

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
Cooperating Landowners

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 2000 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 2000 crop and data season.

RESULTS:

Data details for individual trials conducted from 1983-1999 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 2000 ranged from poor to excellent across North Central Montana. At Havre, total annual growing season precipitation (9/1/99 through 8/31/00) was 10.27 inches, 15 percent less than the average for all years since 1916. April 1 through July 31 precipitation was 6.01 inches or 89 percent of the 85-year average. Heat units expressed as "Growing Degree Days" (GDD, base 50) were 101 percent of the average for the last 50 years (1951-2000). The last spring frost was 2 days early with the first fall frost 2 days late resulting in 132 frost-free days, 4 days longer than the 85-year average. September 1999 through March 2000 precipitation was 98 percent of the long-term average providing generally adequate stored soil moisture. The April through July growing season saw an average daily temperature at 58 degrees F, nearly normal. July average temperatures were 3 percent higher than normal with the high for 2000 recorded on July 14 at 103 degrees F. These conditions resulted in reduced spring wheat test weights while winter wheat test weights and yields were substantially higher than normal. August was 3 percent warmer than the long-term average. Minimum winter temperature was -12 degrees F on January 20. Crop outlook was initially fair with limited surface soil moisture and seemingly sluggish early crop development. Yield and test weight comparisons with long-term averages varied according to crop and location (WW=high yields and high test weights, SW=normal yields and low test weights, BLY=normal to high yields and normal to high test weights, and OAT=below normal yields and normal to above normal test weights). The above trends were largely associated with timeliness of planting which was of greater importance than usual in 2000. Later plantings and greater stress associated with recrop plantings resulted in lower yields and decreased test weights in 2000.

Off-station cropping environments were extremely variable in 2000. The Loma location had below-average precipitation and suffered from substantial heat stress during periods critical to the production of cereal crops (especially spring crops). Winds exceeding 80 mph just prior to winter wheat harvest accentuated the effects of the wheat stem sawfly. Experiment “coefficient of variation” values were expectedly higher than normal. The Turner and Loring locations had well above-average precipitation, but the North Havre area in general saw wide variability in precipitation from very poor to excellent. 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 2000 are summarized in Table 1. The Morse (North Havre) location was lost to winter injury. Both the McKeever and Morse locations 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. Thus, multi-year winter wheat data for the McKeever and Morse locations will not be reported until after three crop years are completed.

Stand percent, plant height, yield, test weight and protein data for the 2000 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, plump/thin and protein data for the 2000 Cederberg (Turner), Flansaas/Lumsden (Loring) and McKeever (Loma) dryland spring barley trials are summarized in Tables 8, 10 and 12, 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 and Flansaas/Lumsden locations are presented in Tables 9 and 11, respectively. Multi-year data for the McKeever location will not be reported until after three crop years have been completed in 2001.

Stand percent, sawfly damage rating, plant height, yield, test weight and protein data for the 2000 McKeever (Loma) dryland spring durum trial are summarized in Table 13. Multi-year yield and test weight summaries for selected durum entries at the McKeever location are presented in Table 14.

SUMMARY:

Eight, 2000 off-station variety performance trials were conducted on mechanical or chemical fallow at three locations in three northern Montana counties.

Dryland Winter Wheat Trials:

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|--|--------------|------------|
| 1. McKeever Farm & Seed, Inc., Chouteau County | (12N Loma) | 28-27N-10E |
| 2. Brian Morse Farm, Hill County | (30NW Havre) | 36-36N-12E |

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) | 28-27N-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)	28-27N-10E

Dryland Spring Durum Trials:

1. McKeever Farm & Seed, Inc., Chouteau County	(12N Loma)	28-27N-10E
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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, 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 suggests that the number of replicated, off-station variety trial locations needs 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' sixth 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. 2000. (Exp# 00-3853-WW)

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/ YIELD Bu/Ac	TEST WT Lbs/Bu	2/ PROTEIN %
CI 17879	ROCKY	100	24.3	47.0	63.6	12.6
PI584505	HALT	100	22.5	46.9	62.8	12.8
PI593047	PRONGHORN	100	24.6	45.1	62.4	12.5
PI517194	TIBER	100	27.0	44.9	62.7	12.4
PI593889	RAMPART (sawfly-resistant)	100	24.9	42.7	62.2	13.0
QT 542	QUANTUM 542	100	24.5	42.5	62.5	12.4
PI593891	VANGUARD (sawfly-resistant)	100	23.2	41.4	62.3	13.7
PI555458	PROMONTORY	100	27.4	39.7	63.5	12.6
CI 17860	NEELEY	100	23.8	39.5	61.9	14.2
MTS9720	NUWEST/MT88001//MT7863	100	23.9	39.2	61.6	13.7
MT 9432	BIGSKY	100	24.5	38.5	62.6	13.9
MTS9882	S86-736/VANGUARD	100	22.0	37.7	62.3	13.6
NW94L205	NUPLAINS (hard white)	100	22.7	37.6	63.8	13.4
MT9513	NUWEST/MT8030	100	24.1	37.3	61.2	13.0
PI593890	McGUIRE	100	23.7	37.3	61.9	15.1
PI599336	MORGAN	100	25.0	37.2	61.9	13.6
PI596352	ELKHORN	100	27.3	36.7	62.3	12.7
CI 17735	NORSTAR	100	28.0	36.5	62.2	13.4
PI584526	JUDITH	100	26.7	36.1	60.6	14.1
PI564761	ERHARDT	100	23.9	34.3	62.7	14.2
RH78W296	BIGHORN	100	20.8	34.2	62.6	14.1
PI586806	NUWEST (hard white)	100	23.7	34.0	61.7	14.1
MT 9426	MT8030/NLY	100	22.1	33.5	61.2	13.6
MTW9441	NUWEST/TIBER	100	24.0	27.5	61.1	14.8
EXPERIMENTAL MEANS		100	24.4	38.6	62.2	13.5
LSD (0.05)		.	2.7	7.4	0.8	.
C.V. 2: (S OF MEAN/MEAN)*100		.	3.9	6.8	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 2. Dryland Fallow Spring Wheat Cultivar Evaluation Nursery Grown Off-Station at the Leon Cederberg Farm, Turner. Northern Agricultural Research Center. Havre, Montana. 2000. (Exp# 00-9951-SW)

