.5	40.4	36.4	35.6	34.1	113.8	<b>34.1</b>	53.6	57.7	60.1	60.1	57.5	58.0	98.1	<b>58.0</b>
PI EXPLORER (hard w white)	3			38.2	36.2	34.8	36.4	113.1	<b>33.9</b>			60.7	60.5	58.2	59.8	98.6	<b>58.3</b>
C982-324 WB RAMBO (P+) (mod sf)	7	27.4	44.0	38.5	37.2	33.4	33.6	112.0	<b>33.6</b>	56.6	59.5	61.2	61.5	60.1	59.7	101.0	<b>59.7</b>
CI 17429 LEW (saw fly resistant)	7	24.7	38.4	35.1	35.6	34.5	32.3	107.8	<b>32.3</b>	56.5	59.7	61.3	61.9	60.0	59.7	100.8	<b>59.7</b>
CI 13596 FORTUNA (saw fly resis.)	7	24.5	34.4	33.9	32.8	31.5	30.0	100.0	<b>30.0</b>	55.3	58.2	61.1	61.7	59.1	59.2	100.0	<b>59.2</b>
MEANS (For Entries Listed)		28.6	43.4	39.0	38.3	34.7			35.0	54.3	58.7	60.9	61.1	58.6			58.8
6/ Growing Season Precipitation (in.)		5.20	Pndg	Pndg	Pndg	Pndg	5.25										
Soil PAW (in.) to SD @ Planting		6.30	Pndg	Pndg	Pndg	Pndg	5.70										
Total Plant Available Water (in.)		11.50	Pndg	Pndg	Pndg	Pndg	10.95										
Soil NO3 (lbs.) to SD at Planting		130.0	Pndg	Pndg	Pndg	80.0	72.50										
SD (Sampling Depth in Inches)		48.0	48.0	48.0	48.0	48.0	48.00										
Fertilizer Applied	(# N)	70.0	70.0	70.0	70.0	70.0	71.00										
	(# P <sub>2</sub> O <sub>5</sub> )	40.0	40.0	40.0	40.0	40.0	39.43										
	(# K <sub>2</sub> O)	25.0	25.0	25.0	25.0	25.0	20.86										

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/ 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/ 7-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 = 7-Yr average yield or test weight for the check variety Fortuna.

6/ Seeding to 14 days prior to harvest maturity.

**TABLE 6. Dryland Fallow Spring Wheat Cultivar Evaluation Nursery Grown Off-Station at McKeever Farm & Seed, Inc., Loma. Northern Agricultural Research Center. Havre, Montana. 2002. (Exp# 02-9957-SW)**

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/		2/	
				YIELD Bu/Ac	MOISTURE %	TEST WT Lbs/Bu	PROTEIN %
WBEXPRES	WESTBRED EXPRESS	96.9	21.9	23.8	10.5	52.7	18.5
ND 695	REEDER	100.0	25.9	22.0	10.4	52.4	19.1
WB 936	WESTBRED 936	97.5	22.9	20.2	10.6	50.0	19.9
PI607557	SCHOLAR (moderately sawfly resistant)	99.7	25.1	19.3	10.2	53.8	19.0
PI619086	EXPLORER (hard white wheat)	99.7	23.5	18.1	10.2	50.2	20.1
BZ992588	CONAN (sawfly tolerant)	98.5	22.4	18.0	11.0	52.8	19.7
MT 9806	MINNPRO/AMIDON	98.5	20.2	17.2	10.1	50.6	20.4
CI 17430	NEWANA	98.5	23.2	17.2	10.8	52.5	18.8
MT 9874	RGABC199/MT9312 (Russian grain aphid resist)	99.4	22.0	16.1	10.1	50.4	19.3
PI592761	ERNEST (sawfly resistant)	98.8	24.3	16.0	10.3	52.6	20.5
PI527682	AMIDON (moderately sawfly resistant)	99.1	25.7	15.4	10.1	52.3	19.6
WB 926	WESTBRED 926	99.1	22.5	15.4	10.3	50.0	20.4
MTHW9420	MT8182/MT8289 (hard white wheat)	99.7	25.5	14.6	10.2	49.0	19.7
BZ992322	HANK	94.1	23.3	14.5	10.1	48.3	20.5
MT 9929	MT9401/MT9328 (sawfly resistant)	99.4	22.2	14.4	10.0	49.3	20.0
PI549275	HI-LINE	99.7	21.6	14.1	10.4	49.0	20.2
CI 13596	FORTUNA (sawfly resistant)	97.8	23.5	13.8	10.8	52.1	20.0
PI574642	McNEAL	99.7	21.6	13.2	10.4	50.7	22.3
CI 17429	LEW (sawfly resistant)	98.2	27.2	13.0	10.6	52.0	21.0
C982-324	RAMBO (moderately sawfly resistant)	97.8	19.0	11.9	10.5	53.6	20.2
EXPERIMENTAL MEANS		98.6	23.2	16.4	10.4	51.2	20.0
LSD (0.05)		4.2	3.7	6.3	0.7	2.6	.
C.V.2: (S of MEAN / MEAN)*100		1.5	5.7	13.3	2.2	1.8	.

