

Title (4W5736): North Central Montana Off-Station Spring Durum Variety Performance Evaluations

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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 28 percent of the 2010-2014 statewide cereal production totals (44 percent for winter wheat and 24 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 durum 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 2015 on chemical fallow at three locations in three northern Montana counties.

Dryland Spring Durum Trials:

- | | |
|---|------------|
| 1. Cederberg Farm, Blaine County | 13-36N-25E |
| 2. Flansaas/Lumsden Farm, Phillips County | 24-35N-29E |
| 3. Kammerzell Farm, Liberty County | 13-31N-05E |

All three durum trials consisted of 14 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 three-point rototiller. 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. Protein, test weight and moisture content were determined using a Foss Infratec 1241 near infrared analyzer. Falling number was determined using a Perten FN1700 according to the FGIS Directive 9180.38. Other variables specific to each individual trial are listed with the current year data tables.

Results:

Please note that research trial yield results recorded under wheat stem sawfly pressure are likely much higher than a producer should expect. Small plot variety trials are managed to assess maximum yield potential and are harvested in such a way that all stems and heads are picked up by the combine, regardless of lodging or cutting due to sawfly. Pickup guards coupled with an extremely slow ground speed and exceptionally low cutting height help researchers collect all heads in order to assess seed yield potential. If you are a producer in a wheat stem sawfly environment, although hollow stemmed varieties may be high yielding in research trials in your area, we strongly recommend against growing those hollow stemmed varieties. Please be aware that if you seed hollow stemmed varieties with sawfly present, you are only creating a breeding ground for future generations of sawfly in your area and not helping combat the pest population.

Cropping environments in 2015 started out below average to marginal with warmer early spring temperatures and

lower than normal precipitation across north central Montana. Greater than normal rainfall was experienced at Turner and Loring resulting in good to excellent durum yields for growers. The Chester locations went into the fall and started out early spring dryer than normal. Timely precipitation was a limiting factor throughout the growing season, resulting in poor durum seed yields near Chester.

At Havre, annual growing season precipitation (9/1/14 through 8/31/15) was 12.05 inches, nearly the same as the average for all years since 1916. April 1 through July 31 precipitation was 7.52 inches or 110 percent of the 100-year average. Heat units expressed as "Growing Degree Days" (GDD, base 50) from May through July totaled 1287, 100 percent of the average for the last 65 years (1951-2015). The last spring frost was on May 20 and the first fall frost of 2015 was on September 27, resulting in 130 frost-free days. The minimum winter temperature was -19 degrees F on November 14, 2014 and February 4 and 5, 2015. Overall, the 2014-2015 crop year temperatures were 2 degrees warmer than the long-term average. The April through July growing season saw an average daily temperature of 57.7 degrees F, similar to historical temperatures. July and August average temperatures were very similar to long-term averages with the high for 2015 recorded on June 29 and August 14 at 98 degrees F. There were 20 days with temperatures 90 degrees F or above, with no days over 100 degrees F.

Following a summer of timely rainfall, the durum trial yields at Turner averaged 30 bu/ac (Table 1). 'Strongfield' was the highest yielding entry at just over 33 bu/ac. 'Alkabo', 'Carpio', 'Joppa', 'Mountrail', 'Tioga' and two experimental lines produced yields ranging from 30 to 33 bu/ac, statistically equal to that of Strongfield. Test weight of all entries averaged 62 lb/bu, while protein averaged 14 percent. Sawfly cutting was nonexistent in the durum trial at Turner. Stand percent, plant height, yield, test weight, moisture, protein, falling number and sawfly data for the 2015 Turner dryland durum trial are summarized in Table 1.