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/ YIELD Bu/Ac	TEST WT Lbs/Bu	2/ PROTEIN %
MT 9955	MCNEAL/KS27//MCNEAL	96.2	29.0	53.4	60.5	14.2
PI574642	McNEAL	98.3	31.2	52.7	59.9	14.3
ID377S	ID377S (hard white)	96.2	29.5	51.5	60.5	13.6
MTHW9710	MT8182/FORT//POND/M(h-wh)	98.3	28.3	51.4	60.4	15.2
WB 936	WESTBRED 936	95.8	25.5	50.0	60.6	15.4
ND 695	REEDER	99.0	30.8	49.9	61.9	15.0
MTHW9420	MT8182/MT8289 (hard white)	97.9	27.7	49.6	60.3	14.4
TR983239	FERGUS	95.5	28.7	49.5	60.5	14.7
PI549275	HI-LINE	96.9	28.0	49.0	60.5	14.0
WBEXPRS	WESTBRED EXPRESS	96.5	26.8	48.6	60.3	14.4
CI 17430	NEWANA	97.2	28.0	48.5	61.1	13.9
PI531005	GRANDIN	98.6	32.0	48.0	61.5	14.5
PI607557	SCHOLAR (mod.sawfly resist.)	99.3	31.2	47.3	61.8	14.7
WB 926	WESTBRED 926	95.5	28.2	46.5	60.2	14.5
PI527682	AMIDON (mod.sawfly resist.)	99.7	32.7	46.1	61.1	13.9
PI592761	ERNEST (sawfly resistant)	97.6	31.9	45.2	61.5	14.8
C982-324	RAMBO (mod.sawfly resistant)	95.5	29.4	43.4	61.0	14.5
CI 13596	FORTUNA (sawfly resistant)	95.5	32.2	43.0	60.7	14.8
BZ992588	CONAN (sawfly tolerant)	93.4	28.5	43.0	60.5	15.3
CI 17429	LEW (sawfly resistant)	97.6	34.6	41.0	60.9	14.2
EXPERIMENTAL MEANS		97.0	29.7	47.9	60.8	14.5
LSD (0.05)		3.2	1.8	5.0	0.5	.
C.V. 2: (S OF MEAN/MEAN)*100		1.1	2.1	3.7	0.3	.

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 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. 1991-2000.

2/ VARIETY or SELECTION	No. of YEARS TESTED 3/	1/ YIELD (Bushels Per Acre)							TEST WEIGHT (Pounds Per Bushel)								
		1996	1997	1998	1999 4/	2000	AVE. YEARS TESTED 3/	% of CHECK YIELD 5/	10-YR COMP. AVE. YIELD 6/	1996	1997	1998	1999 4/	2000	AVE. YEARS TESTED 3/	% of CHECK TEST WT 5/	10-YR COMP. AVE. TEST WT 6/
PI574642 McNEAL	8	29.1	45.5	51.5		52.7	46.8	123.2	47.5	59.2	56.4	58.4		59.9	58.6	97.9	58.6
PI483235 GLENMAN	8	30.1	41.5	47.6			46.4	122.1	47.0	59.0	55.9	56.5			57.5	96.2	57.6
CI 17430 NEWANA	9	29.9	43.8	51.5		48.5	46.7	121.3	46.7	61.5	56.9	58.1		61.1	59.0	98.6	59.0
PI527682 AMIDON	9	29.3	46.5	50.9		46.1	45.8	118.7	45.8	60.5	56.9	58.7		61.1	58.9	98.5	58.9
WB 936 WB 936 (P+)	5	24.2	45.0	49.3		50.0	45.3	118.0	45.5	60.2	56.0	57.4		60.6	58.5	97.3	58.2
PNR 2375 PIONEER 2375	4	27.7	41.6	51.9			43.8	117.7	45.3	61.1	57.0	59.5			59.4	99.0	59.3
WBEXPRES WB EXPRESS (P+)	5	27.3	42.6	49.2		48.6	44.8	116.8	45.0	59.7	56.4	58.1		60.3	58.8	97.8	58.6
PI607557 SCHOLAR (+)	4	28.8	45.9	50.8		47.3	43.2	115.8	44.6	60.7	58.5	59.5		61.8	60.1	100.1	59.9
PI549275 HI-LINE	9	29.7	42.3	53.1		49.0	44.5	115.4	44.5	59.8	55.5	58.0		60.5	58.2	97.2	58.2
WPB 926R WB 926R (P)	9	26.2	43.1	45.4		46.5	44.3	114.9	44.3	60.3	55.6	57.6		60.2	58.1	97.1	58.1
MTHW9420 MT8182/MT8289	4	27.3	42.2	51.2		49.6	42.6	114.2	44.0	60.4	55.4	57.7		60.3	58.5	97.3	58.3
PI531005 GRANDIN	9	24.7	43.0	49.5		48.0	43.7	113.5	43.7	60.9	55.7	57.8		61.5	58.7	98.1	58.7
PI592761 ERNEST (+)	6	28.4	41.8	49.5		45.2	41.8	111.7	43.1	61.4	56.2	59.4		61.5	59.7	101.7	60.9
TR983239 WB FERGUS (+)	5	24.4	44.1	44.4		49.5	42.6	111.1	42.8	61.3	56.4	58.1		60.5	59.1	98.2	58.8
ND 582 STOA	8	28.7	44.4	43.9			42.0	110.7	42.7	59.3	55.3	57.6			57.5	96.3	57.6
CI 17790 LEN	8	27.7	40.7	47.5			41.8	110.1	42.4	60.6	56.2	58.0			58.2	97.4	58.3
C982-324 WB RAMBO (P+)	9	25.5	38.0	46.2		43.4	41.5	107.7	41.5	61.2	58.0	58.9		61.0	59.3	99.1	59.3
ND 673 TRENTON	3	25.8	41.9	44.9			37.5	106.0	40.9	61.0	56.2	58.5			58.6	97.9	58.6
CI 17429 LEW	9	28.6	37.6	46.8		41.0	40.0	103.8	40.0	61.3	57.4	60.5		60.9	60.0	100.3	60.0
CI 13596 FORTUNA	9	27.3	36.8	42.1		43.0	38.5	100.0	38.5	62.0	56.9	60.6		60.7	59.9	100.0	59.9
MEANS (For Entries Listed)		27.5	42.4	48.4		47.2			43.8	60.6	56.4	58.4		60.8			58.8
7/ Growing Season Precipitation (in.)		3.62	10.48	Pndg		Pndg	7.78										
Soil PAW (in.) to SD @ Planting		6.01	4.87	Pndg		Pndg	6.02										
Total Plant Available Water (in.)		9.63	15.35	Pndg		Pndg	13.79										
Soil NO3 (lbs.) to SD at Planting		54	60	Pndg		Pndg	65.71										
SD (Sampling Depth in Inches)		48	48	48		48.0											
Fertilizer Applied	(# N)	66.0	66.0	66.0		70.0											
	(# P ₂ O ₅)	33.0	33.0	33.0		40.0											
	(# K ₂ O)	0.0	0.0	0.0		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 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. 2000. (Exp# 00-9955-SW)