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

Site Resource & Management Data:							
Cropping System	NT-ChemFlw		pH 0-6"	6		Soil Texture 0-6"	CL
Planting Date	5/2		Org.Matter (%) 0-6"	1.4		Soil Texture 6-24"	CL
Planting Depth (in.)	1.5		N (lbs/ac) 0-6"	28		Soil Texture 24-36"	LC
Moist Soil Depth @Plnt'g	<sup>1</sup> n/a		N (lbs/ac) 6-24"	294		Soil Texture 36-48"	CL
Dry Surf Soil (in.) @Plnt'g	1.5		N (lbs/ac) 24-36"	104		Fertilizer Formulation	Grnd. Blend
2" Soil Temp (oF) @ Plnt'g	78		N (lbs/ac) 36-48"	64		Fertilizer Placement	Bnd at Plntg
4" Soil Temp (oF) @ Plnt'g	62		P (ppm) Olsen 0-6"	21		Fert. Rate (lbs/ac) N	70
Precip (in.) Plnt'g-Harvest			K (ppm) 0-6"	364		Fert. Rate (lbs/ac) P2O5	40
Harvest Date	8/29		S (ppm) 0-24"	179		Fert. Rate (lbs/ac) K2O	25

<sup>1</sup> Very hard pan of moist soil @ 6-8 inches. Could not penetrate hard pan w ith the Paul Brown probe.

**TABLE 7. Five-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. 1998-2002.**

2/ VARIETY or SELECTION	No. of YEARS TESTED	1/ YIELD (Bushels Per Acre)							TEST WEIGHT (Pounds Per Bushel)									
							AVE.	%	5-YR						AVE.	%	5-YR	
		1998	1999	2000	2001	2002	for YEARS TESTED 3/	of CHECK YIELD 4/	COMP. AVE. YIELD 5/	1998	1999	2000	2001	2002	for YEARS TESTED 3/	of CHECK TEST WT 4/	COMP. AVE. TEST WT 5/	
PI619086	EXPLORER (hard w hite)	3		30.8	9.2	18.1	19.4	122.0	<b>27.0</b>									
WBEXPRES	WB EXPRESS (P+)	3		27.3	6.5	23.8	19.2	121.0	<b>26.8</b>									
ND 695	REEDER (+)	4		34.2	30.4	7.1	22.0	23.4	118.2	<b>26.2</b>		55.5	55.9	53.6	52.4	54.4	100.6	<b>53.9</b>
WB 936	WB 936 (P+)	3		27.5	6.6	20.2	18.1	114.1	<b>25.3</b>									
WPB 926	WB 926 (P)	3	34.4	32.1	7.6	15.4	22.4	112.8	<b>25.0</b>	47.9		55.3	53.0	50.0	51.5	95.4	<b>51.1</b>	
PI607557	SCHOLAR (+)(mod.sf res.)	5	33.0	34.8	28.5	8.0	19.3	24.7	111.6	<b>24.7</b>	50.9	54.7	56.3	55.6	53.8	54.3	101.2	<b>54.3</b>
BZ992588	CONAN (P+) (saw fly tol)	4		36.7	26.0	7.1	18.0	22.0	110.7	<b>24.5</b>		55.3	56.7	56.7	52.8	55.4	102.4	<b>54.9</b>
PI574642	McNEAL	5	33.6	35.7	29.8	9.2	13.2	24.3	109.8	<b>24.3</b>	47.0	52.2	53.1	53.4	50.7	51.3	95.6	<b>51.3</b>
PI527682	AMIDON (mod.sw fly res.)	5	30.9	37.0	28.5	9.0	15.4	24.2	109.1	<b>24.2</b>	51.1	53.7	55.7	54.3	52.3	53.4	99.6	<b>53.4</b>
CI 17430	NEWANA	5	26.9	37.3	25.3	8.4	17.2	23.0	103.9	<b>23.0</b>	44.9	54.8	55.0	55.7	52.5	52.6	98.0	<b>52.6</b>
PI549275	HI-LINE	5	32.3	30.7	27.3	9.1	14.1	22.7	102.6	<b>22.7</b>	45.6	53.0	54.2	51.6	49.0	50.7	94.5	<b>50.7</b>
PI592761	ERNEST (+) (saw fly res.)	5	30.2	29.9	28.3	8.6	16.0	22.6	102.0	<b>22.6</b>	50.4	53.3	56.8	54.7	52.6	53.6	99.9	<b>53.6</b>
CI 13596	FORTUNA (saw fly resis.)	5	31.5	31.7	26.1	7.7	13.8	22.2	100.0	<b>22.2</b>	51.9	54.4	55.7	54.0	52.1	53.6	100.0	<b>53.6</b>
C982-324	WB RAMBO (P+) (mod sf)	5	25.8	34.1	27.5	8.9	11.9	21.6	97.6	<b>21.6</b>	48.2	54.8	57.0	56.1	53.6	53.9	100.6	<b>53.9</b>
MTHW9420	MT8182/MT8289 (hrd w ht)	4		26.7	25.9	6.7	14.6	18.5	93.2	<b>20.6</b>		51.4	53.8	51.9	49.0	51.5	95.3	<b>51.1</b>
CI 17429	LEW (saw fly resistant)	5	27.6	29.8	21.8	7.6	13.0	20.0	90.1	<b>20.0</b>	50.9	54.4	54.6	53.9	52.0	53.2	99.1	<b>53.2</b>