Comparable averages are calculated using a standard long-term check variety when not all entries are present in a specific trial for all years. Variety means are adjusted by multiplying the actual check mean by the ratio of the individual variety mean compared to the check mean for the same years as tested. All varieties are then directly comparable to each other when in the same nursery. A minimum of 3 years of data is necessary to be included in comparable average calculation. Nine-year comparable averages (2006-2015) for durum seed yield and test weight at Turner are summarized in Table 2, while nine-year comparable averages for sawfly cutting are summarized in Table 3.

Loring spring durum yields averaged nearly 42 bu/ac and ranged between 39 and 45 bu/ac. There were no statistical differences in yield of the durum entries at Loring in 2015 (Table 4). Strongfield and MSU release 'Silver' produced the highest protein at 14.9 percent. Sawfly cutting was nonexistent in the durum trial at Loring. Stand percent, plant height, yield, moisture, test weight, protein, falling number and sawfly cutting data, for the 2015 Loring dryland spring durum trial, are summarized in Table 4. Five-year comparable averages for spring durum seed yield and test weight at Loring are summarized in Table 5, while five-year comparable averages for sawfly cutting are summarized in Table 6.

In 2014, an off-station spring durum trial was established near Chester. The lack of timely rainfall events coupled with disease pressure resulted in spring durum yields averaging just over 24 bu/ac. 'MT112444' was the highest yielding entry at nearly 32 bu/ac, while two other MSU breeding lines produced yields statistically equal to that of MT112444 (Table 7). Sawfly cutting in the small plot scenario was minimal in 2015, however all plots exhibited a certain amount of *Fusarium species* disease symptoms, as identified by Schutter Diagnostic Lab. Stand percent, plant height, yield, test weight, moisture, protein, falling number, sawfly cutting and *Fusarium sp.* data for the 2015 Chester dryland spring durum trial are summarized in Table 7. Comparable averages for durum at the Chester site will not be available until the 2016 crop year.

Summary:

This work has been strongly supported by producers near each of the locations, and by the Northern Agricultural 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 twenty-first 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 2015 marking 32 years at the present Turner site. The Chester location was reestablished in 2014 following a prolonged absence of uniform off-station spring cereal testing in Liberty County.

Funding Summary:

Expenditure information for grant index 4W5736 is to be provided by Montana State University, Office of Sponsored

Programs. There is no other grant support for this project.

MWBC CY2016 Grant Submission Plans:

It is planned to utilize an alternative funding source to conduct off-station spring durum trials in the next calendar year.

Recognition:

This research would not have been possible without the assistance of the following summertime hourly employees:
Nathan Chapman, Kasee Clark, Rocky Kuhr, Derek Matosich, Kyla McNamara, Dakota Parsons & Kathy Wesley.

TABLE 1. Dryland Fallow Spring Durum Cultivar Evaluation Nursery Grown Off-Station at the Leon Cederberg Farm, Turner. Northern Agricultural Research Center. Havre, Montana. 2015. (Exp# 15-9851-DUR)

ENTRY	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/ YIELD Bu/Ac	TEST WT Lbs/Bu	MOISTURE %	2/ PROTEIN %	3/ FN seconds	4/ SAWFLY %
ALKABO	PI642020	97.4	24.3	30.5	62.3	9.4	14.1	330	0.0
CARPIO	PI670039	95.8	22.7	33.0	61.2	9.0	14.1	334	0.0
DIVIDE	PI642021	95.8	24.8	27.8	61.7	9.4	14.5	337	0.0
GRENORA	PI642022	95.8	20.9	28.8	62.0	9.5	14.1	344	0.0
JOPPA	D04581	98.4	24.9	30.2	62.5	9.7	14.4	330	0.0
MOUNTRAIL	D901313	99.0	23.9	30.8	60.9	9.5	14.4	321	0.0
SILVER	MT03012	96.8	21.8	29.9	61.5	9.3	14.7	336	0.0
STRONGFIELD	DT665	97.1	24.4	33.4	60.5	9.2	15.0	337	0.0
TIOGA	PI660664	95.8	27.6	31.6	62.5	9.5	14.5	317	0.0
MT101694	CC4	97.8	23.5	31.0	62.8	9.7	13.8	330	0.0
MT101717	CC4	97.8	20.6	28.1	64.1	9.8	13.2	358	0.0
MT112434	Alzada x Cimmyt5	96.2	21.7	25.7	61.7	9.4	13.3	369	0.0
MT112444	Alzada x Cimmyt5	95.2	22.0	28.4	61.9	9.2	13.2	371	0.0
MT112463	Alzada x Cimmyt8	96.8	24.1	31.2	61.6	9.2	13.2	360	0.0
EXPERIMENTAL MEANS		96.8	23.4	30.0	62.0	9.4	14.0	340.9	0.0
LSD (0.05)		4.1	1.7	3.2	0.4	0.4	0.4	11.0	-
C.V.%		2.5	4.3	6.4	0.4	2.7	1.9	1.9	-
P-VALUE (Varieties)		0.7922	<.0001	0.0024	<.0001	0.0378	<.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 durum.