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/ YIELD Bu/Ac	TEST WT Lbs/Bu	2/ PROTEIN %
PI574642	McNEAL	97.2	28.2	42.8	59.7	13.4
ID377S	ID377S (hard white)	94.1	27.7	41.8	60.4	13.1
CI 17430	NEWANA	95.8	25.6	41.7	61.3	12.4
PI531005	GRANDIN	94.8	29.1	41.2	61.3	13.5
ND 695	REEDER	97.2	26.7	41.2	62.1	13.4
MT 9955	MCNEAL/KS27//MCNEAL	97.6	25.6	40.7	59.7	12.8
WB 936	WESTBRED 936	92.0	23.5	40.4	60.6	14.5
PI549275	HI-LINE	95.8	26.0	40.0	60.9	13.4
WB 926	WESTBRED 926	93.8	26.1	39.7	60.1	13.8
MTHW9420	MT8182/MT8289 (hard white)	96.9	25.3	39.2	60.4	13.2
PI527682	AMIDON (mod.sawfly resist.)	98.6	30.5	38.9	61.2	13.2
TR983239	FERGUS	92.7	27.0	38.8	60.3	14.2
C982-324	RAMBO (mod.sawfly resistant)	96.9	26.5	38.5	61.2	13.1
MTHW9710	MT8182/FORT//POND/M(h-wh)	97.9	25.8	38.2	60.7	13.8
PI592761	ERNEST (sawfly resistant)	93.8	29.4	38.1	61.4	14.1
PI607557	SCHOLAR (mod.sawfly resist.)	98.6	29.3	37.7	61.6	13.6
BZ992588	CONAN (sawfly tolerant)	88.9	26.2	37.7	61.0	14.5
WBEXPRS	WESTBRED EXPRESS	95.1	24.0	37.4	59.9	13.8
CI 17429	LEW (sawfly resistant)	97.6	30.7	35.1	61.3	13.3
CI 13596	FORTUNA (sawfly resistant)	98.3	30.4	33.9	61.1	13.5
EXPERIMENTAL MEANS		95.7	27.2	39.1	60.8	13.5
LSD (0.05)		3.2	1.0	3.1	0.4	.
C.V. 2: (S OF MEAN/MEAN)*100		1.2	1.3	2.7	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 5. Five-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. 1996-2000.