MEANS (For Entries Listed) 30.6 33.2 27.7 8.0 16.6 23.8 48.9 54.0 55.2 54.1 51.6 52.9

6/ Growing Season Precipitation (in.)		Pndg	Pndg	Pndg	Pndg	8.75	8.75
Soil PAW (in.) to SD @ Planting		Pndg	Pndg	Pndg	Pndg	Pndg	Pndg
Total Plant Available Water (in.)		Pndg	Pndg	Pndg	Pndg	Pndg	Pndg
Soil NO3 (lbs.) to SD at Planting		Pndg	Pndg	Pndg	Pndg	Pndg	Pndg
SD (Sampling Depth in Inches)		48.0	48.0	48.0	48.0	48.0	48.00
Fertilizer Applied	(# N)	70.0	70.0	65.0	65.0	70.0	68.00
	(# P <sub>2</sub> O <sub>5</sub> )	40.0	40.0	40.0	40.0	40.0	40.00
	(# K <sub>2</sub> O)	25.0	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 to evaluate varieties and breeding materials in the presence of wheat stem saw fly. Saw fly pressure was weak in 1998, 2001 and but was significant in 1999 and 2000. Hail damage at the location confounded studies in 1999. Heat and drought stress was prevalent at critical growth stages during all five years. The plot combine was equipped with pick-up guards similar to those commonly used on full-scale combines for straight-cut harvest under saw fly 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/ 5-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 = 5-Yr average yield or test weight for the check variety Fortuna.

6/ Seeding to 14 days prior to harvest maturity.

**TABLE 8. Dryland Fallow Spring Durum Cultivar Evaluation Nursery Grown Off-Station at the Leon Cederberg Farm, Turner. Northern Agricultural Research Center. Havre, Montana. 2002. (Exp# 02-9851-SW)**

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/	2/	MOISTURE %	TEST WT Lbs/Bu	3/
				SAWFLY Rating	YIELD Bu/Ac			PROTEIN %
D91080	PLAZA	96.5	23.1	1.3	49.5	13.2	61.9	11.5
ACAVONLE	AC AVONLEA	90.3	27.1	1.3	39.8	13.0	61.2	14.0
WPBLAKER	LAKER	93.8	23.9	1.3	37.3	12.9	61.5	12.6
DT 380	SCEPTRE	88.9	25.1	3.0	36.8	12.8	59.9	13.4
D901442	LEBSOCK	87.8	25.5	2.0	34.6	13.0	61.6	12.9
D901313	MOUNTRAIL	78.8	25.2	2.0	34.5	13.0	61.4	12.6
CANKYLE	KYLE	91.7	27.5	3.0	34.2	13.2	60.9	13.3
D89135	MAIER	88.9	23.5	3.0	33.3	12.9	60.9	13.2
DT 433	MEDORA	87.1	27.8	2.0	33.1	12.8	60.5	14.1
PI574642	MCNEAL (hard red spring wheat check)	87.8	24.3	2.7	32.3	13.0	59.5	14.2
NDMUNICH	MUNICH	90.6	24.2	3.7	32.1	12.6	59.0	13.1
CI 15892	WARD	86.8	27.2	2.3	31.4	12.8	60.3	14.0
PI510696	RENVILLE	79.2	26.6	2.7	31.1	13.0	60.6	12.9
D87130	BEN	85.4	26.3	2.0	31.1	13.2	60.6	13.4
CI 17789	VIC	86.4	26.7	3.3	29.0	12.8	60.3	13.6
PI478289	MONROE	91.0	25.7	3.7	27.7	12.6	59.5	13.6
EXPERIMENTAL MEANS		88.2	25.6	2.5	34.2	12.9	60.6	13.3
LSD (0.05)		11.6	2.1	1.6	4.8	0.5	0.8	.
C.V.2: (S of MEAN / MEAN)*100		4.5	2.8	22.3	4.9	1.4	0.5	.

1/ Sawfly Rating: 1=1-25% stem cutting, 2=26-50%, 3=51-75%, 4=>76%

2/ Volumetric yields are based on plot weights adjusted to uniform 12 percent grain moisture and 60 lbs/bu as the standard test weight for durum.

3/ Protein values are adjusted to 12 percent grain moisture.