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

3/ FN is the falling number value reported in seconds.

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

Bold indicates highest value within a column.

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

Management Information (15-9851-DUR)

Seeding Date: April 22, 2015
Harvest Date: August 13, 2015
Fertility: 100-20-10 side banded
System: no till
Herbicide: none
Insecticide: none
Previous Crop: Chemical Fallow - Durum
Precipitation: not available

TABLE 2. Nine-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. 2006-2015. (Exp# 9851-DUR)

2/ VARIETY or SELECTION		No. of YEARS TESTED 4/	1/ YIELD (Bushels Per Acre)							TEST WEIGHT (Pounds Per Bushel)								
			2011	2012	2013	3/ 2014	2015	AVE. for YEARS TESTED 4/	% of CHECK YIELD 5/	9-YR COMP. AVE. YIELD 6/	2011	2012	2013	3/ 2014	2015	AVE. for YEARS TESTED 4/	% of CHECK YIELD 5/	9-YR COMP. AVE. YIELD 6/
DT665	STRONGFIELD (+)	9	25.5	24.1	54.3		33.4	29.5	112.1	29.5	60.9	60.6	64.1		60.5	59.2	100.1	59.2
PI642022	GRENORA (+)	9	26.6	22.4	53.2		28.8	27.9	106.1	27.9	61.3	60.1	64.2		62.0	59.2	100.2	59.2
Normanno	NORMANNO	5	8.7	24.6	50.9			31.6	105.6	27.8	59.8	59.7	63.1			59.6	99.1	58.6
YU894-75	ALZADA (P+)	8	24.4	19.5	47.4			26.8	104.0	27.4	61.3	60.8	63.5			59.1	100.4	59.3
MT03012	SILVER (+)	9	24.8	18.7	45.7		29.9	26.8	101.6	26.8	61.0	60.7	63.9		61.5	59.1	100.0	59.1
D901313	MOUNTRAIL (+)	9	26.8	22.6	49.5		30.8	26.3	100.0	26.3	61.2	60.1	63.5		60.9	59.1	100.0	59.1
PI660664	TIOGA (+)	5	26.7	21.9	54.1		31.6	28.7	99.0	26.1	62.2	60.4	64.7		62.5	60.5	100.4	59.3
PI642020	ALKABO (+)	9	23.9	24.3	48.9		30.5	25.8	98.1	25.8	62.7	60.9	64.9		62.3	60.2	101.9	60.2
PI642021	DIVIDE (+)	9	25.2	20.4	50.5		27.8	24.8	94.3	24.8	61.6	61.0	64.3		61.7	59.5	100.6	59.5
PI632366	PIERCE (+)	7	26.1	20.3				21.0	93.9	24.7	62.1	60.8				58.9	101.2	59.8
MEANS (For Entries Listed)			23.9	21.9	50.5		30.4			26.7	61.4	60.5	64.0		61.7			59.3
7/ Grow ing Season Precipitation (in.)			8.3	8.3	n/a	16.4	n/a	8.2										
Soil PAW (in.) to SD @ Planting			7.9	9.4	7.8	8.9	6.3	8.0										
Total Plant Available Water (in.)			16.2	9.4	n/a	n/a	9.9	13.4										
Soil NO3 (lbs.) to SD at Planting			51	12	11	65	49	66										
SD (Sampling Depth in Inches)			48	48	48	48	48	48										
Fertilizer Applied																		
			(# N)	70	70	100	100	100	79									
			(# P ₂ O ₅)	40	40	20	20	20	34									
			(# K ₂ O)	25	25	10	10	10	21									