2/ VARIETY or SELECTION	No. of YEARS TESTED	1/ YIELD (Bushels Per Acre)					TEST WEIGHT (Pounds Per Bushel)					5-YR COMP. AVE. YIELD 4/	5-YR COMP. TEST WT 4/				
		1996	1997	1998	1999	2000	AVE. YEARS TESTED	% of CHECK YIELD 3/	1996	1997	1998			1999	2000	AVE. YEARS TESTED	% of CHECK TEST WT 3/
PI574642 McNEAL	5	28.6	35.2	31.7	47.0	42.8	37.1	127.4	37.1	59.9	55.4	54.2	59.1	59.7	57.7	98.2	57.7
CI 17430 NEWANA	5	30.2	35.9	28.2	47.7	41.7	36.7	126.2	36.7	61.6	56.8	52.7	58.8	61.3	58.2	99.2	58.2
PI607557 SCHOLAR (+)	5	28.7	35.3	31.4	45.4	37.7	35.7	122.7	35.7	61.8	58.5	57.3	59.0	61.6	59.6	101.6	59.6
PI531005 GRANDIN	5	26.9	35.4	29.8	44.9	41.2	35.6	122.5	35.6	61.4	56.3	51.8	58.2	61.3	57.8	98.5	57.8
WB 936 WB 936 (P+)	5	26.9	37.9	30.1	42.6	40.4	35.6	122.3	35.6	60.5	56.6	52.8	58.0	60.6	57.7	98.3	57.7
PI527682 AMIDON	5	29.3	36.1	26.9	45.3	38.9	35.3	121.3	35.3	61.0	57.5	54.9	57.6	61.2	58.4	99.6	58.4
PI549275 HI-LINE	5	28.3	32.7	29.5	45.3	40.0	35.2	120.8	35.2	60.5	55.1	51.6	58.2	60.9	57.3	97.5	57.3
WBEXPRES WB EXPRESS (P+)	5	27.8	31.2	30.5	47.8	37.4	34.9	120.0	34.9	60.3	55.9	54.3	58.8	59.9	57.8	98.5	57.8
TR983239 WB FERGUS (+)	5	25.5	34.6	28.8	45.1	38.8	34.6	118.8	34.6	62.0	56.6	54.6	59.0	60.3	58.5	99.7	58.5
PNR 2375 PIONEER 2375	4	27.8	34.7	29.2	39.2		32.7	117.3	34.1	61.0	56.8	54.7	58.2		57.7	99.3	58.3
MTHW9420 MT8182/MT8289	5	27.0	33.6	29.7	40.1	39.2	33.9	116.5	33.9	61.1	55.8	53.3	58.0	60.4	57.7	98.3	57.7
PI592761 ERNEST (+)	5	27.1	34.8	27.3	40.4	38.1	33.5	115.3	33.5	61.5	57.1	54.8	57.7	61.4	58.5	99.7	58.5
WPB 926R WB 926R (P)	5	25.7	34.1	28.1	38.5	40.4	33.4	114.6	33.4	61.0	56.2	53.6	57.7	60.1	57.7	98.3	57.7
C982-324 WB RAMBO (P+)	5	26.6	27.8	27.4	44.0	38.5	32.9	112.9	32.9	61.6	57.6	56.6	59.5	61.2	59.3	101.0	59.3
PI483235 GLENMAN	3	28.8	33.8	23.9			28.8	112.1	32.6	58.7	56.1	52.6			55.8	96.2	56.4
ND 582 STOA	3	26.6	32.8	27.0			28.8	111.9	32.6	59.9	55.1	53.5			56.2	96.8	56.8
CI 17790 LEN	3	26.9	31.4	27.2			28.5	110.8	32.2	61.2	55.4	52.8			56.5	97.3	57.1
ND 673 TRENTON	3	25.9	33.4	25.5			28.3	109.9	32.0	60.7	56.8	54.2			57.2	98.6	57.9
CI 17429 LEW	5	27.1	30.7	24.7	38.4	35.1	31.2	107.2	31.2	61.3	57.1	56.5	59.7	61.3	59.2	100.8	59.2
CI 13596 FORTUNA	5	23.0	29.7	24.5	34.4	33.9	29.1	100.0	29.1	61.2	57.6	55.3	58.2	61.1	58.7	100.0	58.7
MEANS (For Entries Listed)		27.2	33.6	28.1	42.9	38.9			33.9	60.9	56.5	54.1	58.5	60.8			58.0
5/ Growing Season Precipitation (in.)		3.19	7.36	5.20	Pndg	Pndg	5.25										
Soil PAW (in.) to SD @ Planting		5.26	5.55	6.30	Pndg	Pndg	5.70										
Total Plant Available Water (in.)		8.45	12.91	11.50	Pndg	Pndg	10.95										
Soil NO3 (lbs.) to SD at Planting		40.0	40.0	130.0	Pndg	Pndg											
SD (Sampling Depth in Inches)		48.0	48.0	48.0	48.0	48.0											
Fertilizer Applied	(# N)	57.0	90.0	70.0	70.0	70.0											
	(# P ₂ O ₅)	28.0	48.0	40.0	40.0	40.0											
	(# K ₂ O)	0.0	21.0	25.0	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 selection decisions.

2/ P = Private Variety, + = Protected Variety

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

4/ 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.

5/ Seeding to 14 days prior to harvest maturity.

TABLE 6. 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. 2000. (Exp# 00-9957-SW)

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/ YIELD Bu/Ac	TEST WT Lbs/Bu	2/ PROTEIN %
MT 9955	MCNEAL/KS27//MCNEAL	98.6	25.4	33.3	53.3	18.3
WB 926	WESTBRED 926	97.6	24.6	32.1	55.3	17.4
MTHW9710	MT8182/FORT//POND/M(h-wh)	99.3	24.6	30.8	54.9	18.0
ND 695	REEDER	97.6	24.2	30.4	55.9	17.8
PI574642	McNEAL	98.6	24.5	29.8	53.1	18.5
PI527682	AMIDON (mod.sawfly resist.)	97.9	28.9	28.5	55.7	16.9
PI607557	SCHOLAR (mod.sawfly resist.)	98.6	27.0	28.5	56.3	19.0
PI592761	ERNEST (sawfly resistant)	99.0	25.9	28.3	56.8	17.8
ID377S	ID377S (hard white)	98.3	25.0	28.1	55.2	17.6
PI531005	GRANDIN	99.7	28.3	27.7	54.9	17.7
WB 936	WESTBRED 936	98.6	23.4	27.5	55.8	17.8
C982-324	RAMBO (mod.sawfly resistant)	97.9	24.9	27.5	57.0	17.1
TR983239	FERGUS	96.9	25.1	27.4	55.5	17.8
WBEXPRS	WESTBRED EXPRESS	98.6	23.8	27.3	52.8	17.4
PI549275	HI-LINE	98.3	23.9	27.3	54.2	18.0
CI 13596	FORTUNA (sawfly resistant)	96.2	27.7	26.1	55.7	17.5
BZ992588	CONAN (sawfly tolerant)	99.0	23.7	26.0	56.7	17.8
MTHW9420	MT8182/MT8289 (hard white)	99.3	23.5	25.9	53.8	17.4
CI 17430	NEWANA	98.6	22.7	25.3	55.0	17.3
CI 17429	LEW (sawfly resistant)	99.0	26.1	21.8	54.6	18.2
EXPERIMENTAL MEANS		98.4	25.2	28.0	55.1	17.8
LSD (0.05)		1.3	2.5	5.0	1.0	.
C.V. 2: (S OF MEAN/MEAN)*100		0.5	3.5	6.3	0.7	.