Site Resource & Management Data:					
Cropping System	CT-MechFlw	pH 0-6"	6.2	Soil Texture 0-6"	CL-
Planting Date	5/21	Org.Matter (%) 0-6"	1.4	Soil Texture 6-24"	SCL
Planting Depth (in.)	1.5	N (lbs/ac) 0-6"	16	Soil Texture 24-36"	CL-
Moist Soil Depth @Plnt'g	48+	N (lbs/ac) 6-24"	12	Soil Texture 36-48"	CL-
Dry Surf Soil (in.) @Plnt'g	1	N (lbs/ac) 24-36"	4	Fertilizer Formulation	Gran. Blend
2" Soil Temp (oF) @ Plnt'g	77	N (lbs/ac) 36-48"	4	Fertilizer Placement	Bnd at Plntg
4" Soil Temp (oF) @ Plnt'g	66	P (ppm) Olsen 0-6"	17	Fert. Rate (lbs/ac) N	<sup>1</sup> 11
Precip (in.) Plnt'g-Harvest		K (ppm) 0-6"	249	Fert. Rate (lbs/ac) P2O5	52
Harvest Date	9/28	S (ppm) 0-24"	24	Fert. Rate (lbs/ac) K2O	0

<sup>1</sup>Cooperating landowner applied pre-plant N @ 50lbs/ac via anhydrous ammonia injection

**TABLE 9. Dryland Fallow Spring Barley Cultivar Evaluation Nursery Grown Off-Station at the Leon Cederberg Farm, Turner. Northern Agricultural Research Center. Havre, Montana. 2002. (Exp# 02-3651-SB)**

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/			PLUMP %	THIN %	2/	
				YIELD Bu/Ac	MOISTURE %	TEST WT Lbs/Bu			PROTEIN %	
BZ594-19	XENA	92.4	25.5	60.9	12.0	50.1	97.7	0.8	11.8	
MT960099	MT960099	92.7	18.5	56.3	12.1	49.8	90.2	3.9	13.9	
PI568246	BARONESSE	98.3	20.8	55.7	12.1	49.3	93.9	2.2	13.0	
MT960101	MT960101	95.5	21.1	55.5	12.0	50.4	92.3	2.9	12.2	
MT960100	MT960100	79.2	19.6	54.6	11.7	50.3	92.8	2.5	14.0	
H3860224	Lewis/Apex	70.5	20.9	53.1	12.0	50.1	96.8	1.1	14.7	
PI610264	VALIER	96.2	21.8	52.9	11.8	50.1	94.6	1.6	14.1	
MT960226	MT960226	95.5	25.2	52.0	11.7	50.6	97.0	1.0	13.9	
MT970229	MT970229	94.8	24.0	51.0	11.9	51.1	98.2	0.6	13.4	
SK 76333	HARRINGTON	87.5	22.1	49.1	11.9	49.2	94.6	2.0	13.9	
CI 15856	LEWS	88.2	21.7	44.9	11.6	50.1	91.3	2.8	14.5	
MT960228	MT960228	84.0	21.6	44.0	12.0	50.5	97.0	0.9	11.8	
MT950186	HAXBY	84.7	25.5	43.7	11.7	50.7	95.8	1.7	14.5	
PI491534	GALLATIN	77.1	22.5	43.3	11.8	49.4	93.4	2.6	14.1	
MT970116	MT970116	73.2	23.5	42.9	11.5	51.0	98.3	0.6	13.0	
ND13299	CONLON	93.7	20.8	41.2	11.8	48.9	91.0	2.6	13.7	
EXPERIMENTAL MEANS		87.7	22.2	50.1	11.9	50.1	94.7	1.9	13.5	
LSD (0.05)		18.2	2.8	11.5	0.5	1.1	.	.	.	
C.V.2: (S of MEAN / MEAN)*100		7.2	4.4	7.9	1.4	0.8	.	.	.	

1/ Volumetric yields are based on plot weights adjusted to uniform 12 percent grain moisture and 48 lbs/bu as the standard test weight for barley.  
2/ Protein values are reported on a 100% dry matter basis.

Site Resource & Management Data:					
Cropping System	CT-MechFlw	pH 0-6"	6.2	Soil Texture 0-6"	CL-
Planting Date	5/21	Org.Matter (%) 0-6"	1.4	Soil Texture 6-24"	SCL
Planting Depth (in.)	1.5	N (lbs/ac) 0-6"	16	Soil Texture 24-36"	CL
Moist Soil Depth @Plnt'g	48+	N (lbs/ac) 6-24"	12	Soil Texture 36-48"	CL
Dry Surf Soil (in.) @Plnt'g	1.0	N (lbs/ac) 24-36"	4	Fertilizer Formulation	Gran.Blend
2" Soil Temp (°F) @ Plnt'g	77	N (lbs/ac) 36-48"	4	Fertilizer Placement	Bnd at Plntg
4" Soil Temp (°F) @ Plnt'g	66	P (ppm) Olsen 0-6"	17	Fert. Rate (lbs/ac) N	<sup>1</sup> 11
Precip (in.) Plnt'g-Harvest		K (ppm) 0-6"	249	Fert. Rate (lbs/ac) P <sub>2</sub> O <sub>5</sub>	52
Harvest Date	9/28	S (ppm) 0-24"	24	Fert. Rate (lbs/ac) K <sub>2</sub> O	0