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 selection decisions.

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

3/ No harvest in 2014 due to hail.

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

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

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

7/ Seeding to 14 days prior to harvest maturity.

TABLE 3. 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. 2006-2015. (Exp# 9851-DUR)

2/ VARIETY or SELECTION		No. of YEARS TESTED	1/ SAWFLY RATING (% of cut and lodged stems)										AVE. for YEARS TESTED	% of CHECK SWFLY 4/	9-YR COMP. AVE. SWFLY 5/
			2006	2007	2008	2009	2010	2011	2012	2013	3/ 2014	2015			
Normanno	NORMANNO	5				0.7	2.3	1.0	1.0	0.7			1.1	6.2	1.2
DT665	STRONGFIELD (+)	9	16.7	10.0	2.3	10.0	13.3	10.0	15.0	0.3		0.0	8.6	44.3	8.6
YU894-75	ALZADA (P+)	8	20.0	6.7	2.3	8.3	8.3	15.0	16.7	2.3			10.0	45.4	8.9
MT03012	SILVER (+)	9	11.7	11.7	2.3	5.7	18.3	18.3	18.3	2.3		0.0	9.8	50.6	9.8
PI642021	DIVIDE (+)	9	26.7	13.3	3.7	5.0	18.3	16.7	13.3	0.7		0.0	10.9	55.7	10.9
PI660664	TIOGA (+)	5					21.7	23.3	26.7	2.0		0.0	14.7	88.0	17.2
PI632366	PIERCE (+)	7	43.3	21.7	8.3	11.7	23.3	33.3	23.3				23.6	96.1	18.7
D901313	MOUNTRAIL (+)	9	48.3	25.0	10.0	8.3	21.7	31.7	26.7	3.7		0.0	19.5	100.0	19.5
PI642020	ALKABO (+)	9	48.3	25.0	15.0	8.7	21.7	46.7	20.0	7.0		0.0	21.4	109.7	21.4
PI642022	GRENORA (+)	9	50.0	33.3	11.7	15.0	25.0	38.3	21.7	3.7		0.0	22.1	113.3	22.1
MEANS (For Entries Listed)			33.1	18.3	7.0	8.1	17.4	23.4	18.3	2.5		0.0			13.8
6/ Growing Season Precipitation (in.)			2.5	7.0	6.6	6.0	10.3	8.3	8.3	n/a	16.4	n/a	8.2		
Soil PAW (in.) to SD @ Planting			8.8	5.8	8.1	7.8	9.0	7.9	9.4	7.8	8.9	6.3	8.0		
Total Plant Available Water (in.)			11.3	12.8	14.6	13.8	19.2	16.2	9.4	n/a	n/a	9.9	13.4		
Soil NO3 (lbs.) to SD at Planting			64	81	71	94	162	51	12	11	65	49	66		
SD (Sampling Depth in Inches)			48	48	48	48	48	48	48	48	48	48	48		
Fertilizer Applied															
			(# N)	70	70	70	70	70	70	100	100	100	79		
			(# P ₂ O ₅)	40	40	40	40	40	40	20	20	20	34		
			(# K ₂ O)	25	25	25	25	25	25	10	10	10	21		

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 selection decisions.

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

3/ No harvest in 2014 due to hail.