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 7. Three-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. 1998-2000.

2/ VARIETY or SELECTION	No. of YEARS TESTED 3/	1/ YIELD (Bushels Per Acre)			AVE. YEARS TESTED	% of CHECK YIELD 4/	3-YR COMP. AVE. YIELD 5/	TEST WEIGHT (Pounds Per Bushel)			AVE. YEARS TESTED	% of CHECK TEST WT 4/	3-YR COMP. TEST WT 5/
		1998	1999	2000				1998	1999	2000			
PI574642 McNEAL	3	33.6	35.7	29.8	33.0	111.3	33.0	47.0	52.2	53.1	50.8	94.0	50.8
PI527682 AMIDON	3	30.9	37.0	28.5	32.2	108.3	32.2	51.1	53.7	55.7	53.5	99.1	53.5
PI607557 SCHOLAR (+)	3	33.0	34.8	28.5	32.1	108.1	32.1	50.9	54.7	56.3	54.0	99.9	54.0
PI549275 HI-LINE	3	32.3	30.7	27.3	30.1	101.4	30.1	45.6	53.0	54.2	50.9	94.3	50.9
CI 17430 NEWANA	3	26.9	37.3	25.3	29.8	100.4	29.8	44.9	54.8	55.0	51.6	95.5	51.6
CI 13596 FORTUNA	3	31.5	31.7	26.1	29.7	100.2	29.7	51.9	54.4	55.7	54.0	100.0	54.0
PI592761 ERNEST (+)	3	30.2	29.9	28.3	29.5	99.2	29.5	50.4	53.3	56.8	53.5	99.1	53.5
C982-324 WB RAMBO (P+)	3	25.8	34.1	27.5	29.1	98.1	29.1	48.2	54.8	57.0	53.3	98.7	53.3
CI 17429 LEW	3	27.6	29.8	21.8	26.4	88.9	26.4	50.9	54.4	54.6	53.3	98.7	53.3
MEANS (For Entries Listed)		30.2	33.4	27.0			30.2	49.0	53.9	55.4			52.8
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									
SD (Sampling Depth in Inches)		48.0	48.0	48.0									
Fertilizer Applied	(# N)	70.0	70.0	65.0									
	(# P ₂ O ₅)	40.0	40.0	40.0									
	(# K ₂ O)	25.0	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 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 and 2000. Hail damage at the location confounded studies in 1999. Heat and drought stress was prevalent at critical growth stages during all three 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/ 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 Fortuna for the same years, and z = 3-Yr average yield or test weight for the check variety Fortuna.

6/ Seeding to 14 days prior to harvest maturity.

TABLE 8. Dryland Fallow Barley Cultivar Evaluation Nursery Grown Off-Station at the Leon Cederberg Farm, Turner. Northern Agricultural Research Center. Havre, Montana. 2000. (Exp# 00-3651-SB)

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/ YIELD Bu/Ac	TEST WT Lbs/Bu	PLUMP %	THIN %	2/ PROTEIN %
PI568246	Baronesse	96.53	23.2	81.2	52.9	94.6	2.0	13.0
MT960099	MT960099	95.17	23.2	80.3	53.5	88.6	4.1	12.7
BZ594-19	Xena	96.53	25.5	77.7	53.5	93.2	2.3	13.0
MT960228	MT960228	98.97	26.0	76.2	54.3	92.8	2.1	12.7
MT960100	MT960100	97.23	22.7	74.7	53.3	87.9	4.3	11.9
MTLB 5	MTLB 5	96.87	24.0	74.1	53.5	88.8	3.8	13.9
CI 15856	Lewis	95.17	25.4	73.5	54.9	91.6	3.4	13.7
MTLB 30	Valier	98.27	25.1	72.3	53.3	88.9	4.4	13.2
PI591823	Chinook	95.13	25.7	72.1	53.4	90.2	4.0	13.9
MTLB 13	MTLB 13	97.23	24.9	71.6	52.6	85.6	5.8	14.0
CI 15514	Hector	98.97	27.1	68.9	54.3	90.1	3.9	13.1
PI491534	Gallatin	96.53	25.7	68.7	53.9	89.0	4.1	13.6
SK 76333	Harrington	95.5	24.9	68.4	52.9	92.6	2.6	13.3
MT950186	MT950186	92.73	26.0	62.8	54.5	91.6	3.3	13.2
PI483237	Bowman	95.13	27.7	61.6	53.7	92.6	3.7	15.3
ND 9866	Stark	96.9	28.4	51.6	54.1	92.4	3.6	14.4
EXPERIMENTAL MEANS		96.43	25.3	71.0	53.7	90.7	3.6	13.4
LSD (0.05)		5.78	2.1	11.2	0.5	.	.	.
CV2: (S OF MEAN/MEAN)*100		2.07	2.9	5.5	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 9. 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. 1991-2000.

