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 the five-county area most closely served by Northern Agricultural Research Center. Winter wheat, spring wheat, barley, durum and oat production together in the five counties (Blaine, Chouteau, Hill, Liberty and Phillips) represents 29.4 percent of the 2006-2010 statewide total (43 percent and 19 percent 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 that 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 improved 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.

METHODS:

Six, standard, off-station variety performance trials were conducted in 2011 on chemical fallow at four locations in three northern Montana counties.

Dryland Winter Wheat Trials:

1. Leon Cederberg Farm, Blaine County	(3NE Turner)	13-36N-25E
2. McKeever Farm & Seed Inc., Chouteau County	(12N Loma)	20-27N-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

Dryland Spring Durum Trials:

1. Leon Cederberg Farm, Blaine County	(3NE Turner)	13-36N-25E
2. Flansaas/Lumsden Farm, Phillips County	(1SW Loring)	24-35N-29E

All trials were seeded in replicated, 3-row, 22-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. Beginning with spring planting in 2005, all off-station trials were planted with 'Haybuster' openers further modified to provide narrow, paired-row seed placement for enhanced seed/fertilizer separation. A randomized complete block design was standard for all trials with three replications. In 2011, a 'Wintersteiger Classic' plot combine, funded in part by Montana Wheat and Barley Committee was used to harvest each 3-row plot. Beginning in 1997, a 'Wintersteiger 1541-21' plot combine, was used to harvest each plot, and prior to that a 'Hege 125C' plot combine was used. Both of these combines were also funded in part by MWBC. 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 with the current year data tables.

RESULTS:

Data details for individual trials conducted from 1982-2010 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 2011 ranged from fair to excellent across North Central Montana. At Havre, total annual growing season precipitation (9/1/10 through 8/31/11) was 15.45 inches, 29.6 percent more than the average for all years since 1916. April 1 through July 31 precipitation was 8.75 inches or 129 percent of the 96-year average. Heat units expressed as "Growing Degree Days" (GDD, base 50) from May through July were 1092, 85 percent of the average for the last 61 years (1951-2011). The last spring frost and first fall frost of 2011 were right in line with the 96–year average resulting in 129 frost-free days. Although the thermometer reached 32 degrees on September 20, annual plants remained green until it reached 29 degrees on October 14. At 4.84 inches, March 2011 through May 2011 precipitation was 146 percent of the long-term average. The minimum winter temperature was -37 degrees F on February 1 and 2. Overall, the growing season was slightly cooler than normal. Crop outlook was initially good with adequate fallow-stored soil moisture and generally favorable conditions. Spring crop performance in some areas was poorer than expected due to early season cool temperatures, followed by some untimely heat, whereas winter wheat performance was very good across locations. The April through July growing season saw an average daily temperature at 55.2 degrees F, 1.9 degrees below normal. July and August average temperatures were 1.3 percent higher than normal with the high for 2011 recorded on July 19 at 101 degrees F. There were 32 days 90 degrees F or above, and only one day with temperatures 100 degrees F or above. June through October all registered days greater than 90 degrees. Overall, April, May, June and July were cooler than normal resulting in delayed heading and maturity of cereal crops. With those delays, higher temperatures in August had adverse affects on yield and test weight of some crops.

Yield and test weight comparisons with long-term comparable averages varied according to crop and location. On-station WW at Havre was not harvested due to poor stands throughout the trial; SW had increased yields (111 percent of the 10-year comparable average of 36.7 bu/ac) and increased test weights (2.6 lbs more than the 10-year comparable average of 58.0 lbs/ac); BLY had increased yields (135 percent of the 10-year comparable average of 57.5 bu/ac) and increased test weights (3.1 lbs more than the 10-year comparable average of 49.9 lbs/bu).

The Cederberg location, has been in place since 1982, and also featured “fertilized vs. unfertilized” spring wheat variety performance evaluations (1994-1998). The Peterson location (North Havre) was added in 2005 due to the presence of significant sawfly pressure, but dropped in 2010 due to the lack of sawfly infestation. The Flansaas/Lumsden location replaced the 10-year Solberg location at Dodson (1986-1995). The McKeever location replaced the former, long-term Myers location (Big Sandy, 1988-1997) and the spring wheat evaluation there was suspended in 2009.

Off-station cropping environments were very favorable in 2011. The Loma location had adequate precipitation early in the growing season, good stored soil water and favorable growing conditions for the production of the winter wheat crop. Compared to ten-year Loma comparable average WW yields, 2011 yields were down 5.6 percent with higher than average test weights. The Turner location had higher than normal precipitation, however the rainfall was untimely and not spread across critical growth stages. Yields of the SW were down 9 percent from the ten-year comparable average with test weights up 2.9 lbs/bu. DURUM yields were 13.5 percent lower than the nine-year Turner comparable average with test weights up 2.4 lbs/bu. The Loring location had higher than normal precipitation and good stored soil water and generally favorable growing conditions for the production of spring cereal crops. Loring SW yields were 5.7 percent higher than the ten-year comparable average with test weights up 3.2 lbs/bu. Sawfly pressure on winter wheat at Loma was moderate, averaging 18.5 percent cutting, while cutting at Turner, a new winter wheat site established in 2011, averaged 12.8 percent cut. Sawfly pressure on spring wheat at Turner was high at 41.8 percent cut and at Loring was moderate at 14.4 percent cut. Protein levels for appropriately fertilized wheat and durum were generally lower than expected mainly due to the large amounts of precipitation early in the growing season likely washing applied fertility out of the root zone.

Stand percent, plant height, yield, moisture, test weight, protein and sawfly cutting data, where appropriate, for the 2011 Cederberg (Turner) dryland winter wheat trial data are summarized in Table 1 and the 2011 McKeever (Loma) dryland winter wheat trial are summarized in Table 2. Multi-year yield and test weight summary data for the McKeever location for 2002-2011 are presented in Table 3 with sawfly data presented in Table 4. Because this was the first

winter wheat trial grown at Turner, no multi-year data will be available until crop year 2013.

Stand percent, plant height, yield, moisture, test weight, protein and sawfly cutting data, where appropriate, for the 2011 Cederberg (Turner) and Flansaas/Lumsden (Loring) dryland spring wheat trials are summarized in Tables 5 and 8, respectively. Multi-year yield, test weight and sawfly summaries for selected spring wheat entries at the Cederberg and Flansaas/Lumsden locations are presented in Tables 6, 7, 9 and 10, respectively.

Stand percent, plant height, yield, moisture, test weight, protein and sawfly cutting, where appropriate, for the 2011 Cederberg (Turner) and the newly added Flansaas/Lumsden (Loring) dryland durum trials are summarized in Tables 11 and 14, respectively. Low yields are not typical for 'Normanno', however in 2011 yields suffered for this variety at both locations due to poor seed germination. The evaluation of durum varieties was added at the Cederberg location in 2002, the Flansaas/Lumsden location in 2011, and at the McKeever location in 2003; however durum evaluation at the McKeever location was suspended in 2009. Multi-year yield and test weight summaries for selected durum entries at the Cederberg location are presented in Tables 12 and 13, respectively.

FUNDING SUMMARY:

Expenditure information for grant index 4W3635 is to be provided by Montana State University, Office of Sponsored Programs. There is no other grant support for this project.

MWBC FY2012 GRANT SUBMISSION PLANS:

It is planned to submit this project for funding consideration in the next fiscal year.

With budget and other resources allowing, it is planned to continue off-station cereal variety investigations in the five-county area. This work has been strongly supported by producers near each of the locations, and by the Northern Ag Research Center Advisory Council. 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 outstanding producer cooperation and support. However, sawfly-resistant variety development efforts were initiated in 1997 involving establishment and maintenance of 2,000-3,000 plots on the McKeever Farm (Loma) only a few miles away where conditions (other than sawfly pressure) were quite similar. Thus, the Big Sandy location was put on hold; and standard off-station winter wheat, spring wheat, durum and barley variety trials were established at the Loma site. A steady reduction in sawfly pressure at the Loma location later resulted in relocation of the sawfly-resistant variety development work to northern Hill County as of the 2005 crop year. It was our intent to continue standard off-station variety evaluation work at Loma until at least ten years of performance data were collected, which occurred in 2008 for SW and BLY. Due to the ten years of data collection along with the workload associated with maintaining both winter and spring crops at the same location, spring variety trials were dropped from the Loma location in 2009. This continues to be an excellent location with outstanding producer cooperation and support.

With ever changing sawfly pressure, it is planned to continue winter wheat variety investigations at the McKeever (Loma) location and begin winter wheat investigations at the Cederberg (Turner) location while efforts at the Peterson (North Havre) location were suspended in 2010. It is also planned to continue off-station spring wheat and durum variety evaluations at the Cederberg (Turner) and Flansaas/Lumsden (Loring) locations. All spring cereal investigations were suspended at the Peterson location. In 2010, off-station spring barley variety evaluations were discontinued at the Cederberg (Turner) and Flansaas/Lumsden (Loring) locations until wildlife depredation issues can be adequately dealt with. The Loring location is entering its' seventeenth 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. 2011 marked 24 years at the present Turner site (plus 5 years on a different soil series at a site nearby). Double plantings, initiated in 1994 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 also excellent.

Data processed by Northern Agricultural Research 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.

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 would otherwise result in less than timely planting and maintenance of certain sites.