<sup>1</sup>Cooperating landowner applied pre-plant N @ 50lbs/ac via anhydrous ammonia injection

**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. 1993-2002.**

2/ VARIETY or SELECTION	No. of YEARS TESTED 3/	1/ YIELD (Bushels Per Acre)					TEST WEIGHT (Pounds Per Bushel)					10-YR COMP. AVE. YIELD 6/	10-YR COMP. TEST WT 6/				
		1998	1999 4/	2000	2001	2002	AVE. YEARS TESTED 3/	% of CHECK YIELD 5/	1998	1999 4/	2000			2001	2002	AVE. YEARS TESTED 3/	% of CHECK TEST WT 5/
BZ594-19 WPB XENA (P+)	3			77.7	49.3	60.9	62.6	120.4	<b>66.5</b>			53.5	52.7	50.1	52.1	100.7	<b>50.3</b>
NS 78054 BARONESSE (P+)	9	74.1		81.2	57.9	55.7	65.5	118.7	<b>65.5</b>	49.3		52.9	52.1	49.3	49.3	98.7	<b>49.3</b>
MT960099 MT960099	3			80.3	42.2	56.3	59.6	114.6	<b>63.2</b>			53.5	50.4	49.8	51.2	99.1	<b>49.5</b>
MT960100 MT960100	3			74.7	46.1	54.6	58.5	112.4	<b>62.0</b>			53.3	51.4	50.3	51.7	99.9	<b>49.9</b>
PI610264 VALIER (+)	3			72.3	40.8	52.9	55.3	106.4	<b>58.7</b>			53.3	51.7	50.1	51.7	100.0	<b>49.9</b>
MT960228 MT960228	3			76.2	44.0	44.0	54.7	105.2	<b>58.1</b>			54.3	53.3	50.5	52.7	101.9	<b>50.9</b>
PI483237 BOWMAN	7	69.8		61.6			61.4	105.0	<b>57.9</b>	52.0		53.7			50.8	102.0	<b>50.9</b>
ND 9866 STARK	8	75.0		51.6	40.9		58.3	102.9	<b>56.8</b>	52.4		54.1	52.9		51.2	102.5	<b>51.2</b>
SK 76333 HARRINGTON	9	72.5		68.4	33.9	49.1	56.0	101.4	<b>56.0</b>	48.7		52.9	48.0	49.2	48.2	96.4	<b>48.2</b>
PI591823 CHINOOK (+)	7	68.7		72.1			58.7	100.4	<b>55.4</b>	51.3		53.4			49.1	98.8	<b>49.3</b>
PI491534 GALLATIN	9	70.7		68.7	43.9	43.3	55.2	100.0	<b>55.2</b>	51.0		53.9	51.8	49.4	50.0	100.0	<b>50.0</b>
CI 15514 HECTOR	7	64.6		68.9			57.5	98.2	<b>54.2</b>	51.5		54.3			49.5	99.5	<b>49.7</b>
CI 15856 LEWIS	9	66.6		73.5	38.0	44.9	53.4	96.7	<b>53.4</b>	52.3		54.9	50.6	50.1	50.3	100.7	<b>50.3</b>
MT950186 HAXBY	3			62.8	33.5	43.7	46.7	89.8	<b>49.5</b>			54.5	54.1	50.7	53.1	102.6	<b>51.3</b>
MEANS (For Entries Listed)		70.3		70.7	42.8	50.5			58.0	51.1		53.7	51.7	50.0			50.0
7/ Growing Season Precipitation (in.)		9.88	Pndg	Pndg	Pndg	Pndg	7.21										
Soil PAW (in.) to SD @ Planting		3.96	Pndg	Pndg	Pndg	5.65	5.76										
Total Plant Available Water (in.)		13.84	Pndg	Pndg	Pndg	5.65	11.94										
Soil NO3 (lbs.) to SD at Planting		60	Pndg	Pndg	Pndg	36	56.57										
SD (Sampling Depth in Inches)		48	48	48	48	48	48.00										
Fertilizer Applied	(# N)	66	66	70	70	70	67.20										
	(# P <sub>2</sub> O <sub>5</sub> )	33	33	40	40	40	36.00										
	(# K <sub>2</sub> O)	21	25	25	25	25	12.10										

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 selection 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 Spring Barley Cultivar Evaluation Nursery Grown Off-Station at the Flansaas-Lumsden Farm, Loring. Northern Agricultural Research Center. Havre, Montana. 2002. (Exp# 02-3655-SB)**