2/ VARIETY or SELECTION	No. of YEARS TESTED	1/ YIELD (Bushels Per Acre)							TEST WEIGHT (Pounds Per Bushel)								
		1996	1997	1998	1999	2000	AVE. YEARS TESTED	% of CHECK YIELD	10-YR COMP. AVE. YIELD	1996	1997	1998	1999	2000	AVE. YEARS TESTED	% of CHECK TEST WT	10-YR COMP. AVE. TEST WT
NS 78054 BARONESSE (P+)	9	43.4	56.7	74.1		81.2	65.4	117.6	65.4	48.9	46.5	49.3		52.9	48.6	98.7	48.6
PI483237 BOWMAN	9	49.4	65.1	69.8		61.6	60.5	108.8	60.5	50.0	51.3	52.0		53.7	50.8	103.3	50.8
ND 9866 STARK	9	39.3	62.8	75.0		51.6	59.3	106.6	59.3	49.7	49.9	52.4		54.1	50.8	103.3	50.8
N1123111 LOGAN	3	38.9	64.4	66.4			56.6	104.2	58.0	48.5	50.4	51.3		50.1	101.1		49.8
SK 76333 HARRINGTON	9	32.1	57.0	72.5		68.4	57.9	104.2	57.9	47.2	47.2	48.7		52.9	47.6	96.7	47.6
PI591823 CHINOOK (+)	9	39.0	54.8	68.7		72.1	57.3	103.1	57.3	47.8	47.7	51.3		53.4	48.6	98.8	48.6
PI491534 GALLATIN	9	36.5	59.4	70.7		68.7	56.8	102.2	56.8	48.4	48.5	51.0		53.9	49.6	100.7	49.6
CI 15856 LEWIS	9	40.9	54.9	66.6		73.5	56.2	101.0	56.2	49.1	48.4	52.3		54.9	49.9	101.5	49.9
CI 15514 HECTOR	9	43.8	54.4	64.6		68.9	55.6	100.0	55.6	47.9	49.1	51.5		54.3	49.2	100.0	49.2
MEANS (For Entries Listed)		40.4	58.8	69.8		68.3			58.6	48.6	48.8	51.1		53.8			49.4
7/ Growing Season Precipitation (in.)		3.62	9.88	Pndg		Pndg	7.59										
Soil PAW (in.) to SD @ Planting		6.01	3.96	Pndg		Pndg	5.89										
Total Plant Available Water (in.)		9.63	13.84	Pndg		Pndg	13.48										
Soil NO3 (lbs.) to SD at Planting		54	60	Pndg		Pndg	66										
SD (Sampling Depth in Inches)		48	48	48		48											
Fertilizer Applied	(# N)	66	66	66		70											
	(# P ₂ O ₅)	33	33	33		40											
	(# K ₂ O)	0	21	25		25											

Check Variety is Hector

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 Hector 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 Hector for the same years, and z = 10-Yr average yield or test weight for the check variety Hector.

7/ Seeding to 14 days prior to harvest maturity.

TABLE 10. Dryland Fallow Barley Cultivar Evaluation Nursery Grown Off-Station at the Flanaas/Lumsden Farm, Loring. Northern Agricultural Research Center. Havre, Montana. 2000. (Exp# 00-3655-SB)

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/ YIELD Bu/Ac	TEST WT Lbs/Bu	PLUMP %	THIN %	2/ PROTEIN %
CI 15856	Lewis	96.2	22.8	58.2	52.4	83.6	4.7	12.0
MT960099	MT960099	97.23	20.4	57.4	52.5	81.1	4.6	11.7
MT960100	MT960100	97.2	20.5	57.0	51.3	75.8	6.1	11.6
PI568246	Baronesse	96.87	19.6	56.7	50.8	87.2	3.8	11.0
MT960228	MT960228	94.8	21.7	56.1	51.6	79.2	5.3	11.4
MTLB 30	Valier	96.2	21.6	54.8	52.3	84.6	3.9	12.7
MT950186	MT950186	94.1	23.5	54.8	53.7	87.9	2.8	11.8
PI591823	Chinook	94.8	23.4	53.0	51.7	83.1	6.4	12.0
CI 15514	Hector	98.27	24.3	52.9	52.2	89.3	3.7	11.5
SK 76333	Harrington	96.17	22.6	52.8	50.9	87.9	4.3	12.5
MTLB 5	MTLB 5	96.9	21.1	52.7	52.3	78.1	6.5	11.9
MTLB 13	MTLB 13	96.5	20.3	52.1	51.2	80.0	5.5	12.3
BZ594-19	Xena	97.2	21.6	51.4	51.1	85.8	3.6	11.0
PI491534	Gallatin	95.13	23.8	51.2	51.9	85.6	4.3	12.3
PI483237	Bowman	92.37	24.2	46.7	52.6	94.3	2.0	13.3
ND 9866	Stark	94.8	25.8	44.2	53.2	93.1	2.3	12.1
EXPERIMENTAL MEANS		95.92	22.3	53.2	52.0	84.8	4.4	11.9
LSD (0.05)		3.21	2.2	4.9	0.5	.	.	.
CV2: (S OF MEAN/MEAN)*100		1.16	3.4	3.2	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 11. Five-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. 1996-2000.