TABLE 1. Dryland Fallow Winter Wheat Cultivar Evaluation Nursery Grown Off-Station at the Leon Cederberg Farm, Turner. Northern Agricultural Research Center. Havre, Montana. 2011. (Exp# 11-3851-WW)

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/ YIELD Bu/Ac	MOISTURE %	TEST WT Lbs/Bu	2/ PROTEIN %	3/ SAWFLY %
Accipiter	CDC Raptor/CDC Falcon	93.5	28.3	47.4	10.1	60.4	11.5	26.7
AP 503 CL2	AgriPro, 2007	89.8	27.3	42.2	10.5	63.2	10.0	23.3
Bearpaw	DMS/Rampart//Pronghorn/3/2*Rampart	91.0	27.1	**51.7***	10.2	61.2	10.5	3.7
Bynum (CL)	Montana/WestBred, 2005	93.2	31.9	48.0	10.0	60.5	13.4	8.3
CDC Falcon	Sask/WestBred, 1999	93.5	28.3	**54.9***	10.3	59.9	11.6	11.7
Decade	Montana/North Dakota, 2010	94.8	25.4	50.0	10.4	61.9	11.6	21.7
Genou	Montana, 2004	96.0	31.8	**51.7***	10.5	60.9	11.0	7.0
Jagalene	AgriPro, 2002	90.7	29.0	46.1	10.5	63.2	10.5	25.0
Jerry	North Dakota, 2001	95.7	29.9	**52.2***	10.3	60.9	11.2	20.0
Judee	93X312E14/NuHorizon	91.7	27.1	**52.6***	10.4	61.4	10.3	1.0
Ledger	WestBred, 2004	89.2	27.2	41.2	10.3	60.8	10.9	11.7
MT0871	MT9982//MTW0072/NW97S151	93.2	26.9	**53.6***	10.1	61.1	10.5	18.3
MTCL1003	Jerry/CDC Teal 11A//MTCL0325	93.2	30.3	47.2	10.2	61.3	10.2	1.0
MTCL1067	Yellowstone*4/3/MTCL01158/CDC Teal 11A//Jag	92.3	26.9	46.6	10.5	61.8	10.0	20.0
MTCL1068	Yellowstone*4/3/MTCL01158/CDC Teal 11A//Jag	88.9	27.1	42.0	10.2	60.8	10.1	20.0
MTS0808	MT9908//Nuplains/MTS9862	89.2	23.2	38.1	10.3	62.5	10.5	1.0
MTS0826	MT9524/G15048//Rampart	94.1	28.6	**53.0***	10.1	60.9	11.8	1.0
MTS0832	92X73E70/MTW9911	95.1	29.4	**59.2****	10.3	60.6	11.0	3.7
Norris (CL)	Montana/WestBred, 2005	90.7	29.0	44.2	10.2	62.6	9.8	30.0
Pryor	WestBred, 2002	88.0	27.8	**53.1***	10.3	61.2	10.6	13.7
Rampart	Montana, 1996	93.5	27.8	43.6	10.5	62.1	10.6	1.0
Wahoo	Nebraska, 2001	94.4	30.2	**58.8***	10.1	58.8	11.9	15.0
WB-Quake	Rampart/Kestrel	91.7	27.8	**54.0***	10.2	60.7	11.6	2.3
Yellowstone	Montana 2005	93.5	28.6	49.7	10.2	61.3	11.1	20.0
EXPERIMENTAL MEANS		92.4	28.2	49.2	10.3	61.3	10.9	12.8
LSD (0.05)		5.5	3.7	8.1	0.2	1.2	-	9.7
C.V.%		3.6	8.0	10.1	1.4	1.1	-	45.9
P-VALUE (Varieties)		0.1877	0.0144	<0.0001	0.0005	<0.0001	-	<0.0001

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.
3/ Sawfly rating is reported as the percentage of cut stems.
** = indicates highest value within a column.
* = indicates varieties with values equal to highest variety within a column based on Fisher's protected LSD (p=0.05).

Site Resource & Management Data: (Exp# 11-3851-WW)							
Field			SaltHaz (MMHOS/cm) 6-24	0.42		Dry Surf Soil (in.) @Plnt'g	0.25
Quarter	SE		S (ppm) 0-24	7		2" Soil Temp (°F) @ Plnt'g	71
Section	13		Zn (ppm) 0-6	1.09		4" Soil Temp (°F) @ Plnt'g	69
Township	36N		Fe (ppm) 0-6	42.80		Fertilizer Formulation	Gran.Blend
Range	25E		Mn (ppm) 0-6	22.31		Fertilizer Placement	Bnd at Plntg
Latitude	N48 52.593'		Cu (ppm) 0-6	0.65		Fert. Rate (lbs/ac) N	70
Longitude	W108 23.588'		CEC 0-6	8.20		Fert. Rate (lbs/ac) P2O5	40
Soil Series	Telstad Joplin		Soil Texture 0-6	n/a		Fert. Rate (lbs/ac) K2O	25
pH 0-6	5.7		Soil Texture 6-24	n/a		Herbicide App. Date	none
Org.Matter (%) 0-6	1.8		Soil Texture 24-36	n/a		Herbicide Product	n/a
N (lbs/ac) 0-6	11.5		Soil Texture36-48	n/a		Herbicide Rate (/ac)	n/a
N (lbs/ac) 6-24	13.5		Init PAW (in.) 0-6"	0.99		Precip (in.) Plnt'g-Harvest	8.29*
N (lbs/ac) 24-36	7.5		Init PAW (in.) 6-24"	3.31		Precip (>.1) Plnt'g-Harvest	7.74*
N (lbs/ac) 36-48	22		Init PAW (in.) 24-36"	1.82		Harvest Date	8/25
N (lbs/ac) 0-48	54.5		Init PAW (in.) 36-48"	2.12		Rooting Depth (in.)	44"
P (ppm) Olsen 0-6	29		Init PAW (in.) 0-48"	8.24		Post PAW (in.) 0-6"	0.80
K (ppm) 0-6	344		Cropping System	NT-ChmFlw		Post PAW (in.) 6-24"	1.63
Ca (ppm)	1020		Previous Crop	Durum		Post PAW (in.) 24-36"	0.84
Mg (ppm) 0-6	258		Planting Date	9/30		Post PAW (in.) 36-48"	1.03
Na (ppm) 0-6	11		Planting Depth (in.)	1.3		Post PAW (in.) 0-48"	4.29
SaltHaz (MMHOS/cm) 0-6	0.24		Moist Soil Depth @Plnt'g	48+		Precip (>.1) Hvst-Post	0

* Precip from May to Harvest

TABLE 2. Dryland Fallow Winter Wheat Cultivar Evaluation Nursery Grown Off-Station at McKeever Farm & Seed, Inc., Loma. Northern Agricultural Research Center. Havre, Montana. 2011. (Exp# 11-3853-WW)

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/ YIELD Bu/Ac	MOISTURE %	TEST WT Lbs/Bu	2/ PROTEIN %	3/ SAWFLY %
Accipiter	CDC Raptor/CDC Falcon	96.9	34.5	53.2	8.5	59.1	9.6	28.3
AP 503 CL2	AgriPro, 2007	86.4	34.4	46.7	8.6	60.2	10.1	33.3
Bearpaw	DMS/Rampart//Pronghorn/3/2*Rampart	93.2	35.4	51.2	8.5	59.8	9.9	10.0
Bynum (CL)	Montana/WestBred, 2005	91.4	39.8	51.2	8.5	61.1	9.9	13.3
CDC Falcon	Sask/WestBred, 1999	93.5	35.8	57.1	8.7	60.3	9.4	15.0
Decade	Montana/North Dakota, 2010	96.0	35.1	55.2	8.5	59.6	10.1	13.3
Genou	Montana, 2004	97.2	38.6	49.1	8.6	59.7	9.8	21.7
Jagalene	AgriPro, 2002	92.3	35.8	52.5	8.7	61.3	9.6	28.3
Jerry	North Dakota, 2001	96.0	38.5	53.6	8.6	59.2	9.9	30.0
Judee	93X312E14/NuHorizon	93.8	36.7	62.6	8.9	61.5	9.4	10.0
Ledger	WestBred, 2004	91.7	35.0	49.2	8.7	60.4	9.1	26.7
MT0871	MT9982//MTW0072/NW97S151	89.8	34.7	61.4	8.4	60.3	11.8	18.3
MTCL1003	Jerry/CDC Teal 11A//MTCL0325	96.0	36.2	57.0	8.4	60.4	11.1	5.0
MTCL1067	Yellowstone*4/3/MTCL01158/CDC Teal 11A//Jag	94.4	38.0	62.4	8.6	60.0	9.7	18.3
MTCL1068	Yellowstone*4/3/MTCL01158/CDC Teal 11A//Jag	91.4	38.7	63.0	8.4	58.8	9.7	18.3
MTS0808	MT9908//Nuplains/MTS9862	96.3	36.4	60.8	8.4	59.3	11.1	5.0
MTS0826	MT9524/G15048//Rampart	96.3	38.1	**72.4****	8.4	60.6	10.3	8.3
MTS0832	92X73E70/MTW9911	92.9	36.9	53.9	8.7	58.3	8.7	5.0
Norris (CL)	Montana/WestBred, 2005	91.0	39.7	45.2	8.4	60.1	9.3	45.0
Pryor	WestBred, 2002	93.2	30.8	55.3	8.3	58.8	10.5	6.7
Rampart	Montana, 1996	94.8	38.8	55.0	8.7	60.7	10.3	10.0
Wahoo	Nebraska, 2001	93.5	35.7	50.3	8.1	55.6	8.8	38.3
WB-Quake	Rampart/Kestrel	95.1	35.0	**64.9***	8.5	61.0	10.8	15.0
Yellowstone	Montana 2005	88.3	35.3	62.2	8.4	60.3	10.7	21.7
EXPERIMENTAL MEANS		93.4	36.4	56.1	8.5	59.8	10.0	18.5
LSD (0.05)		6.5	3.2	7.7	0.3	1.9	-	11.7
C.V.%		4.2	5.4	8.4	2.3	2.0	-	38.4
P-VALUE (Varieties)		0.1317	0.0002	<0.0001	0.0099	0.0003	-	<0.0001

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.
3/ Sawfly rating is reported as the percentage of cut stems.
** = indicates highest value within a column.
* = indicates varieties with values equal to highest variety within a column based on Fisher's protected LSD (p=0.05).