4/ Percent of Mountrail cut 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 saw fly rating of a given entry for years tested, y = average saw fly rating for Mountrail for the same years, and z = 9-Yr average saw fly rating for the check variety Mountrail.

6/ Seeding to 14 days prior to harvest maturity.

TABLE 4. Dryland Fallow Spring Durum Cultivar Evaluation Nursery Grown Off-Station at the Flansaas-Lumsden Farm, Loring. Northern Agricultural Research Center. Havre, Montana. 2015. (Exp# 15-9855-DUR)

ENTRY	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/ YIELD Bu/Ac	TEST WT Lbs/Bu	MOISTURE %	2/ PROTEIN %	3/ FN seconds	4/ SAWFLY %
ALKABO	PI642020	95.9	26.2	39.9	61.3	10.0	13.7	347	0.0
CARPIO	PI670039	96.9	25.7	44.3	61.0	10.4	13.8	353	0.0
DIVIDE	PI642021	96.9	24.5	38.6	60.6	9.9	14.1	334	0.0
GRENORA	PI642022	96.8	25.0	40.2	60.5	9.7	14.0	358	0.0
JOPPA	D04581	97.2	27.3	43.0	61.1	10.3	14.0	352	0.0
MOUNTRAIL	D901313	97.8	28.5	43.2	60.4	10.0	14.1	350	0.0
SILVER	MT03012	99.0	21.8	39.7	60.2	9.5	14.9	357	0.0
STRONGFIELD	DT665	98.4	24.9	41.8	60.5	9.8	14.9	352	0.0
TIOGA	PI660664	96.8	31.0	44.9	61.1	9.8	14.5	341	0.0
MT101694	CC4	98.4	22.0	39.4	60.4	10.1	13.5	356	0.0
MT101717	CC4	99.0	21.1	41.1	62.9	10.5	13.4	365	0.0
MT112434	Alzada x Cimmyt5	98.7	20.3	41.7	60.4	9.8	13.3	365	0.0
MT112444	Alzada x Cimmyt5	98.7	22.7	44.6	60.1	9.6	13.5	376	0.0
MT112463	Alzada x Cimmyt8	97.6	20.6	44.4	60.0	9.6	13.5	370	0.0
EXPERIMENTAL MEANS		97.7	24.4	41.9	60.7	9.9	13.9	355.4	0.0
LSD (0.05)		3.4	2.8	4.9	0.8	0.4	0.5	16.5	-
C.V.%		2.1	6.8	7.0	0.8	2.2	2.3	2.8	-
P-VALUE (Varieties)		0.7444	<.0001	0.1322	<.0001	<.0001	<.0001	0.0017	-

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/ FN is the falling number value reported in seconds.

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

Bold indicates highest value within a column.

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

Management Information (15-9855-DUR)

Seeding Date: April 22, 2015
Harvest Date: August 12, 2015
Fertility: 100-20-10 side banded
System: no till
Herbicide: Everest 2.0, 1 oz/ac
Insecticide: none
Previous Crop: Chemical Fallow - Spring Wheat
Precipitation: 8.94"

TABLE 5. Five-Year Yield and Test Weight Summary on Selected Entries from Dryland Fallow Spring Durum Variety Nurseries Grown Off-Station at the Flansaas/Lumsden Farm, Loring. Northern Agricultural Research Center. Havre, Montana. 2011-2015. (Exp# 9855-DUR)