2/ VARIETY or SELECTION	No. of YEARS TESTED	1/ YIELD (Bushels Per Acre)					TEST WEIGHT (Pounds Per Bushel)					5-YR COMP. AVE. YIELD 4/					
		1996	1997	1998	1999	2000	AVE. YEARS TESTED	% of CHECK YIELD 3/	5-YR COMP. AVE. YIELD 4/	1996	1997		1998	1999	2000	AVE. YEARS TESTED	% of CHECK TEST WT 3/
NS 78054 BARONESSE (P+)	5	38.1	47.6	46.9	79.5	56.7	53.8	110.6	53.8	48.0	46.9	44.6	49.4	50.8	47.9	97.2	47.9
N1123111 LOGAN	3	37.7	50.3	43.7			43.9	109.1	53.0	47.3	50.5	46.3			48.0	100.7	49.6
MT LB5 MT LB5	3			44.4	73.0	52.7	56.7	105.7	51.4			47.1	50.9	52.3	50.1	100.6	49.6
PI491534 GALLATIN	5	37.9	49.5	45.1	69.4	51.2	50.6	104.2	50.6	48.5	48.9	45.7	51.7	51.9	49.3	100.1	49.3
CI 15856 LEWIS	5	39.1	48.4	34.9	70.0	58.2	50.1	103.1	50.1	48.9	49.0	47.3	51.7	52.4	49.9	101.1	49.9
PI591823 CHINOOK (+)	5	38.8	47.1	41.1	64.8	53.0	49.0	100.7	49.0	47.0	48.6	46.7	52.0	51.7	49.2	99.8	49.2
CI 15514 HECTOR	5	39.3	43.0	38.4	69.6	52.9	48.6	100.1	48.6	48.6	48.6	45.9	51.3	52.2	49.3	100.0	49.3
SK 76333 HARRINGTON	5	36.5	44.6	37.7	69.0	52.8	48.1	99.0	48.1	47.5	48.3	45.6	49.6	50.9	48.4	98.1	48.4
PI483237 BOWMAN	5	36.4	40.1	39.1	67.7	46.7	46.0	94.6	46.0	49.8	50.2	47.2	52.0	52.6	50.4	102.2	50.4
ND 9866 STARK	5	37.2	38.1	43.2	60.8	44.2	44.7	92.0	44.7	49.6	50.2	46.4	50.9	53.2	50.1	101.5	50.1

MEANS (For Entries Listed) 37.9 45.4 41.4 69.3 52.0 49.5 48.4 49.0 46.3 51.1 52.0 49.4

5/ Growing Season Precipitation (in.) 3.19 6.79 5.20 Pndg Pndg 5.06
 Soil PAW (in.) to SD @ Planting 5.26 5.55 6.30 Pndg Pndg 5.70
 Total Plant Available Water (in.) 8.45 12.34 11.50 Pndg Pndg 10.76
 Soil NO3 (lbs.) to SD at Planting 40.0 40.0 130.0 Pndg Pndg
 SD (Sampling Depth in Inches) 48.0 48.0 48.0 48.0 48.0
 Fertilizer Applied (# N) 57.0 90.0 70.0 70.0 70.0
 (# P₂O₅) 28.0 48.0 40.0 40.0 40.0
 (# K₂O) 0.0 21.0 25.0 25.0 25.0

Check Variety is Hector

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 Hector yield or test weight for the same data years as those in which a given entry was tested.

4/ 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 Hector for the same years, and z = 5-Yr average yield or test weight for the check variety Hector.

5/ Seeding to 14 days prior to harvest maturity.

TABLE 12. ¹Dryland 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. 2000. (Exp# 00-3657-SB)

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	^{2/} YIELD Bu/Ac	TEST WT Lbs/Bu	PLUMP %	THIN %	^{3/} PROTEIN %
ND 9866	Stark	96.9	24.7	50.1	49.4	29.0	28.5	16.9
PI483237	Bowman	97.9	24.2	48.8	48.3	41.2	21.8	17.5
PI591823	Chinook	98.3	23.9	46.7	45.7	6.5	66.8	18.1
PI568246	Baronesse	98.6	22.0	46.7	44.9	9.4	63.2	18.0
CI 15514	Hector	97.9	23.6	46.3	45.7	4.6	66.7	18.8
PI491534	Gallatin	96.5	25.3	46.0	45.4	6.5	64.8	18.1
MT960099	MT960099	97.6	19.7	45.8	45.8	1.4	85.9	18.1
MT950186	MT950186	98.3	22.9	44.1	47.7	7.5	61.0	17.6
MTLB 13	MTLB 13	98.3	22.0	43.4	44.5	1.3	81.8	18.9
MT960228	MT960228	98.3	23.4	43.2	47.2	6.7	57.0	17.3
BZ594-19	Xena	97.6	23.8	42.4	45.9	9.7	54.2	17.4
SK 76333	Harrington	99.0	23.9	42.1	44.6	21.6	39.4	17.8
MTLB 5	MTLB 5	98.3	21.1	39.1	46.3	2.0	75.8	19.5
CI 15856	Lewis	98.6	22.1	39.0	46.3	7.2	64.1	19.0
MT960100	MT960100	98.3	20.3	38.7	45.3	2.6	76.1	19.1
MTLB 30	Valier	98.6	20.2	33.8	46.1	1.3	82.1	19.4
EXPERIMENTAL MEANS		98.1	22.7	43.5	46.2	9.9	61.8	18.2
LSD (0.05)		1.6	2.8	9.6	1.5	.	.	.
CV2: (S OF MEAN/MEAN)*100		0.6	4.2	7.7	1.1	.	.	.

1/ See separate MSU Entomology report to MWBC - Andrew Lenssen "Screening Barley Varieties for Resistance to Wheat Stem Sawfly"

2/ Volumetric yields are based on 48 lbs/bu as the standard test weight for barley.

3/ Protein values are reported on a 100% dry matter basis.