Site Resource & Management Data: (Exp# 11-3853-WW)							
Field			SaltHaz (MMHOS/cm) 6-24	0.45		Dry Surf Soil (in.) @Plnt'g	0.50
Quarter	NE		S (ppm) 0-24	9		2" Soil Temp (°F) @ Plnt'g	68
Section	29		Zn (ppm) 0-6	1.11		4" Soil Temp (°F) @ Plnt'g	65
Township	27N		Fe (ppm) 0-6	25.30		Fertilizer Formulation	Gran.Blend
Range	10E		Mn (ppm) 0-6	19.08		Fertilizer Placement	Bnd at Plntg
Latitude	N48 4' 20.6"		Cu (ppm) 0-6	0.94		Fert. Rate (lbs/ac) N	70
Longitude	W110 27'52.3"		CEC 0-6	13.20		Fert. Rate (lbs/ac) P2O5	40
Soil Series	Telstad Joplin		Soil Texture 0-6	n/a		Fert. Rate (lbs/ac) K2O	25
pH 0-6	6.7		Soil Texture 6-24	n/a		Herbicide App. Date	none
Org.Matter (%) 0-6	1.8		Soil Texture 24-36	n/a		Herbicide Product	n/a
N (lbs/ac) 0-6	7.5		Soil Texture36-48	n/a		Herbicide Rate (/ac)	n/a
N (lbs/ac) 6-24	6		Init PAW (in.) 0-6"	1.21		Precip (in.) Plnt'g-Harvest	9.8*
N (lbs/ac) 24-36	5		Init PAW (in.) 6-24"	3.82		Precip (>.1) Plnt'g-Harvest	8.77*
N (lbs/ac) 36-48	7.5		Init PAW (in.) 24-36"	2.25		Harvest Date	8/24
N (lbs/ac) 0-48	26		Init PAW (in.) 36-48"	2.32		Rooting Depth (in.)	48"
P (ppm) Olsen 0-6	34		Init PAW (in.) 0-48"	9.60		Post PAW (in.) 0-6"	0.40
K (ppm) 0-6	357		Cropping System	NT-ChmFlw		Post PAW (in.) 6-24"	1.98
Ca (ppm)	1656		Previous Crop	WW		Post PAW (in.) 24-36"	1.72
Mg (ppm) 0-6	475		Planting Date	9/29		Post PAW (in.) 36-48"	1.87
Na (ppm) 0-6	16		Planting Depth (in.)	1.5		Post PAW (in.) 0-48"	5.98
SaltHaz (MMHOS/cm) 0-6	0.42		Moist Soil Depth @Plnt'g	48+		Precip (>.1) Hvst-Post	0

* Precip from May to Harvest

TABLE 3. Nine-Year Yield and Test Weight Summary of Selected Entries from Dryland Fallow Winter Wheat Variety Nurseries Grown Off-Station at McKeever Farms, Loma. Northern Agricultural Research Center. Havre, Montana. 2002-2011. (Exp# 3853-WW)

2/ VARIETY or SELECTION		No. of YEARS TESTED 3/	1/ YIELD (Bushels Per Acre) 2007	2008	2009	2010	2011	AVE. for YEARS TESTED 3/	% of CHECK YIELD 4/	**9-YR COMP. AVE. YIELD 5/**	TEST WEIGHT (Pounds Per Bushel) 2007	2008	2009	2010	2011	AVE. for YEARS TESTED 3/	% of CHECK TEST WT 4/	**9-YR COMP. AVE. TEST WT 5/**
PI619098	WAHOO (++)	8	73.9	75.5	54.9	68.6	50.3	66.9	100.7	**65.2**	59.0	55.8	57.8	51.2	55.6	57.4	98.7	**57.2**
MT00159	YELLOWSTONE (++)	9	65.5	76.5	44.6	66.6	62.2	64.8	100.0	**64.8**	58.6	55.1	59.1	52.7	60.3	57.9	100.0	**57.9**
MT0552	DECADE (++)	4		77.0	48.6	61.5	55.2	60.6	97.0	**62.8**		56.8	59.5	53.7	59.6	57.4	101.0	**58.5**
JAGALENE	JAGALENE (P+)	8	62.9	79.5	49.4	57.0	52.5	63.4	95.4	**61.8**	62.2	57.9	59.9	55.0	61.3	60.6	104.2	**60.3**
PI555458	PROMONTORY	8	64.4	75.9	48.2	58.6		62.0	95.2	**61.7**	61.9	59.7	60.1	54.2		59.6	103.4	**59.9**
S94-4	CDC FALCON (P+)	9	67.5	78.6	45.8	56.0	57.1	61.4	94.8	**61.4**	59.1	56.1	57.8	52.3	60.3	58.0	100.1	**58.0**
MTCL0306	HYALITE (P, CL++)	6	61.7	78.6	45.7	46.4		59.8	94.2	**61.0**	60.2	58.3	59.7	52.6		59.2	102.3	**59.3**
MTS0713	JUDEE (saw fly res)(++)	3			45.2	55.1	62.6	54.3	93.9	**60.8**			60.6	53.0	61.5	58.4	101.8	**58.9**
MTW 9441	NUSKY (HW)	7	62.5	75.1	44.2			60.7	93.5	**60.6**	59.3	57.4	59.9			59.3	101.6	**58.8**
CI 17860	NEELEY	8	60.4	62.4	42.3	56.1		60.8	93.3	**60.5**	57.9	55.0	58.2	52.4		57.4	99.7	**57.7**
CI 17879	ROCKY (P)	7	68.2	71.7	41.7			60.2	92.7	**60.1**	61.2	58.0	60.2			60.4	103.5	**60.0**
BZ96-919	PRYOR (P+)	9	59.3	66.4	45.1	51.8	55.3	60.0	92.7	**60.0**	57.8	54.6	58.9	53.2	58.8	57.7	99.7	**57.7**
MTCL0316	NORRIS (P, CL++)	7	61.2	70.3	41.2	52.8	45.2	57.6	91.1	**59.0**	60.4	57.6	60.5	52.4	60.1	59.5	102.2	**59.2**
BZ022060	CARTER (P++)	3		63.9	45.7	59.3		56.3	90.0	**58.3**		56.8	58.3	54.7		56.6	101.8	**58.9**
BZ96-788	LEDGER (P+)	6	61.5	62.3	46.9	62.2	49.2	56.2	88.7	**57.4**	60.6	57.5	58.6	54.5	60.4	58.8	101.8	**59.0**
ND9257	JERRY	9	60.7	74.3	41.0	41.9	53.6	56.7	87.6	**56.7**	58.3	57.8	57.5	49.7	59.2	57.6	99.5	**57.6**
PI517194	TIBER	6	58.7	60.3				59.3	86.9	**56.3**	59.4	57.4				59.5	102.3	**59.3**
MTCL0318	BYNUM (sf res)(P, CL++)	7	59.6	65.5	37.3	60.4	51.2	54.6	86.3	**55.9**	60.5	59.5	58.4	55.2	61.1	59.5	102.2	**59.2**
MTS 0031	GENOU (saw fly res)(++)	9	58.5	58.5	42.8	51.6	49.1	55.6	85.8	**55.6**	58.6	55.4	57.4	51.9	59.7	57.8	99.9	**57.8**
DH001819	ACCIPITER	3			46.3	46.8	53.2	48.8	84.4	**54.7**			59.3	51.1	59.1	56.5	98.5	**57.0**
PI593889	RAMPART (saw fly res)	9	60.0	55.9	41.1	52.7	55.0	53.7	82.8	**53.7**	59.5	57.3	58.9	52.8	60.7	58.6	101.3	**58.6**
MEANS (For Entries Listed)			62.7	69.9	44.9	55.9	53.7			**59.4**	59.7	57.0	59.0	52.9	59.8			**58.6**
7/ Growing Season Precipitation (in.)			6.9	8.9	n/a	n/a	9.4	7.5										
Soil PAW (in.) to SD @ Planting			n/a	10.5	10.1	7.5	9.6	7.9										
Total Plant Available Water (in.)			n/a	19.4	10.1	7.5	19.4	12.7										
Soil NO3 (lbs.) to SD at Planting			n/a	300	82	36	26	201										
Fertilizer Applied	(# N)		70	70	70	70	70	70										
	(# P_2O_5)		40	40	40	40	40	40										
	(# K_2O)		25	25	25	25	25	25										

Long-term check variety is Yellowstone.

1/ See MCES Bulletin 1098 or the Plant Sciences & Plant Pathology website at http://plantsciences.montana.edu/ for evaluation of other important variety performance characteristics to include protein, quality, winter hardiness, disease resistance, etc. before making cultivar selecton decisions.

2/ P = Private Variety, + = Protected Variety, ++ = PVP Title 5 or Title 5 Pending, HW = Hard White Wheat, CL = Clearfield Line.

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

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

5/ 9-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 Yellowstone for the same years, and z = 9-Yr average yield or test weight for the check variety Yellowstone.

6/ 2002 Nursery abandoned due to extreme drought stress at this location.

7/ May to 14 days prior to harvest maturity.

TABLE 4. Nine-Year Sawfly Summary of Selected Entries from Dryland Fallow Winter Wheat Variety Nurseries Grown Off-Station at McKeever Farms, Loma. Northern Agricultural Research Center. Havre, Montana. 2003-2011. (Exp# 3853-WW)

2/ VARIETY or SELECTION		No. of YEARS TESTED	1/ SAWFLY RATING (% of cut and lodged stems) 2003	2004	2005	2006	2007	2008	2009	2010	2011	AVE. for YEARS TESTED	% of CHECK SWFLY 3/	**9-YR COMP. AVE. SWFLY 4/**
PI593889	RAMPART (sawfly res)	9	17.9	0.0	0.0	0.0	0.0	3.7	16.7	10.0	10.0	6.5	100.0	**6.5**
PI517194	TIBER	6	17.2	0.0	0.0	1.7	5.0	11.7				5.9	164.8	**10.7**
BZ96-919	PRYOR (P+)	9	18.4	0.0	1.7	0.3	0.3	1.0	28.3	70.0	6.7	14.1	217.6	**14.1**
CI 17879	ROCKY (P)	7	16.1	0.0	1.7	0.7	2.3	5.3	66.3			13.2	241.7	**15.6**
MTW9441	NUSKY (HW)	7	18.1	1.7	0.0	0.3	1.0	3.7	71.7			13.8	252.2	**16.3**
MTS0031	GENOU (sawfly res)(++)	9	18.5	0.0	0.0	0.0	2.0	3.7	50.0	51.7	21.7	16.4	253.3	**16.4**
MTS0713	JUDEE (sawfly res)(++)	3							31.7	53.3	10.0	31.7	259.1	**16.8**
S94-4	CDC FALCON (P+)	9	17.9	0.0	0.0	0.3	0.7	1.0	63.3	99.7	15.0	22.0	339.8	**22.0**
MTCL0318	BYNUM (sf res)(P, CL++)	7			0.0	2.3	2.3	8.3	56.3	63.3	13.3	20.9	361.9	**23.4**
MT0552	DECADE (++)	4						2.3	40.0	96.3	13.3	38.0	376.8	**24.4**
MT00159	YELLOWSTONE (++)	9	16.9	0.0	0.0	0.7	2.3	10.0	85.0	99.3	21.7	26.2	405.0	**26.2**
ND9257	JERRY	9	17.5	1.7	1.7	0.7	6.7	8.3	76.3	96.7	30.0	26.6	411.3	**26.6**
BZ96-788	LEDGER (P+)	6				0.0	3.7	4.0	38.3	100.0	26.7	28.8	428.0	**27.7**
BZ022060	CARTER	3						3.7	38.3	96.0		46.0	454.9	**29.4**
CI 17860	NEELEY	8	18.3	0.0	1.7	2.3	7.0	10.3	86.3	96.3		27.8	460.8	**29.8**
DH001819	ACCIPITER	3							60.0	97.7	28.3	62.0	507.2	**32.8**
PI555458	PROMONTORY	8	17.1	3.3	3.3	3.7	11.7	15.0	94.7	100.0		31.1	515.7	**33.4**
JAGALENE	JAGALENE (P+)	8		1.7	5.0	2.3	5.3	2.3	71.3	99.7	28.3	27.0	535.4	**34.6**
PI619098	WAHOO (++)	8		0.0	3.3	0.7	5.3	10.0	76.7	98.3	38.3	29.1	576.7	**37.3**
MTCL0316	NORRIS (P, CL++)	7			1.7	0.3	11.7	18.3	91.7	93.0	45.0	37.4	648.6	**42.0**
MTCL0306	HYALITE (P, CL++)	6			1.7	2.0	3.7	8.7	84.7	100.0		33.4	661.4	**42.8**
MEANS (For Entries Listed)			17.6	0.6	1.4	1.1	4.2	6.9	61.4	84.5	22.0			**25.2**
5/ Growing Season Precipitation (in.)			4.0	7.4	n/a	8.6	6.9	8.9	n/a	n/a	9.4	7.5		
Soil PAW (in.) to SD @ Planting			8.0	5.7	4.0	7.6	n/a	10.5	7.5	10.1	9.6	7.9		
Total Plant Available Water (in.)			12.0	13.1	4.0	16.2	n/a	19.4	7.5	10.1	19.4	12.7		
Soil NO3 (lbs.) to SD at Planting			170	286	514	192	n/a	300	36	82	26	201		
Fertilizer Applied	(# N)		70	70	70	70	70	70	70	70	70	70		
	(# P_2O_5)		40	40	40	40	40	40	40	40	40	40		
	(# K_2O)		25	25	25	25	25	25	25	25	25	25		

Long-term check variety is Rampart.

