TITLE: North Central Montana Off-Station Spring Wheat Variety Performance Evaluations (NARC, 4W4144).

PROJECT LEADER: Peggy F. Lamb, Research Scientist, Havre

PROJECT PERSONNEL: Luther E. Talbert, Breeder/Geneticist, Spring Wheat, Bozeman
Susan P. Lanning, Research Associate, Spring Wheat, Bozeman
Marko Manoukian, Phillips County Extension

COOPERATORS: Max Cederberg, Landowner, Turner
Pete Lumsden/John Flansaas, Landowners, Loring

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 29.7 percent of the 2007-2011 statewide totals (43 percent for winter wheat and 19 percent for spring wheat). 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. Growers in north central Montana are provided reliable, unbiased, up-to-date information to make comparisons among improved spring wheat varieties. This report provides producers in north central Montana the information necessary to select varieties best suited for their specific area and growing conditions.

METHODS:

Standard off-station variety performance trials were conducted in 2012 on chemical fallow at two locations in two northern Montana counties.

Dryland Spring Wheat Trials:

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

Both trials consisted of 21 entries and were seeded in replicated, 3-row, 22-foot plots on a 12-inch row spacing utilizing a self-propelled cone seeder with Atom Jet paired row openers. All rows of each plot were trimmed to a harvest length of 16.5 feet with a rotary mower. Plant height was measured and percent sawfly cutting was estimated for each plot immediately prior to harvest. A 'Wintersteiger Classic' plot combine, funded in part by Montana Wheat and Barley Committee, was used to harvest each 3-row plot. Seed was cleaned prior to measuring plot weight, test weight and moisture content. Other variables specific to each individual trial are listed with the current year data tables.

RESULTS:

Cropping environments in 2012 were fair across north central Montana. Both the Turner and Loring locations had higher than normal precipitation early in the spring; however, the rainfall was untimely and not spread across critical growth stages. At Havre, annual growing season precipitation (9/1/11 through 8/31/12) was 9.46 inches, 21 percent lower than the average for all years since 1916. April 1 through July 31 precipitation was 7.33 inches or 108 percent of the 97-year average. Heat units expressed as "Growing Degree Days" (GDD, base 50) from May through July totaled 1092, 85 percent of the average for the last 62 years (1951-2012). The last spring frost and first fall frost of 2012 were both later than the 97–year average resulting in 125 frost-free days. The minimum winter temperature was -22 degrees F on January 18. Overall, the growing season was warmer than normal. Crop outlook was initially very good with adequate fallow-stored soil moisture and generally favorable conditions. Spring seeded crop performance in some areas was poorer than expected due to lack of timely precipitation in June followed by steady winds and higher than normal temperatures. The April through July growing season saw an average daily temperature of 58.4 degrees F, 1.2 degrees above normal. July and August average temperatures were 3.5 percent higher than normal with the high for 2012 recorded on July 10, 24, 25 and August 7 at 98 degrees F. There were 29 days with temperatures 90 degrees F or above, with no days over 100 degrees F.

Following a substantially damaging hailstorm during the first week of June and another minor hail event in August, spring wheat yields at Turner averaged 21 bu/ac. Experimental line 'MT 1053' was the highest yielding entry at 24.4

bu/ac (Table 1). Publically available varieties 'Choteau', 'Corbin', 'Duclair', 'ONeal', 'Outlook', 'Reeder' and 'Vida', along with two experimental lines produced yields statistically equal to that of MT 1053. Sawfly cutting in the small plot situation ranged from minimal to severe with 1 percent cutting in 'Mott' and 77 percent cutting in 'Volt'.

Loring spring wheat yields averaged 26 bu/ac with experimental line MT 1053 producing the highest yield at 32.4 bu/ac (Table 2). Corbin, ONeal, Outlook and Vida produced yields statistically equal to that of MT 1053. Sawfly cutting was slight to moderate at Loring, ranging from 1 to 27 percent.

Stand percent, plant height, yield, moisture, test weight, protein and sawfly cutting data, where appropriate, for the 2012 Cederberg (Turner) and 2012 Flansaas/Lumsden (Loring) dryland spring wheat trials are summarized in Tables 1 and 2, respectively.

FUNDING SUMMARY:

Expenditure information for grant index 4W4144 is to be provided by Montana State University, Office of Sponsored Programs. There is no other grant support for this project.

MWBC FY2013 GRANT SUBMISSION PLANS:

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

This work has been strongly supported by producers near each of the locations, and by the Northern Ag Research Center Advisory Council. With budget and other resources allowing, it is planned to continue off-station cereal variety investigations in the five-county area. The Loring location is entering its eighteenth 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 growing conditions there are quite different. Cooperator and producer support in the Big Flat area have been outstanding through the years with 2012 marking 25 years at the present Turner site.

TABLE 1. Dryland Fallow Spring Wheat Cultivar Evaluation Nursery Grown Off-Station at the Cederberg Farm, Turner. Northern Agricultural Research Center. Havre, MT. 2012. (Exp# 12-9951-SW)