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/			PLUMP %	THIN %	2/	
				YIELD Bu/Ac	MOISTURE %	TEST WT Lbs/Bu			PROTEIN %	
MT970229	MT970229	98.6	22.8	60.2	10.9	47.5	82.1	6.3	15.0	
MT960226	MT960226	98.6	21.7	58.4	10.6	46.3	73.2	10.5	14.8	
MT960100	MT960100	92.0	21.0	57.9	10.7	46.8	51.7	22.0	15.2	
PI568246	BARONESSE	99.7	21.8	57.3	10.5	43.4	50.0	21.2	15.7	
BZ594-19	XENA	94.1	24.4	56.4	10.7	44.9	59.2	16.3	14.8	
MT950186	HAXBY	97.2	22.8	56.1	10.8	47.6	72.6	8.1	15.3	
PI610264	VALIER	96.5	23.8	56.0	10.8	46.2	47.9	23.1	15.6	
MT960099	MT960099	89.9	19.8	55.1	10.7	45.4	45.6	27.7	15.5	
ND13299	CONLON	95.5	21.2	52.7	10.5	44.0	52.0	20.1	15.2	
MT960228	MT960228	92.4	22.1	52.2	10.6	45.3	61.5	15.5	15.3	
CI 15856	LEWS	95.1	23.0	51.8	10.7	45.7	57.6	19.2	16.4	
MT970116	MT970116	86.8	26.4	51.6	10.8	47.7	74.7	9.0	15.3	
PI491534	GALLATIN	97.6	25.8	51.5	10.7	45.8	60.9	17.7	15.8	
H3860224	Lewis/Apex	88.5	23.0	51.3	10.6	45.0	73.5	11.0	16.1	
MT960101	MT960101	97.6	21.7	50.5	11.0	45.8	58.4	18.6	15.6	
SK 76333	HARRINGTON	93.4	23.2	49.6	10.4	44.5	68.5	13.0	15.8	
EXPERIMENTAL MEANS		94.6	22.8	54.3	10.7	45.8	61.8	16.2	15.5	
LSD (0.05)		10.4	3.3	6.2	0.2	2.0	.	.	.	
C.V.2: (S of MEAN / MEAN)*100		3.8	5.0	3.9	0.7	1.5	.	.	.	

1/ Volumetric yields are based on plot weights adjusted to uniform 12 percent grain moisture and 48 lbs/bu as the standard test weight for barley.

Site Resource & Management Data:					
Cropping System	CT-MechFlw	pH 0-6"	5.8	Soil Texture 0-6"	CL-
Planting Date	5/4	Org.Matter (%) 0-6"	1.2	Soil Texture 6-24"	CL
Planting Depth (in.)	1.5	N (lbs/ac) 0-6"	14	Soil Texture 24-36"	CL
Moist Soil Depth @Plnt'g	48+	N (lbs/ac) 6-24"	18	Soil Texture 36-48"	CL
Dry Surf Soil (in.) @Plnt'g	1	N (lbs/ac) 24-36"	20	Fertilizer Formulation	Gran. Blend
2" Soil Temp (oF) @ Plnt'g	60	N (lbs/ac) 36-48"	28	Fertilizer Placement	Bnd at Plntg
4" Soil Temp (oF) @ Plnt'g	56	P (ppm) Olsen 0-6"	19	Fert. Rate (lbs/ac) N	70
Precip (in.) Plnt'g-Harvest	11.02	K (ppm) 0-6"	312	Fert. Rate (lbs/ac) P2O5	40
Harvest Date	8/30	S (ppm) 0-24"	187	Fert. Rate (lbs/ac) K2O	25