1/ See MCES Bulletin 1098 or the Plant Sciences & Plant Pathology website at http://plantsciences.montana.edu/ for evaluation of other important variety performance characteristics to include protein, quality, disease resistance, etc. before making cultivar selecton decisions.

2/ P = Private Variety, + = Protected Variety, ++ = PVP Title 5 or Title 5 Pending, HW = Hard White Wheat, CL = Clearfield Line.

3/ Percent of Rampart cut for the same data years as those in which a given entry was tested.

4/ 9-Yr Comparable Average = (x/y) * z where x = average sawfly rating of a given entry for years tested, y = average sawfly rating for Rampart for the same years, and z = 9-Yr average sawfly rating for the check variety Rampart.

5/ May to 14 days prior to harvest maturity.

TABLE 5. Dryland Fallow Spring Wheat Cultivar Evaluation Nursery Grown Off-Station at the Leon Cederberg Farm, Turner. Northern Agricultural Research Center. Havre, Montana. 2011. (Exp# 11-9951-SW)

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/ YIELD Bu/Ac	MOISTURE %	TEST WT Lbs/Bu	2/ PROTEIN %	3/ SAWFLY %
04S0514-1-12	04S0514-1-12	97.5	23.1	28.6	9.9	61.9	12.9	63.3
AGRIPRO8	AP604CL	98.8	22.5	29.4	10.0	62.1	13.0	38.3
PI633974	CHOTEAU	99.4	21.0	**30.6***	9.9	61.1	13.2	36.7
BZ992588	CONAN	96.6	23.3	**30.5***	10.2	62.6	13.3	23.3
BZ996434	CORBIN	96.6	23.9	**32.5***	10.1	61.9	12.9	21.7
MT 0832	DUCLAIR	98.5	22.9	**31.3***	9.9	59.9	13.0	33.3
CI 13596	FORTUNA	97.2	27.7	29.2	9.9	61.7	14.1	28.3
BZ992322	HANK	98.1	22.0	24.2	9.7	60.4	12.8	58.3
IMICHT79	IMICHT79	99.1	21.4	**35.0****	9.9	61.5	13.0	40.0
BZ9M1044	JEDD	96.6	21.4	26.5	9.9	61.4	12.7	43.3
AGRIPRO6	KELBY	98.5	20.1	24.6	9.8	62.6	14.2	30.2
AGRIPRO7	KUNTZ	97.2	21.6	24.8	9.9	61.7	12.6	61.7
PI574642	MCNEAL	99.7	24.9	28.0	9.6	60.2	13.1	80.0
NDSW0449	MOTT	99.4	23.6	**31.9***	9.9	61.7	13.2	5.0
BZ999592	ONEAL	99.1	24.3	**30.1***	9.9	61.9	12.7	40.0
PI632252	OUTLOOK	99.7	22.0	**30.3***	9.8	60.8	12.4	46.7
ND 695	REEDER	96.6	22.3	27.3	9.7	61.4	12.7	53.3
AGRIPR12	SY TYRA	98.5	20.1	25.6	10.1	62.7	12.1	46.7
PI642366	VIDA	97.8	22.7	**34.7***	10.2	61.7	12.0	26.7
ACS52610	VOLT	97.5	22.5	26.3	10.0	62.2	12.5	93.3
BZ902413	WB GUNNISON	96.6	22.6	**33.0***	10.4	62.3	12.4	6.7
EXPERIMENTAL MEANS		98.0	22.7	29.3	9.9	61.6	12.9	41.8
LSD (0.05)		ns	2.8	5.0	0.2	0.7	-	18.0
C.V.%		1.8	7.5	10.4	1.2	0.7	-	26.2
P-VALUE (Varieties)		0.3581	0.0016	0.0006	<0.0001	<0.0001	-	<0.0001

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.

3/ Sawfly rating is reported as the percentage of cut stems.

** = indicates highest value within a column.

* = indicates varieties with values equal to highest variety within a column based on Fisher's protected LSD (p=0.05).

Site Resource & Management Data: (Exp# 11-9951-SW)							
Field			SaltHaz(MMHOS/cm) 6-24	0.55		Dry Surf Soil (in.) @ Plnt'g	0.25
Quarter	SE		S (ppm) 0-24	16		2" Soil Temp (°F) @ Plnt'g	64
Section	13		Zn (ppm) 0-6	0.53		4" Soil Temp (°F) @ Plnt'g	60
Tow nship	36N		Fe (ppm) 0-6	46.50		Fertilizer Formulation	Gran Blend
Range	25E		Mn (ppm) 0-6	14.97		Fertilizer Placement	Bnd at Plntg
Latitude	N48 52.579'		Cu (ppm) 0-6	0.83		Fert. Rate (lbs/ac) N	70
Longitude	W109 23.530'		CEC 0-6	9.80		Fert. Rate (lbs/ac) P2O5	40
Soil Series	Telstad Loam		Soil Texture 0-6	n/a		Fert. Rate (lbs/ac) K2O	25
pH 0-6	5.7		Soil Texture 6-24	n/a		Herbicide App. Date	none
Org.Matter (%) 0-6	1.3		Soil Texture 24-36	n/a		Herbicide Product	n/a
N (lbs/ac) 0-6	7		Soil Texture 36-48	n/a		Herbicide Rate (/ac)	n/a
N (lbs/ac) 6-24	30		Init PAW (in.) 0-6"	0.79		Precip (in.) Plnt'g-Harvest	8.29
N (lbs/ac) 24-36	14		Init PAW (in.) 6-24"	3.19		Precip (>.1) Plnt'g-Harvest	7.74
N (lbs/ac) 36-48	16		Init PAW (in.) 24-36"	1.99		Harvest Date	8/26
N (lbs/ac) 0-48	51		Init PAW (in.) 36-48"	1.94		Rooting Depth (in.)	32"+
P (ppm) Olsen 0-6	26		Init PAW (in.) 0-48"	7.91		Post PAW (in.) 0-6"	0.82
K (ppm) 0-6	209		Cropping System	NT-MechFlw		Post PAW (in.) 6-24"	1.88
Ca (ppm)	1270		Previous Crop	Durum		Post PAW (in.) 24-36"	0.35
Mg (ppm) 0-6	337		Planting Date	5/12		Post PAW (in.) 36-48"	-
Na (MEQ/100g) 0-6	14		Planting Depth (in.)	1.5		Post PAW (in.) 0-48"	3.06
SaltHaz (MMHOS/cm) 0-6	0.14		Moist Soil Depth @ Plnt'g	48+		Precip (>.1) Hvst-Post	0

TABLE 6. 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. 2002-2011. (Exp# 9951-SW)

2/ VARIETY or SELECTION		No. of YEARS TESTED 3/	1/ YIELD (Bushels Per Acre) 2007	2008	2009	2010	2011	AVE. for YEARS TESTED 3/	% of CHECK YIELD 4/	**10-YR COMP. AVE. YIELD 5/**	TEST WEIGHT (Pounds Per Bushel) 2007	2008	2009	2010	2011	AVE. for YEARS TESTED 3/	% of CHECK TEST WT 4/	**10-YR COMP. AVE. TEST WT 5/**
BZ999592	ONEAL (P+)	4		20.5	47.8	37.1	30.1	33.9	126.7	**36.8**		57.9	61.6	57.8	61.9	59.8	101.7	**59.7**
PI642366	VIDA (++)	8	23.9	20.2	50.7	25.6	34.7	36.8	122.9	**35.7**	53.9	55.8	60.8	55.6	61.7	58.2	99.0	**58.1**
BZ9M1044	JEDD (P+)	4		20.8	40.6	41.5	26.5	32.4	121.1	**35.2**		58.2	62.1	57.0	61.4	59.7	101.4	**59.6**
PI633974	CHOTEAU (+)(saw fly res)	10	24.0	20.3	38.2	32.6	30.6	33.6	115.5	**33.6**	54.3	54.5	60.1	53.7	61.1	57.5	97.9	**57.5**
PI574642	McNEAL	10	23.6	19.4	41.4	32.7	28.0	33.5	115.3	**33.5**	53.0	55.7	60.6	55.2	60.2	57.9	98.6	**57.9**
BZ996434	CORBIN	5	25.0	19.7	38.2	32.7	32.5	29.6	113.4	**33.0**	55.0	56.6	61.4	55.6	61.9	58.1	99.9	**58.7**
ND695	REEDER (+)	10	22.4	18.1	45.1	30.9	27.3	32.8	112.8	**32.8**	54.6	56.7	61.3	56.5	61.4	58.7	100.0	**58.7**
BZ992322	HANK (P+)	10	25.1	18.4	49.3	36.5	24.2	32.7	112.4	**32.7**	54.1	56.6	60.7	54.7	60.4	57.9	98.5	**57.9**
BZ992588	CONAN (P+)(saw fly tol)	10	24.4	18.9	39.1	31.4	30.5	32.3	111.2	**32.3**	56.2	57.3	61.2	56.8	62.6	59.4	101.2	**59.4**
PI592761	ERNEST (+)(saw fly res)	6	22.4					33.9	110.7	**32.2**	54.5					58.0	98.9	**58.1**
PI632252	OUTLOOK (++)(RWA res)	10	24.3	18.8	38.6	26.9	30.3	31.8	109.3	**31.8**	53.3	55.6	59.9	54.5	60.8	57.7	98.2	**57.7**
PI619086	EXPLORER (HW, ++)	7	21.4	21.2				31.1	108.2	**31.5**	54.9	56.8				57.9	99.4	**58.4**
PI607557	SCHOLAR (P+)(mod sf res)	6	20.7					33.0	107.9	**31.4**	54.1					58.5	99.7	**58.5**
AGRIPRO7	KUNTZ (P+)	4		17.5	40.0	32.4	24.8	28.7	107.3	**31.2**		56.7	61.2	56.3	61.7	59.0	100.2	**58.8**
AGRIPRO3	FREYR (P+)	5	20.3	19.4	39.8	31.6		26.1	106.6	**31.0**	54.7	56.6	61.3	56.5		57.3	99.8	**58.6**
ACS53610	VOLT (P+)	4		16.2	42.5	27.2	26.3	28.0	104.9	**30.5**		56.7	62.2	56.8	62.2	59.5	101.1	**59.3**
AGRIPRO6	KELBY (P+)	4		19.1	33.3	32.9	24.6	27.5	102.8	**29.9**		57.0	61.4	56.8	62.6	59.4	101.0	**59.3**
CI13596	FORTUNA (saw fly res)	10	23.7	17.5	35.8	24.4	29.2	29.1	100.0	**29.1**	55.3	56.3	61.0	56.4	61.7	58.7	100.0	**58.7**
AGRIPRO1	NORPRO (P+)	4	17.3	17.2				24.6	97.7	**28.4**	52.0	55.6				55.3	96.2	**56.5**
MEANS (For Entries Listed)			22.8	19.0	41.4	31.8	28.5			**32.2**	54.3	56.5	61.1	56.0	61.5			**58.5**
6/ Growing Season Precipitation (in.)			7.0	6.6	6.0	10.3	8.3	7.4										
Soil PAW (in.) to SD @ Planting			5.8	8.1	7.8	9.0	7.9	7.5										
Total Plant Available Water (in.)			9.6	14.6	13.8	19.2	7.9	13.1										
Soil NO3 (lbs.) to SD at Planting			81	n/a	94	162	51	99										
SD (Sampling Depth in Inches)			48	48	48	48	48	48										
Fertilizer Applied	(# N)		70	70	70	70	70	70										
	(# P_2O_5)		40	40	40	40	40	40										
	(# K_2O)		25	25	25	25	25	25										