TABLE 13. Dryland Fallow Spring Durum Cultivar Evaluation Nursery Grown Off-Station in a Wheat Stem Sawfly Environment at McKeever Farm & Seed, Inc., Loma. Northern Agricultural Research Center. Havre, Montana. 2000. (Exp# 00-9857-SW)

ID	CULTIVAR or SELECTION	STAND %	1/ SAWFLY Rating	PLNT HT Inches	2/ YIELD Bu/Ac	TEST WT Lbs/Bu	3/ PROTEIN %
PI574642	MCNEAL (HRSW Check)	99.3	1.3	24.7	26.4	53.1	18.6
WBLAKER	LAKER	98.6	0.7	23.8	26.1	56.7	16.6
DT 433	MEDORA	98.3	0.7	29.3	22.5	57.0	19.3
CI 17789	VIC	99.7	0.0	28.6	22.4	58.3	17.4
PI478289	MONROE	96.2	0.7	28.6	22.4	56.9	17.9
D901442	LEBSOCK	95.8	0.0	24.7	21.2	57.8	18.3
NDMUNICH	MUNICH	96.5	0.0	24.4	20.9	55.7	19.9
CANPLENT	PLENTY	97.6	2.0	26.7	20.7	56.4	19.4
D901313	MOUNTRAIL	97.9	0.0	25.4	20.5	54.3	19.1
CI 15892	WARD	98.3	0.7	19.3	19.9	57.0	19.1
PI510696	RENVILLE	97.9	0.0	27.7	19.4	55.4	19.2
D87130	BEN	97.6	0.0	26.7	19.3	56.7	20.0
DT 380	SCEPTRE	96.9	0.3	24.0	18.4	54.8	19.2
CANKYLE	KYLE	95.5	0.0	27.9	18.0	56.9	19.9
NDBELZER	BELZER	97.9	0.3	25.1	17.6	54.8	18.5
D89135	MAIER	99.0	0.3	24.1	17.2	55.2	20.4
D91080	PLAZA	98.6	0.3	21.9	16.9	55.5	20.4
EXPERIMENTAL MEANS		97.7	0.4	25.5	20.6	56.0	19.0
LSD (0.05)		2.1	0.8	6.3	6.0	1.2	.
C.V. 2: (S OF MEAN/MEAN)*100		0.8	66.8	8.6	10.2	0.7	.

1/ Visual rating, percent of stems cut (0=0-25, 1=26-50, 2=51-75, 3=>75)

2/ Volumetric yields are based on 60 lbs/bu as the standard test weight for durum.

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

TABLE 14. Three-Year Yield and Test Weight Summary on Selected Entries from Dryland Fallow Spring Durum Variety Nurseries Grown Off-Station in a Wheat Stem Sawfly Environment at McKeever Farm & Seed, Inc., Loma. Northern Agricultural Research Center. Havre, Montana. 1998-2000.

2/ VARIETY or SELECTION	No. of YEARS TESTED 3/	1/ YIELD (Bushels Per Acre)						TEST WEIGHT (Pounds Per Bushel)					
		1998	1999	2000	AVE. for YEARS TESTED	% of CHECK YIELD 4/	3-YR COMP. AVE. YIELD 5/	1998	1999	2000	AVE. for YEARS TESTED	% of CHECK TEST WT 4/	3-YR COMP. AVE. TEST WT 5/
PI574642 McNEAL (HRSW Check)	3	32.0	28.9	26.4	29.1	100.0	29.1	47.0	51.7	53.1	50.6	100.0	50.6
WPBLAKER LAKER	3	26.4	26.8	26.1	26.4	90.8	26.4	49.8	55.3	56.7	53.9	106.6	53.9
CI 17789 VIC	3	28.8	26.8	22.4	26.0	89.4	26.0	52.0	55.5	58.3	55.3	109.2	55.3
PI478289 MONROE	3	31.1	23.4	22.4	25.6	88.0	25.6	51.0	53.5	56.9	53.8	106.4	53.8
CANPLENT PLENTY	3	25.1	27.5	20.7	24.4	84.0	24.4	49.5	54.4	56.4	53.4	105.6	53.4
CANKYLE KYLE	3	26.6	28.4	18.0	24.3	83.6	24.3	51.9	55.3	56.9	54.7	108.1	54.7
DT 380 SCEPTRE	3	27.3	26.9	18.4	24.2	83.2	24.2	48.9	53.7	54.8	52.5	103.7	52.5
NDMUNICH MUNICH	3	25.1	26.3	20.9	24.1	82.8	24.1	48.4	53.7	55.7	52.6	103.9	52.6
DT 433 MEDORA	3	25.8	23.9	22.5	24.0	82.6	24.0	49.6	53.8	57.0	53.5	105.7	53.5
D87130 BEN	3	25.6	23.5	19.3	22.8	78.3	22.8	50.8	54.2	56.7	53.9	106.5	53.9
CI 15892 WARD	3	22.9	22.8	19.9	21.9	75.1	21.9	49.9	54.6	57.0	53.8	106.4	53.8
PI510696 RENVILLE	3	24.4	20.3	19.4	21.4	73.4	21.4	49.8	54.1	55.4	53.1	104.9	53.1

MEANS (For Entries Listed)	26.8	25.4	21.4		24.5	49.9	54.1	56.2		53.4
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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
SD (Sampling Depth in Inches)	48.0	48.0	48.0
Fertilizer Applied	(# N)	70.0	70.0
	(# P ₂ O ₅)	40.0	40.0
	(# K ₂ O)	25.0	25.0

Check Variety is HRS Wheat `McNeal'

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 and 2000. Hail damage at the location confounded studies in 1999. Heat and drought stress was prevalent at critical growth stages during all three 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 McNeal 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 McNeal for the same years, and z = 3-Yr average yield or test weight for the Hard Red Spring Wheat check variety `McNeal'.

6/ Seeding to 14 days prior to harvest maturity.