**TABLE 12. Seven-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. 1996-2002.**

2/ VARIETY or SELECTION	No. of YEARS TESTED 3/	1/ YIELD (Bushels Per Acre)							TEST WEIGHT (Pounds Per Bushel)								
		1998	1999	2000	2001	2002	AVE. YEARS TESTED 3/	% of CHECK YIELD 4/	7-YR COMP. AVE. YIELD 5/	1998	1999	2000	2001	2002	AVE. YEARS TESTED 3/	% of CHECK TEST WT 4/	7-YR COMP. AVE. TEST WT 5/
MT960100 MT960100	3			57.0	57.3	57.9	57.4	111.9	<b>57.4</b>			51.3	52.1	46.8	50.1	101.7	<b>50.1</b>
MT960099 MT960099	3			57.4	53.5	55.1	55.3	107.8	<b>55.3</b>			52.5	51.0	45.4	49.6	99.3	<b>48.9</b>
BZ594-19 WPB XENA (P+)	4		77.3	51.4	59.1	56.4	61.0	107.8	<b>55.3</b>		49.2	51.1	52.1	44.9	49.3	97.9	<b>48.2</b>
NS 78054 BARONESSE (P+)	7	46.9	79.5	56.7	57.8	57.3	54.8	106.9	<b>54.8</b>	44.6	49.4	50.8	51.3	43.4	47.8	97.0	<b>47.8</b>
MT950186 HAXBY	4		74.9	54.8	54.7	56.1	60.1	106.2	<b>54.4</b>		52.5	53.7	53.4	47.6	51.8	102.8	<b>50.6</b>
PI610264 VALIER (+)	4		73.2	54.8	51.4	56.0	58.9	103.9	<b>53.3</b>		50.6	52.3	52.4	46.2	50.4	99.9	<b>49.2</b>
MT960228 MT960228	4		74.6	56.1	51.2	52.2	58.5	103.3	<b>53.0</b>		51.0	51.6	51.6	45.3	49.9	99.7	<b>49.1</b>
PI491534 GALLATIN	7	45.1	69.4	51.2	54.4	51.5	51.3	100.0	<b>51.3</b>	45.7	51.7	51.9	52.2	45.8	49.2	100.0	<b>49.2</b>
CI 15856 LEWIS	7	34.9	70.0	58.2	51.5	51.8	50.5	98.6	<b>50.5</b>	47.3	51.7	52.4	52.3	45.7	49.6	100.8	<b>49.6</b>
PI591823 CHINOOK (+)	5	41.1	64.8	53.0			49.0	96.7	<b>49.6</b>	46.7	52.0	51.7		49.2	99.7	<b>49.1</b>	
CI 15514 HECTOR	5	38.4	69.6	52.9			48.6	96.1	<b>49.3</b>	45.9	51.3	52.2		49.3	100.0	<b>49.2</b>	
SK 76333 HARRINGTON	7	37.7	69.0	52.8	53.0	49.6	49.0	95.6	<b>49.0</b>	45.6	49.6	50.9	50.6	44.5	48.1	97.7	<b>48.1</b>
PI483237 BOWMAN	5	39.1	67.7	46.7			46.0	90.9	<b>46.6</b>	47.2	52.0	52.6		50.4	102.1	<b>50.3</b>	
ND 9866 STARK	6	43.2	60.8	44.2	45.5		44.8	87.5	<b>44.9</b>	46.4	50.9	53.2	53.4	50.6	101.6	<b>50.0</b>	
MEANS (For Entries Listed)		40.8	70.9	53.4	53.6	54.4			51.8	46.2	51.0	52.0	52.0	45.6			49.2
6/ Growing Season Precipitation (in.)		5.20	Pndg	Pndg	Pndg	Pndg		5.06									
Soil PAW (in.) to SD @ Planting		6.30	Pndg	Pndg	Pndg	Pndg		5.70									
Total Plant Available Water (in.)		11.50	Pndg	Pndg	Pndg	Pndg		10.76									
Soil NO3 (lbs.) to SD at Planting		130.0	Pndg	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)	70.0	70.0	70.0	70.0	70.0		71.00									
	(# P <sub>2</sub> O <sub>5</sub> )	40.0	40.0	40.0	40.0	40.0		39.43									
	(# K <sub>2</sub> O)	25.0	25.0	25.0	25.0	25.0		20.86									

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 selection 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/ 7-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 = 7-Yr average yield or test weight for the check variety Gallatin.

6/ Seeding to 14 days prior to harvest maturity.

**TABLE 13. Dryland Fallow Spring Barley Cultivar Evaluation Nursery Grown Off-Station at McKeever Farm & Seed, Inc., Loma. Northern Agricultural Research Center. Havre, Montana. 2002. (Exp# 02-3657-SB)**

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/	MOISTURE %	TEST WT Lbs/Bu	PLUMP %	THIN %	2/
				YIELD Bu/Ac					PROTEIN %
MT960228	MT960228	99.1	27.6	50.8	9.7	42.4	13.5	61.0	19.3
MT970116	MT970116	96.0	27.3	50.8	10.1	45.3	30.2	37.1	19.6
PI610264	VALIER	95.0	23.4	40.1	10.3	44.7	5.0	68.5	21.3
MT970229	MT970229	95.1	24.8	40.1	9.9	43.4	44.8	27.5	19.7
CI 15856	LEWIS	93.8	23.9	38.6	10.1	42.7	5.6	75.3	21.3
MT960226	MT960226	96.6	26.9	38.1	9.9	42.0	28.7	40.4	19.0
MT950186	HAXBY	91.0	26.3	35.6	9.9	43.5	19.8	50.0	20.5
BZ594-19	XENA	96.9	24.4	32.0	9.8	41.5	16.4	45.8	19.8
PI491534	GALLATIN	95.7	25.4	29.1	9.8	40.3	8.8	66.2	21.0
PI568246	BARONESSE	98.1	17.4	28.5	9.9	41.4	14.0	51.5	19.7
ND13299	CONLON	95.7	23.7	27.4	9.6	38.9	7.0	67.7	20.2
H3860224	Lewis/Apex	94.1	24.3	26.6	10.2	41.2	23.8	48.7	23.1
MT960099	MT960099	94.9	20.5	26.3	9.7	39.6	1.2	87.0	22.1
MT960100	MT960100	95.4	20.7	25.5	9.5	41.5	7.2	66.4	22.1
SK 76333	HARRINGTON	87.4	24.6	24.1	9.9	40.8	19.2	51.9	20.4
MT960101	MT960101	94.4	23.4	18.7	9.6	41.2	10.3	64.0	22.2
EXPERIMENTAL MEANS		95.0	24.0	33.3	9.9	41.9	16.0	56.8	20.7
LSD (0.05)		8.0	3.6	17.3	0.4	2.9	.	.	.
C.V.2: (S of MEAN / MEAN)*100		2.9	5.1	18.1	1.3	2.4	.	.	.