Check Variety is Fortuna.

1/ See MCES Bulletin 1093 or the Plant Sciences & Plant Pathology website at http://plantsciences.montana.edu/ for evaluation of other important variety performance characteristics to include protein, quality, disease resistance, etc. before making cultivar selecton decisions.

2/ P = Private Variety, + = Protected Variety, ++ = PVP Title 5 or Title 5 Pending, HW = Hard White Wheat.

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/ 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.

6/ Seeding to 14 days prior to harvest maturity.

TABLE 7. Nine-Year Sawfly 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. 2003-2011. (Exp# 9951-SW)

2/ VARIETY or SELECTION		No. of YEARS TESTED	1/ SAWFLY RATING (% of cut and lodged stems) 2003	2004	2005	2006	2007	2008	2009	2010	2011	AVE. for YEARS TESTED	% of CHECK SAWFLY 3/	**9-YR COMP. AVE. SAWFLY 4/**
BZ996434	CORBIN	5					5.0	11.7	3.7	10.3	21.7	10.5	83.5	**9.9**
BZ992588	CONAN (P+)(saw fly tol)	9	2.3	15.0	5.0	26.7	11.7	10.0	3.7	3.7	23.3	11.3	95.3	**11.3**
CI 13596	FORTUNA (saw fly res)	9	3.7	11.7	5.0	23.3	16.7	8.3	1.0	8.3	28.3	11.8	100.0	**11.8**
PI633974	CHOTEAU (+)(saw fly res)	9	3.7	15.0	5.0	21.7	6.7	13.3	3.7	13.3	36.7	13.2	111.9	**13.2**
PI592761	ERNEST (+)(saw fly res)	5	6.7	20.0	5.0	21.7	23.3					15.3	127.1	**15.0**
AGRIPRO6	KELBY (P+)	4						21.7	7.0	8.7	30.2	16.9	146.8	**17.3**
BZ999592	ONEAL (P+)	4						21.7	7.0	2.3	40.0	17.8	154.4	**18.2**
BZ9M1044	JEDD (P+)	4						23.3	3.7	3.7	43.3	18.5	160.9	**19.0**
PI642366	VIDA (++)	8		18.3	0.0	53.3	38.3	20.0	2.3	18.3	26.7	22.2	172.7	**20.4**
AGRIPRO1	NORPRO (P+)	4			11.7	71.7	21.7	23.3				32.1	240.6	**28.4**
ND 695	REEDER (+)	9	15.0	28.3	5.0	81.7	35.0	18.3	6.7	16.7	53.3	28.9	244.5	**28.9**
BZ992322	HANK (P+)	9	20.0	36.7	6.7	78.3	38.3	20.0	5.7	8.3	58.3	30.3	256.1	**30.3**
PI632252	OUTLOOK (++)(RWA res)	9	6.7	31.7	8.3	81.7	41.7	30.0	13.3	21.7	46.7	31.3	264.9	**31.3**
PI607557	SCHOLAR (P+)(mod sf res	5	15.0	36.7	10.0	60.0	41.7					32.7	270.7	**32.0**
AGRIPRO7	KUNTZ (P+)	4						35.0	13.3	18.3	61.7	32.1	279.0	**33.0**
PI619086	EXPLORER (HW, ++)	6	11.7	40.0	11.7	68.3	51.7	33.3				36.1	315.5	**37.3**
PI574642	McNEAL	9	15.0	43.3	16.7	73.3	56.7	46.7	18.3	25.0	80.0	41.7	352.7	**41.7**
AGRIPRO3	FREYR (P+)	6			8.3	90.0	41.7	31.7	18.3	31.7		36.9	353.8	**41.8**
ACS53610	VOLT (P+)	4						70.0	25.0	38.3	93.3	56.7	492.8	**58.2**
MEANS (For Entries Listed)			10.0	27.0	7.6	57.8	30.7	25.8	8.8	15.2	46.0			**26.3**
5/ Growing Season Precipitation (in.)			3.1	13.7	9.7	2.5	7.0	6.6	6.0	10.3	8.3	7.4		
Soil PAW (in.) to SD @ Planting			7.0	7.4	8.0	8.8	5.8	8.1	7.8	9.0	7.9	7.8		
Total Plant Available Water (in.)			10.1	21.1	17.7	11.3	9.6	14.6	13.8	19.2	7.9	13.9		
Soil NO3 (lbs.) to SD at Planting			160	160	84	64	81	n/a	94	162	51	107		
SD (Sampling Depth in Inches)			48	48	48	48	48	48	48	48	48	48		
Fertilizer Applied	(# N)		70	70	70	70	70	70	70	70	70	70		
	(# P_2O_5)		40	40	40	40	40	40	40	40	40	40		
	(# K_2O)		25	25	25	25	25	25	25	25	25	25		

Long-term check variety is Fortuna.

1/ See MCES Bulletin 1093 or the Plant Sciences & Plant Pathology website at http://plantsciences.montana.edu/ for evaluation of other important variety performance characteristics to include protein, quality, disease resistance, etc. before making cultivar selecton decisions.

2/ P = Private Variety, + = Protected Variety, ++ = PVP Title 5 or Title 5 Pending, HW = Hard White Wheat.

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

4/ 9-Yr Comparable Average = (x/y) * z where x = average sawfly rating of a given entry for years tested, y = average sawfly rating for Fortuna for the same years, and z = 9-Yr average sawfly rating for the check variety Fortuna.

5/ Seeding to 14 days prior to harvest maturity.

TABLE 8. Dryland Fallow Spring Wheat Cultivar Evaluation Nursery Grown Off-Station at the Flansaas-Lumsden Farm, Loring. Northern Agricultural Research Center. Havre, Montana. 2011. (Exp# 11-9955-SW)

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/ YIELD Bu/Ac	MOISTURE %	TEST WT Lbs/Bu	2/ PROTEIN %	3/ SAWFLY %
04S0514-1-12	04S0514-1-12	100.0	22.5	**37.8***	9.4	61.9	13.0	18.3
AGRIPRO8	AP604CL	100.0	22.5	31.9	9.2	62.1	13.9	15.0
PI633974	CHOTEAU	100.0	22.0	34.2	9.0	60.5	13.9	16.7
BZ992588	CONAN	100.0	24.0	32.4	9.2	61.6	14.0	13.3
BZ996434	CORBIN	100.0	23.2	**36.6***	9.3	61.5	13.5	10.0
MT 0832	DUCLAIR	100.0	23.3	33.5	9.0	59.3	13.4	15.0
CI 13596	FORTUNA	100.0	27.0	34.2	9.3	61.0	14.0	6.7
BZ992322	HANK	100.0	22.9	32.9	9.2	60.6	13.7	11.7
IMICHT79	IMICHT79	100.0	21.7	**38.9***	9.1	60.8	13.4	13.3
BZ9M1044	JEDD	99.1	23.1	32.5	9.5	62.8	12.9	10.0
AGRIPRO6	KELBY	99.4	24.3	33.3	9.2	62.7	14.3	15.0
AGRIPRO7	KUNTZ	100.0	23.3	32.9	9.3	61.9	12.8	20.0
PI574642	MCNEAL	100.0	23.6	33.2	9.1	60.3	13.8	20.0
NDSW0449	MOTT	100.0	23.8	**37.4***	9.2	61.1	13.7	5.0
BZ999592	ONEAL	100.0	24.8	**40.5****	9.5	62.2	12.7	16.7
PI632252	OUTLOOK	100.0	23.6	**37.0***	9.1	60.6	12.9	15.0
ND 695	REEDER	99.4	22.4	34.9	9.1	61.7	13.5	18.3
AGRIPR12	SY TYRA	98.5	22.6	34.0	9.4	62.5	12.5	15.0
PI642366	VIDA	99.7	23.3	**38.0***	9.3	61.2	12.9	18.3
ACS52610	VOLT	100.0	23.6	34.6	9.4	62.5	13.4	23.3
BZ902413	WB GUNNISON	100.0	23.0	34.8	9.5	61.8	13.1	5.0
EXPERIMENTAL MEANS		99.8	23.4	35.0	9.2	61.5	13.4	14.4
LSD (0.05)		ns	1.8	3.9	0.2	0.6	-	9.8
C.V.%		0.6	4.6	6.7	1.0	0.6	-	41.2
P-VALUE (Varieties)		0.1409	0.0006	0.0010	<0.0001	<0.0001	-	0.0243

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.