ID	Cultivar or Selection	Stand %	Plant Ht Inches	1/ Yield Bu/Ac	Moisture %	Test Wt Lbs/Bu	2/ Protein %	3/ Sawfly %
APNARC1	05S0168-23	87.3	21.0	18.9	8.6	61.6	14.7	36.7
AGRIPRO8	AP604CL	94.0	20.5	19.9	8.6	61.2	14.5	28.3
PI633974	CHOTEAU	95.0	21.2	**22.5***	8.4	59.0	14.9	28.3
MT 1008	CHOTEAU/MT0515	81.0	20.2	**23.4***	9.0	60.6	13.4	10.0
BZ996434	CORBIN	93.3	21.3	**22.6***	8.8	60.4	14.3	18.3
PI660981	DUCLAIR	95.3	22.2	**24.0***	8.5	58.9	14.4	30.0
CI 13596	FORTUNA	91.0	24.8	18.6	8.8	60.7	15.0	20.0
BZ992322	HANK	91.7	21.4	20.9	8.5	60.2	14.1	28.3
IMICHT79	IMICHT79	91.3	20.6	**23.1***	8.5	59.7	14.6	16.7
BZ9M1044	JEDD	89.0	19.3	18.5	9.0	62.1	13.8	16.7
AGRIPRO6	KELBY	88.7	20.1	15.8	8.6	61.4	15.3	21.7
PI574642	MCNEAL	93.7	22.0	19.6	8.4	59.5	14.6	61.7
NDSW0449	MOTT	81.7	20.6	19.6	8.6	60.3	14.9	1.0
BZ999592	ONEAL	96.3	21.9	**23.4***	8.8	60.8	14.1	35.0
PI632252	OUTLOOK	97.0	21.8	**22.6***	8.3	59.7	14.0	36.7
ND 695	REEDER	92.7	20.3	**22.8***	8.5	60.5	14.6	33.3
AGRIPR12	SY TYRA	92.0	19.7	19.6	8.9	61.6	13.7	23.3
PI642366	VIDA	91.3	21.3	**23.4***	8.8	60.7	13.9	33.3
MT 1053	VIDA/MTHW0202	84.3	19.7	**24.4****	9.1	61.1	12.9	38.3
ACS52610	VOLT	93.0	21.8	16.6	8.6	61.3	14.2	76.7
BZ92413R	WB GUNNISON	86.3	19.4	21.5	9.1	61.0	13.9	2.3
EXPERIMENTAL MEANS		90.8	21.0	21.0	8.7	60.6	14.3	28.4
LSD (0.05)		8.6	1.8	2.1	0.2	0.6	-	12.0
C.V.%		5.7	5.1	6.0	1.3	0.6	-	25.5
P-VALUE (Varieties)		0.0151	<.0001	<.0001	<.0001	<.0001	-	<.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).

Management Information (12-9951-SW)

Seeding Date:	May 4, 2012
Harvest Date:	August 27, 2012
Fertility:	70-40-25 side banded
System:	no till
Herbicide:	none
Insecticide:	none
Previous Crop:	Chemical Fallow - Durum
Precipitation:	not available

TABLE 2. Dryland Fallow Spring Wheat Cultivar Evaluation Nursery Grown Off-Station at the Flansaas-Lumsden Farm, Loring. Northern Agricultural Research Center. Havre, MT. 2012. (Exp# 12-9955-SW)

ID	Cultivar or Selection	Stand %	Plant Ht Inches	1/ Yield Bu/Ac	Moisture %	Test Wt Lbs/Bu	2/ Protein %	3/ Sawfly %
APNARC1	05S0168-23	88.1	20.1	26.4	8.3	59.7	14.9	20.0
AGRIPRO8	AP604CL	91.4	19.8	27.4	8.4	60.6	14.5	18.3
PI633974	CHOTEAU	90.4	19.9	25.1	8.3	59.7	15.1	6.7
MT 1008	CHOTEAU/MT0515	76.1	20.2	27.0	8.3	60.1	14.1	2.3
BZ996434	CORBIN	89.8	21.8	**29.3***	8.5	60.9	14.1	3.7
PI660981	DUCLAIR	86.4	21.5	26.1	8.5	60.3	14.7	6.7
CI 13596	FORTUNA	88.7	23.3	22.7	8.5	59.8	14.8	6.7
BZ992322	HANK	79.5	21.0	25.4	8.4	60.5	14.4	11.7
IMICHT79	IMICHT79	83.5	19.7	27.0	8.3	60.4	14.8	2.3
BZ9M1044	JEDD	84.5	19.0	27.6	8.4	60.5	13.9	11.7
AGRIPRO6	KELBY	85.4	20.0	22.4	8.6	61.0	15.6	15.0
PI574642	MCNEAL	84.1	20.9	22.9	8.3	60.1	14.8	25.0
NDSW0449	MOTT	82.7	21.5	23.3	8.3	60.4	15.2	1.0
BZ999592	ONEAL	83.8	21.4	**28.7***	8.4	60.4	14.3	8.3
PI632252	OUTLOOK	88.8	22.1	**29.1***	8.4	60.0	14.0	16.7
ND 695	REEDER	85.8	22.3	26.6	8.1	60.2	15.1	15.0
AGRIPR12	SY TYRA	86.3	20.2	26.8	8.1	57.9	14.1	11.7
PI642366	VIDA	90.1	21.6	**29.7***	8.4	60.8	14.0	10.0
MT 1053	VIDA/MTHW0202	87.2	21.0	**32.4****	8.4	60.2	13.4	11.7
ACS52610	VOLT	92.1	21.3	21.5	8.5	60.6	14.5	26.7
BZ92413R	WB GUNNISON	68.9	21.4	23.1	8.3	59.4	14.5	1.0
EXPERIMENTAL MEANS		85.4	21.0	26.2	8.4	60.2	14.5	11.0
LSD (0.05)		12.2	1.6	4.2	0.4	1.2	-	5.9
C.V.%		8.7	4.6	9.7	2.6	1.2	-	32.4
P-VALUE (Varieties)		0.0937	0.0004	0.0002	0.5336	0.0711	-	<.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).

Management Information (12-9955-SW)

Seeding Date:	May 4, 2012
Harvest Date:	August 27, 2012
Fertility:	70-40-25 side banded
System:	no till
Herbicide:	Axial, 16.4 oz/ac; Brox-M, 16 oz/ac
Insecticide:	none
Previous Crop:	Chemical Fallow - Spring Wheat
Precipitation:	not available