1/ Volumetric yields are based on plot weights adjusted to uniform 12 percent grain moisture and 48 lbs/bu as the standard test weight for barley.  
2/ Protein values are reported on a 100% dry matter basis.

Site Resource & Management Data:					
Cropping System	NT-ChemFlw	pH 0-6"	6	Soil Texture 0-6"	CL
Planting Date	5/2	Org.Matter (%) 0-6"	1.4	Soil Texture 6-24"	CL
Planting Depth (in.)	1.5	N (lbs/ac) 0-6"	28	Soil Texture 24-36"	LC
Moist Soil Depth @Plnt'g	<sup>1</sup> n/a	N (lbs/ac) 6-24"	294	Soil Texture 36-48"	CL
Dry Surf Soil (in.) @Plnt'g	1.5	N (lbs/ac) 24-36"	104	Fertilizer Formulation	Grnd. Blend
2" Soil Temp (oF) @ Plnt'g	78	N (lbs/ac) 36-48"	64	Fertilizer Placement	Bnd at Plntg
4" Soil Temp (oF) @ Plnt'g	62	P (ppm) Olsen 0-6"	21	Fert. Rate (lbs/ac) N	70
Precip (in.) Plnt'g-Harvest		K (ppm) 0-6"	364	Fert. Rate (lbs/ac) P2O5	40
Harvest Date	8/29	S (ppm) 0-24"	179	Fert. Rate (lbs/ac) K2O	25

<sup>1</sup> Very hard pan of moist soil @ 6-8 inches. Could not penetrate hard pan with the Paul Brown probe.

**TABLE 14. Four-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. 1999-2002.**

2/ VARIETY or SELECTION	No. of YEARS TESTED	1/ YIELD (Bushels Per Acre)							TEST WEIGHT (Pounds Per Bushel)						
		1999	2000	2001	2002	AVE. for YEARS TESTED	% of CHECK YIELD 3/	4-YR COMP. AVE. YIELD 4/	1999	2000	2001	2002	AVE. for YEARS TESTED	% of CHECK TEST WT 3/	4-YR COMP. AVE. TEST WT 4/
MT960099 MT960099	3		45.8	9.6	56.3	37.2	109.5	<b>41.3</b>		45.8	44.3	49.8	46.6	100.8	<b>47.7</b>
BZ594-19 WPB XENA (P+)	4	42.7	42.4	10.9	60.9	39.2	104.0	<b>39.2</b>	49.6	45.9	46.1	50.1	47.9	101.2	<b>47.9</b>
NS 78054 BARONESSE (P+)	4	42.7	46.7	11.3	55.1	39.0	103.3	<b>39.0</b>	50.6	44.9	45.4	49.3	47.6	100.4	<b>47.6</b>
MT950186 HAXBY	4	54.8	44.1	13.1	43.7	38.9	103.2	<b>38.9</b>	52.6	47.7	47.2	50.7	49.5	104.6	<b>49.5</b>
MT960228 MT960228	4	56.3	43.2	11.3	44.0	38.7	102.6	<b>38.7</b>	49.4	47.2	46.3	50.5	48.3	102.1	<b>48.3</b>
P491534 GALLATIN	4	48.9	46.0	12.7	43.3	37.7	100.0	<b>37.7</b>	50.6	45.4	44.1	49.4	47.4	100.0	<b>47.4</b>
SK 76333 HARRINGTON	4	48.4	42.1	10.3	49.1	37.5	99.3	<b>37.5</b>	48.6	44.6	44.7	49.2	46.8	98.8	<b>46.8</b>
MT960100 MT960100	3		38.7	7.3	54.6	33.5	98.5	<b>37.2</b>		45.3	46.5	50.3	47.3	102.3	<b>48.4</b>
ND 9866 STARK	3	41.0	50.1	14.6		35.2	98.1	<b>37.0</b>	50.8	49.4	45.8		48.6	103.8	<b>49.1</b>
PI610264 VALIER (+)	4	46.2	33.8	8.3	52.9	35.3	93.6	<b>35.3</b>	49.9	46.1	47.7	50.1	48.4	102.3	<b>48.4</b>
CI 15856 LEWIS	4	43.3	39.0	12.7	44.9	35.0	92.7	<b>35.0</b>	51.3	46.3	45.5	50.1	48.3	102.0	<b>48.3</b>
MEANS (For Entries Listed)		47.1	42.9	11.1	50.5			37.9	50.4	46.2	45.8	50.0			48.1
5/ Growing Season Precipitation (in.)		Pndg	Pndg	Pndg	8.75										
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	490.0										
SD (Sampling Depth in Inches)		48.0	48.0		48.0			48.0							
Fertilizer Applied	(# N)	70.0	65.0	70.0	61.0			66.5							
	(# P <sub>2</sub> O <sub>5</sub> )	40.0	40.0	40.0	52.0			43.0							
	(# K <sub>2</sub> O)	25.0	25.0	25.0	25.0			25.0							

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 selection 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/ 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 Gallatin for the same years, and z = 4-Yr average yield or test weight for the check variety Gallatin.

5/ Seeding to 14 days prior to harvest maturity.