3/ Sawfly rating is reported as the percentage of cut stems.

** = indicates highest value within a column.

* = indicates varieties with values equal to highest variety within a column based on Fisher's protected LSD (p=0.05).

Site Resource & Management Data: (Exp# 11-9955-SW)							
Field			SaltHaz(MMHOS/cm) 6-24	0.42		Dry Surf Soil (in.) @ Plnt'g	0.25
Quarter	SW		S (ppm) 0-24	18		2" Soil Temp (°F) @ Plnt'g	61
Section	24		Zn (ppm) 0-6	0.76		4" Soil Temp (°F) @ Plnt'g	58
Township	35N		Fe (ppm) 0-6	42.70		Fertilizer Formulation	Gran.Blend
Range	29E		Mn (ppm) 0-6	12.02		Fertilizer Placement	Bnd at Plntg
Latitude	N48 46.523'		Cu (ppm) 0-6	0.68		Fert. Rate (lbs/ac) N	70
Longitude	W107 52.563'		CEC 0-6	13		Fert. Rate (lbs/ac) P2O5	40
Soil Series	Scobey Cl		Soil Texture 0-6	n/a		Fert. Rate (lbs/ac) K2O	25
pH 0-6	6.2		Soil Texture 6-24	n/a		Herbicide App. Date	6/15/2011
Org.Matter (%) 0-6	1.8		Soil Texture 24-36	n/a		Herbicide Product	Axial & Broxm
N (lbs/ac) 0-6	8		Soil Texture 36-48	n/a		Herbicide Rate (/ac)	16.4 & 16 oz/ac
N (lbs/ac) 6-24	30		Init PAW (in.) 0-6"	0.91		Precip (in.) Plnt'g-Harvest	n/a
N (lbs/ac) 24-36	12		Init PAW (in.) 6-24"	2.24		Precip (>.1) Plnt'g-Harvest	n/a
N (lbs/ac) 36-48			Init PAW (in.) 24-36"	2.07		Harvest Date	8/25
N (lbs/ac) 0-48	50		Init PAW (in.) 36-48"	1.85		Rooting Depth (in.)	28"+
P (ppm) Olsen 0-6	22		Init PAW (in.) 0-48"	7.06		Post PAW (in.) 0-6"	0.43
K (ppm) 0-6	299		Cropping System	NT-ChmFlw		Post PAW (in.) 6-24"	1.23
Ca (ppm)	1581		Previous Crop	barley		Post PAW (in.) 24-36"	0.97
Mg (ppm) 0-6	511		Planting Date	5/6		Post PAW (in.) 36-48"	
Na (ppm) 0-6	20		Planting Depth (in.)	1.5		Post PAW (in.) 0-48"	2.63
SaltHaz (MMHOS/cm) 0-6	0.19		Moist Soil Depth @ Plnt'g	48+		Precip (>.1) Hvst-Post	0

TABLE 9. Ten-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. 2002-2011. (Exp# 9955-SW)

2/ VARIETY or SELECTION		No. of YEARS TESTED 3/	1/ YIELD (Bushels Per Acre) 2007	2008	2009	2010	2011	AVE. for YEARS TESTED 3/	% of CHECK YIELD 4/	**10-YR COMP. AVE. YIELD 5/**	TEST WEIGHT (Pounds Per Bushel) 2007	2008	2009	2010	2011	AVE. for YEARS TESTED 3/	% of CHECK TEST WT 4/	**10-YR COMP. AVE. TEST WT 5/**
PI642366	VIDA (++)	8	36.3	33.6	33.3	37.0	38.0	38.1	127.0	**38.3**	55.7	57.6	60.5	56.5	61.2	58.5	100.2	**58.2**
BZ999592	ONEAL (P+)	4		38.6	31.4	36.3	40.5	36.7	126.5	**38.2**		59.4	62.6	58.2	62.2	60.6	103.7	**60.3**
BZ9M1044	JEDD (P+)	4		39.5	31.2	36.2	32.5	34.9	120.3	**36.3**		59.6	62.4	57.8	62.8	60.7	103.8	**60.3**
BZ996434	CORBIN	5	31.8	34.7	30.0	30.5	36.6	32.7	114.8	**34.6**	54.8	58.1	61.4	55.8	61.5	58.3	100.6	**58.4**
ND 695	REEDER (+)	10	32.4	36.9	30.4	32.9	34.9	33.9	112.2	**33.9**	55.1	58.0	61.5	56.7	61.7	58.4	100.4	**58.4**
AGRIPRO1	NORPRO (P+)	4	29.0	33.7				30.2	111.5	**33.6**	53.4	57.9				55.7	97.5	**56.7**
PI632252	OUTLOOK (++)(RWA res)	10	33.3	31.7	32.7	28.6	37.0	33.3	110.5	**33.3**	53.2	57.2	59.5	55.3	60.6	57.0	98.1	**57.0**
AGRIPRO7	KUNTZ (P+)	4		34.5	30.4	30.1	32.9	32.0	110.3	**33.3**		58.0	61.4	56.5	61.9	59.5	101.8	**59.1**
AGRIPRO6	KELBY (P+)	4		34.1	24.0	35.1	33.3	31.6	109.1	**32.9**		58.5	61.2	57.0	62.7	59.8	102.4	**59.5**
ACS53610	VOLT (P+)	4		30.0	27.0	34.7	34.6	31.5	108.8	**32.8**		58.2	62.1	57.8	62.5	60.1	103.0	**59.8**
PI633974	CHOTEAU (+)(saw fly res)	10	29.5	34.9	26.1	29.6	34.2	32.8	108.6	**32.8**	54.4	56.2	59.2	54.5	60.5	57.0	98.1	**57.0**
BZ992322	HANK (P+)	10	32.2	35.8	31.5	30.2	32.9	32.6	107.9	**32.6**	52.9	57.3	61.0	55.1	60.6	57.0	98.1	**57.0**
PI574642	McNEAL	10	30.6	34.9	27.8	29.3	33.2	32.1	106.5	**32.1**	53.5	57.5	60.4	55.7	60.3	57.0	98.1	**57.0**
AGRIPRO3	FREYR (P+)	5	30.2	32.4	28.4	26.1		27.5	106.3	**32.1**	54.6	58.2	62.0	56.3		57.8	101.0	**58.7**
BZ992588	CONAN (P+)(saw fly tol)	10	29.9	30.9	25.3	32.8	32.4	31.5	104.5	**31.5**	55.6	58.4	61.6	57.4	61.6	59.0	101.5	**59.0**
PI619086	EXPLORER (HW, ++)	7	30.5	30.4				32.0	104.3	**31.5**	54.9	57.8				57.3	99.1	**57.6**
PI592761	ERNEST (+)(saw fly res)	6	27.2					32.2	104.2	**31.4**	55.4					57.3	98.9	**57.5**
PI607557	SCHOLAR (+)(mod sf res)	6	32.8					31.9	103.1	**31.1**	56.6					58.3	100.7	**58.5**
CI 13596	FORTUNA (saw fly res)	10	26.5	29.1	26.2	26.4	34.2	30.2	100.0	**30.2**	56.4	57.7	58.5	56.4	61.0	58.1	100.0	**58.1**
MEANS (For Entries Listed)			30.8	33.9	29.0	31.7	34.8			**33.1**	54.7	58.0	61.0	56.5	61.5			**58.2**
6/ Growing Season Precipitation (in.)			7.4	8.9	5.3	11.6	n/a	7.4										
Soil PAW (in.) to SD @ Planting			8.3	8.2	10.5	7.7	7.1	8.0										
Total Plant Available Water (in.)			15.7	17.2	15.7	19.3	n/a	14.6										
Soil NO3 (lbs.) to SD at Planting			89	n/a	42	94	50	70										
SD (Sampling Depth in Inches)			48	48	48	48	48	48										
Fertilizer Applied	(# N)		70	70	70	70	70	70										
	(# P_2O_5)		40	40	40	40	40	40										
	(# K_2O)		25	25	25	25	25	25										

Check Variety is Fortuna.

1/ See MCES Bulletin 1093 or the Plant Sciences & Plant Pathology website at http://plantsciences.montana.edu/ for evaluation of other important variety performance characteristics to include protein, quality, disease resistance, etc. before making cultivar selecton decisions.

2/ P = Private Variety, + = Protected Variety, ++ = PVP Title 5 or Title 5 Pending, HW = Hard White Wheat.

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/ 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.

6/ Seeding to 14 days prior to harvest maturity.

TABLE 10. Nine-Year Sawfly 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. 2003-2011. (Exp# 9955-SW)

2/ VARIETY or SELECTION		No. of YEARS TESTED	1/ SAWFLY RATING (% Cut and Lodged) 2003	2004	2005	2006	2007	2008	2009	2010	2011	AVE. for YEARS TESTED	% of CHECK SAWFLY 3/	**9-YR COMP. AVE. SAWFLY 4/**
BZ9M1044	JEDD (P+)	3						1.0	2.3	2.3	10.0	3.9	56.6	**6.5**
BZ996434	CORBIN	4					2.3	2.3	2.3	5.3	10.0	4.5	71.2	**8.1**
BZ999592	ONEAL (P+)	3						1.0	3.7	2.3	16.7	5.9	85.5	**9.8**
AGRIPRO6	KELBY (P+)	3						5.3	2.3	3.7	15.0	6.6	95.1	**10.9**
CI 13596	FORTUNA (sawfly res)	8	13.3	20.0	30.0	8.3	3.7	4.0	5.3	11.7	6.7	11.4	100.0	**11.4**
PI633974	CHOTEAU (+)(sawfly res)	8	10.0	28.3	26.7	5.0	2.3	2.3	3.7	8.3	16.7	11.5	100.4	**11.5**
BZ992588	CONAN (P+)(sawfly tol)	8	30.0	16.7	35.0	13.3	1.0	2.3	1.0	1.0	13.3	12.6	110.4	**12.6**
PI642366	VIDA (++)	7		20.0	33.3	23.3	3.7	6.7	8.3	10.0	18.3	15.5	137.9	**15.8**
AGRIPRO7	KUNTZ (P+)	3						5.3	5.0	10.0	20.0	10.1	145.7	**16.7**
PI592761	ERNEST (+)(sawfly res)	5	16.7	45.0	40.0	15.0	11.7					25.7	170.3	**19.5**
AGRIPRO1	NORPRO (P+)	4			20.0	48.3	6.7	3.7				19.7	171.0	**19.6**
ND 695	REEDER (+)	8	26.7	68.3	33.3	55.0	10.0	3.7	3.7	10.3	18.3	25.5	222.7	**25.5**
BZ992322	HANK (P+)	8	25.0	86.7	31.7	63.3	20.0	2.3	6.7	5.0	11.7	28.0	245.1	**28.0**
PI632252	OUTLOOK (++)(RWA res)	8	35.0	66.7	38.3	68.3	10.0	8.3	8.3	13.3	15.0	29.3	255.7	**29.3**
PI619086	EXPLORER (HW, ++)	6	28.3	93.3	33.3	53.3	11.7	8.3				38.1	287.8	**32.9**
PI607557	SCHOLAR (+)(mod sf res)	5	33.3	78.3	40.0	63.3	6.7					44.3	294.2	**33.7**
ACS53610	VOLT (P+)	3						23.3	26.7	15.0	23.3	22.1	319.1	**36.5**
AGRIPRO3	FREYR (P+)	5				71.7	13.3	6.7	6.7	11.7		22.0	333.4	**38.1**
PI574642	McNEAL	8	60.0	63.3	88.3	71.7	16.7	6.7	21.7	20.0	20.0	40.9	357.8	**40.9**
MEANS (For Entries Listed)			27.8	53.3	37.5	43.1	8.5	5.5	7.2	8.7	15.4			**21.4**
5/ Growing Season Precipitation (in.)			5.6	10.9	n/a	2.4	7.4	8.9	5.3	11.6	n/a	7.4		
Soil PAW (in.) to SD @ Planting			8.3	4.9	9.1	8.3	8.3	8.2	10.5	7.7	7.1	8.0		
Total Plant Available Water (in.)			13.8	15.8	9.1	10.7	15.7	17.2	15.7	19.3	n/a	14.6		
Soil NO3 (lbs.) to SD at Planting			76	60	54	81	89	n/a	42	94	50	68		
SD (Sampling Depth in Inches)			48	48	48	48	48	48	48	48	48	48		
Fertilizer Applied	(# N)		70	70	70	70	70	70	70	70	70	70		
	(# P_2O_5)		40	40	40	40	40	40	40	40	40	40		
	(# K_2O)		25	25	25	25	25	25	25	25	25	25		

Long-term check variety is Fortuna.

1/ See MCES Bulletin 1093 or the Plant Sciences & Plant Pathology website at http://plantsciences.montana.edu/ for evaluation of other important variety performance characteristics to include protein, quality, disease resistance, etc. before making cultivar selecton decisions.

2/ P = Private Variety, + = Protected Variety, ++ = PVP Title 5 or Title 5 Pending, HW = Hard White Wheat.

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

4/ 9-Yr Comparable Average = (x/y) * z where x = average sawfly rating of a given entry for years tested, y = average sawfly rating for Fortuna for the same years, and z = 9-Yr average sawfly rating for the check variety Fortuna.

5/ Seeding to 14 days prior to harvest maturity.

TABLE 11. Dryland Fallow Spring Durum Cultivar Evaluation Nursery Grown Off-Station at the Leon Cederberg Farm, Turner. Northern Agricultural Research Center. Havre, Montana. 2011. (Exp# 11-9851-DUR)

ENTRY	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/ YIELD Bu/Ac	MOISTURE %	TEST WT Lbs/Bu	2/ PROTEIN %	3/ SAWFLY %
1	Alkabo	99.4	23.0	23.9	9.4	62.7	11.4	46.7
7	Alzada	95.4	22.2	24.4	9.3	61.3	13.0	15.0
10	Belfield	98.1	23.2	**26.2***	9.1	61.4	13.2	25.0
6	Divide	99.1	24.4	**25.2***	9.2	61.6	13.0	16.7
4	Grenora	98.8	22.3	**26.6***	9.2	61.3	12.5	38.3
8	Mountrail	100.0	22.7	**26.8***	9.4	61.2	11.7	31.7
12	MT03012	98.5	21.1	**24.8***	9.2	61.0	13.4	18.3
13	MT04174	96.9	21.0	**26.5***	9.3	61.2	12.8	16.7
14	MT04340	98.5	21.6	**28.2****	9.3	60.6	12.9	5.3
15	MT05166	97.2	22.9	**26.0***	9.4	61.5	12.5	5.0
16	MT05183	98.5	22.0	**27.8***	9.3	62.2	11.8	10.0
9	Normanno	69.1	19.8	8.7	9.7	59.8	12.3	1.0
2	Pierce	99.1	23.0	**26.1***	9.4	62.1	12.1	33.3
5	Strongfield	97.2	24.5	**25.5***	9.2	60.9	13.1	10.0
3	Tioga	99.1	24.1	**26.7***	9.5	62.2	11.0	23.3
11	Westhope	96.3	23.0	**25.8***	9.2	61.3	12.9	13.3
EXPERIMENTAL MEANS		96.3	22.6	24.9	9.3	61.4	12.5	19.4
LSD (0.05)		3.9	2.0	3.5	0.2	0.6	-	11.4
C.V.%		2.4	5.2	8.4	1.3	0.6	-	35.2
P-VALUE (Varieties)		<0.0001	0.0	<0.0001	0.0	<0.0001	-	<0.0001

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 durum.
2/ Protein values are adjusted to 12 percent grain moisture.
3/ Sawfly rating is reported as the percentage of cut stems.
** = indicates highest value within a column.
* = indicates varieties with values equal to highest variety within a column based on Fisher's protected LSD (p=0.05).

Site Resource & Management Data: (Exp# 11-9851-DUR)							
Field			SaltHaz (MMHOS/cm) 6-24	0.55		Dry Surf Soil (in.) @ Plnt'g	0.25
Quarter	SE		S (ppm) 0-24	16		2" Soil Temp (°F) @ Plnt'g	64
Section	13		Zn (ppm) 0-6	0.53		4" Soil Temp (°F) @ Plnt'g	60
Township	36N		Fe (ppm) 0-6	46.50		Fertilizer Formulation	Gran Blend
Range	25E		Mn (ppm) 0-6	14.97		Fertilizer Placement	Bnd at Plntg
Latitude	N48 52.579'		Cu (ppm) 0-6	0.83		Fert. Rate (lbs/ac) N	70
Longitude	W109 23.530'		CEC 0-6	9.80		Fert. Rate (lbs/ac) P2O5	40
Soil Series	Telstad Loam		Soil Texture 0-6	n/a		Fert. Rate (lbs/ac) K2O	25
pH 0-6	5.7		Soil Texture 6-24	n/a		Herbicide App. Date	none
Org.Matter (%) 0-6	1.3		Soil Texture 24-36	n/a		Herbicide Product	n/a
N (lbs/ac) 0-6	7		Soil Texture 36-48	n/a		Herbicide Rate (/ac)	n/a
N (lbs/ac) 6-24	30		Init PAW (in.) 0-6"	0.79		Precip (in.) Plnt'g-Harvest	8.29
N (lbs/ac) 24-36	14		Init PAW (in.) 6-24"	3.19		Precip (>.1) Plnt'g-Harvest	7.74
N (lbs/ac) 36-48	16		Init PAW (in.) 24-36"	1.99		Harvest Date	8/25
N (lbs/ac) 0-48	51		Init PAW (in.) 36-48"	1.94		Rooting Depth (in.)	32"
P (ppm) Olsen 0-6	26		Init PAW (in.) 0-48"	7.91		Post PAW (in.) 0-6"	0.76
K (ppm) 0-6	209		Cropping System	NT-MechFlw		Post PAW (in.) 6-24"	1.39
Ca (ppm)	1270		Previous Crop	Durum		Post PAW (in.) 24-36"	0.99
Mg (ppm) 0-6	337		Planting Date	5/12		Post PAW (in.) 36-48"	0.45
Na (MEQ/100g) 0-6	14		Planting Depth (in.)	1.5		Post PAW (in.) 0-48"	3.60
SaltHaz (MMHOS/cm) 0-6	0.14		Moist Soil Depth @ Plnt'g	48+		Precip (>.1) Hvst-Post	0

TABLE 12. Ten-Year Yield and Test Weight Summary on Selected Entries from Dryland Fallow Spring Durum Variety Nurseries Grown Off-Station at the Leon Cederberg Farm, Turner. Northern Agricultural Research Center. Havre, Montana. 2002-2011. (Exp# 9851-SW)

2/ VARIETY or SELECTION		No. of YEARS TESTED 3/	1/ YIELD (Bushels Per Acre) 2007	2008	2009	2010	2011	AVE. for YEARS TESTED 3/	% of CHECK YIELD 4/	**10-YR COMP. AVE. YIELD 5/**	TEST WEIGHT (Pounds Per Bushel) 2007	2008	2009	2010	2011	AVE. for YEARS TESTED 3/	% of CHECK TEST WT 4/	**10-YR COMP. AVE. TEST WT 5/**
STRONGFIELD	STRONGFIELD (+)	6	24.0	19.4	36.5	27.0	25.5	25.6	114.8	**31.9**	56.1	57.5	59.9	56.0	60.9	57.9	99.9	**58.7**
YU894-75	ALZADA (P+)	7	25.2	17.1	29.1	28.1	24.4	27.2	111.2	**30.9**	56.1	57.4	60.6	56.2	61.3	58.3	100.5	**59.0**
MT04174	MT04174	4		15.3	31.9	28.6	26.5	25.6	110.1	**30.6**		57.2	60.1	55.8	61.2	58.6	99.7	**58.6**
GRENORA	GRENORA (+)	6	25.6	15.4	35.4	24.9	26.6	24.5	109.6	**30.5**	55.7	56.5	60.6	55.6	61.3	57.8	99.8	**58.6**
MT03012	MT03012	6	24.3	16.5	33.0	26.2	24.8	24.4	109.2	**30.4**	55.0	56.9	60.1	55.4	61.0	57.6	99.5	**58.5**
NORMANNO	NORMANNO	3			40.9	33.1	8.7	27.5	106.4	**29.6**			59.8	55.8	59.8	58.5	100.7	**59.2**
D901313	MOUNTRAIL (+)	10	22.3	15.3	35.4	15.4	26.8	27.8	100.0	**27.8**	56.1	57.6	60.2	56.0	61.2	58.8	100.0	**58.8**
ALKABO	ALKABO (+)	6	22.5	14.8	31.9	17.3	23.9	21.5	96.0	**26.7**	57.5	57.4	60.8	57.0	62.7	59.0	101.8	**59.8**
PIERCE	PIERCE (+)	8	20.0	14.8	32.9	15.5	26.1	26.4	95.4	**26.5**	57.6	57.0	60.9	56.7	62.1	59.3	101.4	**59.6**
DILSE	DILSE (+)	5		12.8	31.2			29.5	93.9	**26.1**		56.9	60.4			59.2	100.5	**59.0**
DIVIDE	DIVIDE	6	20.0	17.2	29.9	14.6	25.2	20.8	93.0	**25.8**	56.7	57.3	60.0	55.2	61.6	58.0	100.2	**58.9**
MEANS (For Entries Listed)			23.0	15.9	33.5	23.1	23.8			**28.8**	56.3	57.2	60.3	56.0	61.3			**59.0**
6/ Growing Season Precipitation (in.)			7.0	6.6	6.0	10.3	8.3	7.7										
Soil PAW (in.) to SD @ Planting			5.8	8.1	7.8	9.0	7.9	7.7										
Total Plant Available Water (in.)			12.8	14.6	13.8	19.2	16.2	15.4										
Soil NO3 (lbs.) to SD at Planting			81	71	94	162	51	92										
SD (Sampling Depth in Inches)			48	48	48	48	48	48										
Fertilizer Applied		(# N)	70	70	70	70	70	69										
		(# P_2O_5)	40	40	40	40	40	40										
		(# K_2O)	25	25	25	25	25	23										

Check Variety is Mountrail.

1/ See MCES Bulletin 1093 or the Plant Sciences & Plant Pathology website at http://plantsciences.montana.edu/ for evaluation of other important variety performance characteristics to include protein, quality, disease resistance, etc. before making cultivar selecton decisions.

2/ P = Private Variety, + = Protected Variety, ++ = PVP Title 5 or Title 5 Pending.

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

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

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

6/ Seeding to 14 days prior to harvest maturity.

TABLE 13. Nine-Year Sawfly Summary on Selected Entries from Dryland Fallow Spring Durum Variety Nurseries Grown Off-Station at the Leon Cederberg Farm, Turner. Northern Agricultural Research Center. Havre, Montana. 2003-2011. (Exp# 9851-SW)

2/ VARIETY or SELECTION		No. of YEARS TESTED	1/ SAWFLY RATING (% of cut and lodged stems) 2003	2004	2005	2006	2007	2008	2009	2010	2011	AVE. for YEARS TESTED	% of CHECK SWFLY 3/	**9-YR COMP. AVE. SWFLY 4/**
NORMANNO	NORMANNO	3							0.7	2.3	1.0	1.3	6.5	**1.4**
YU894-75	ALZADA (P+)	7			10.0	20.0	6.7	2.3	8.3	8.3	15.0	10.1	43.7	**9.6**
STRONGFLD	STRONGFIELD (+)	6				16.7	10.0	2.3	10.0	13.3	10.0	10.4	45.8	**10.1**
MT03012	MT03012	6				11.7	11.7	2.3	5.7	18.3	18.3	11.3	50.0	**11.0**
DIVIDE	DIVIDE	6				26.7	13.3	3.7	5.0	18.3	16.7	13.9	61.5	**13.6**
MT04174	MT04174	4						3.7	8.7	18.3	16.7	11.8	66.0	**14.6**
PIERCE	PIERCE (+)	8		25.0	20.0	43.3	21.7	8.3	11.7	23.3	33.3	23.3	96.5	**21.3**
D901313	MOUNTRAIL (+)	9	5.0	31.7	16.7	48.3	25.0	10.0	8.3	21.7	31.7	22.0	100.0	**22.0**
DILSE	DILSE (+)	5		30.0	15.0	50.0		8.3	15.0			23.7	102.9	**22.7**
ALKABO	ALKABO (+)	6				48.3	25.0	15.0	8.7	21.7	46.7	27.6	121.6	**26.8**
GRENORA	GRENORA (+)	6				50.0	33.3	11.7	15.0	25.0	38.3	28.9	127.5	**28.1**
MEANS (For Entries Listed)			5.0	28.9	15.4	35.0	18.3	6.8	8.8	17.1	22.8			**16.5**
5/ Growing Season Precipitation (in.)			3.1	13.7	9.7	2.5	7.0	6.6	6.0	10.3	8.3	7.5		
Soil PAW (in.) to SD @ Planting			7.0	7.4	8.0	8.8	5.8	8.1	7.8	9.0	7.9	7.8		
Total Plant Available Water (in.)			10.1	21.1	17.7	11.3	12.8	14.6	13.8	19.2	16.2	15.2		
Soil NO3 (lbs.) to SD at Planting			160	104	84	64	81	71	94	162	51	97		
SD (Sampling Depth in Inches)			48	48	48	48	48	48	48	48	48	48		
Fertilizer Applied	(# N)		70	70	70	70	70	70	70	70	70	70		
	(# P_2O_5)		40	40	40	40	40	40	40	40	40	40		
	(# K_2O)		25	25	25	25	25	25	25	25	25	25		

Long-term check variety is Mountrail.

1/ See MCES Bulletin 1093 or the Plant Sciences & Plant Pathology website at http://plantsciences.montana.edu/ for evaluation of other important variety performance characteristics to include protein, quality, disease resistance, etc. before making cultivar selecton decisions.

2/ P = Private Variety, + = Protected Variety, ++ = PVP Title 5 or Title 5 Pending.

3/ Percent of Mountrail cut for the same data years as those in which a given entry was tested.

4/ 9-Yr Comparable Average = (x/y) * z where x = average sawfly rating of a given entry for years tested, y = average sawfly rating for Mountrail for the same years, and z = 9-Yr average sawfly rating for the check variety Mountrail.

5/ Seeding to 14 days prior to harvest maturity.

TABLE 14. Dryland Fallow Spring Durum Cultivar Evaluation Nursery Grown Off-Station at the Flansaas-Lumsden Farm, Loring. Northern Agricultural Research Center. Havre, Montana. 2011. (Exp# 11-9855-DUR)

ENTRY	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/ YIELD Bu/Ac	MOISTURE %	TEST WT Lbs/Bu	2/ PROTEIN %	3/ SAWFLY %
1	Alkabo	99.7	21.5	**29.7***	9.5	62.5	11.4	23.3
7	Alzada	100.0	21.8	**28.5***	9.2	61.4	11.8	10.0
10	Belfield	100.0	20.8	**27.1***	9.1	61.3	12.7	15.0
6	Divide	99.7	23.7	**27.9***	9.3	61.7	11.6	13.3
4	Grenora	100.0	21.6	**27.6***	9.3	61.3	11.9	20.0
8	Mountrail	100.0	20.4	**28.4***	9.3	60.9	11.7	20.0
12	MT03012	100.0	19.9	**31.0***	9.1	60.1	12.9	15.0
13	MT04174	100.0	22.8	**31.3****	9.2	60.6	12.8	15.0
14	MT04340	100.0	18.5	**29.9***	9.0	60.5	13.1	5.3
15	MT05166	98.5	21.2	**29.8***	9.3	61.9	11.7	7.0
16	MT05183	99.7	20.7	**30.0***	9.3	62.3	12.4	8.3
9	Normanno	55.6	20.1	11.5	9.2	60.3	12.9	0.3
2	Pierce	99.4	24.6	**29.5***	9.3	62.2	11.9	25.0
5	Strongfield	99.4	23.6	**30.6***	9.2	61.5	12.6	8.3
3	Tioga	99.7	25.3	**29.9***	9.4	62.0	12.1	25.0
11	Westhope	99.4	23.2	**29.7***	9.2	61.4	12.4	11.7
EXPERIMENTAL MEANS		96.9	21.9	28.3	9.2	61.4	12.2	13.9
LSD (0.05)		1.1	2.2	4.2	0.2	0.9		7.3
C.V.%		0.7	6.1	9.0	1.3	0.9	-	31.3
P-VALUE (Varieties)		<0.0001	<0.0001	<0.0001	0.0	<0.0001	-	<0.0001

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 durum.
2/ Protein values are adjusted to 12 percent grain moisture.
3/ Sawfly rating is reported as the percentage of cut stems.
** = indicates highest value within a column.
* = indicates varieties with values equal to highest variety within a column based on Fisher's protected LSD (p=0.05).

Site Resource & Management Data: (Exp# 11-9855-DURUM)							
Field			SaltHaz (MMHOS/cm) 6-24	0.42		Dry Surf Soil (in.) @ Plnt'g	0.25
Quarter	SW		S (ppm) 0-24	18		2" Soil Temp (°F) @ Plnt'g	61
Section	24		Zn (ppm) 0-6	0.76		4" Soil Temp (°F) @ Plnt'g	58
Township	35N		Fe (ppm) 0-6	42.70		Fertilizer Formulation	Gran.Blend
Range	29E		Mn (ppm) 0-6	12.02		Fertilizer Placement	Bnd at Plntg
Latitude	N48 46.523		Cu (ppm) 0-6	0.68		Fert. Rate (lbs/ac) N	70
Longitude	W107 52.563		CEC 0-6	13.00		Fert. Rate (lbs/ac) P2O5	40
Soil Series	Scobey Cl		Soil Texture 0-6	n/a		Fert. Rate (lbs/ac) K2O	25
pH 0-6	6.20		Soil Texture 6-24	n/a		Herbicide App. Date	6/15/2011
Org.Matter (%) 0-6	1.80		Soil Texture 24-36	n/a		Herbicide Product	Axial & Brox M
N (lbs/ac) 0-6	8		Soil Texture 36-48	n/a		Herbicide Rate (/ac)	16.4 & 16 oz/ac
N (lbs/ac) 6-24	30		Init PAW (in.) 0-6"	0.91		Precip (in.) Plnt'g-Harvest	n/a
N (lbs/ac) 24-36	12		Init PAW (in.) 6-24"	2.24		Precip (>.1) Plnt'g-Harvest	n/a
N (lbs/ac) 36-48			Init PAW (in.) 24-36"	2.07		Harvest Date	8/25
N (lbs/ac) 0-48	50		Init PAW (in.) 36-48"	1.85		Rooting Depth (in.)	37"
P (ppm) Olsen 0-6	22		Init PAW (in.) 0-48"	7.06		Post PAW (in.) 0-6"	0.58
K (ppm) 0-6	299		Cropping System	NT-ChmFlw		Post PAW (in.) 6-24"	1.86
Ca (ppm)	1581		Previous Crop	Barley		Post PAW (in.) 24-36"	1.30
Mg (ppm) 0-6	511		Planting Date	5/6		Post PAW (in.) 36-48"	
Na (ppm) 0-6	20		Planting Depth (in.)	1.5		Post PAW (in.) 0-48"	3.74
SaltHaz (MMHOS/cm) 0-6	0.19		Moist Soil Depth @ Plnt'g	48+		Precip (>.1) Hvst-Post	0