2/ VARIETY or SELECTION		No. of YEARS TESTED	1/ YIELD (Bushels Per Acre)							TEST WEIGHT (Pounds Per Bushel)								
			2011	2012	2013	2014	2015	AVE. for YEARS TESTED	% of CHECK YIELD 3/	5-YR COMP. AVE YIELD 4/	2011	2012	2013	2014	2015	AVE. for YEARS TESTED	% of CHECK TEST WT 3/	5-YR COMP. AVE TEST WT 4/
YU894-75	ALZADA (P+)	4	28.5	24.0	52.7	41.1		36.6	110.2	38.8	61.4	60.5	60.7	56.8		59.8	100.6	60.0
PI670039	CARPIO (+)	3			47.8	39.0	44.3	43.7	106.7	37.5			62.1	56.7	61.0	59.9	100.9	60.2
PI642020	ALKABO (+)	5	29.7	26.9	50.0	39.2	39.9	37.1	105.5	37.1	62.5	60.7	62.4	56.8	61.3	60.8	101.8	60.8
PI660664	TIOGA (+)	5	29.9	26.2	46.2	37.7	44.9	37.0	105.1	37.0	62.0	60.8	61.9	56.0	61.1	60.3	101.1	60.3
DT665	STRONGFIELD (+)	5	30.6	24.2	44.4	40.5	41.8	36.3	103.1	36.3	61.5	60.3	62.0	56.4	60.5	60.1	100.8	60.1
MT03012	SILVER (+)	5	31.0	25.8	45.2	38.6	39.7	36.1	102.5	36.1	60.1	60.4	61.6	56.7	60.2	59.8	100.3	59.8
D901313	MOUNTRAIL (+)	5	28.4	24.7	44.9	34.8	43.2	35.2	100.0	35.2	60.9	59.1	61.2	56.7	60.4	59.7	100.0	59.7
PI642022	GRENORA (+)	5	27.6	25.7	43.4	39.0	40.2	35.2	99.9	35.2	61.3	59.5	60.5	56.2	60.5	59.6	99.9	59.6
PI642021	DIVIDE (+)	5	27.9	24.1	42.5	39.8	38.6	34.6	98.3	34.6	61.7	60.9	62.0	57.7	60.6	60.6	101.5	60.6
Normanno	NORMANNO	3	11.5	26.7	45.3			27.8	85.3	30.0	60.3	59.3	59.6			59.7	98.8	59.0
MEANS (For Entries Listed)			27.2	25.4	46.2	38.9	41.6			35.8	61.3	60.2	61.4	56.7	60.7			60.0
5/ Growing Season Precipitation (in.)			n/a	n/a	9.0	5.6	8.9	7.9										
Soil PAW (in.) to SD @ Planting			7.1	8.8	8.8	8.9	8.2	8.4										
Total Plant Available Water (in.)			2.6	8.8	5.8	n/a	15.4	8.2										
Soil NO3 (lbs.) to SD at Planting			50	34	34	64	41	45										
SD (Sampling Depth in Inches)			48	48	48	48	48	48										
Fertilizer Applied			(# N)	70	70	100	100	100	88									
			(# P ₂ O ₅)	40	40	20	20	20	28									
			(# K ₂ O)	25	25	10	10	10	16									

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 selection decisions.

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

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

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

5/ Seeding to 14 days prior to harvest maturity.

TABLE 6. Five-Year Sawfly Summary on Selected Entries from Dryland Fallow Spring Durum Variety Nurseries Grown Off-Station at the Flansaas-Lumsden Farm, Loring, Northern Agricultural Research Center. Havre, Montana. 2011-2015. (Exp# 9855-DUR)

2/ VARIETY or SELECTION		No. of YEARS TESTED 3/	1/ SAWFLY RATING (% of cut and lodged stems)					AVE. for YEARS TESTED	% of CHECK SWFLY 3/	5-YR COMP. AVE SWFLY 4/
			2011	2012	2013	2014	2015			
Normanno	NORMANNO	3	0.3	1.0	0.3			0.5	4.2	0.3
DT665	STRONGFIELD (+)	5	8.3	3.7	0.7	0.3	0.0	2.6	33.0	2.6
PI670039	CARPIO (+)	3			2.3	0.3	0.0	0.9	34.8	2.7
YU894-75	ALZADA (P+)	4	10.0	5.0	1.0	1.0		4.3	43.2	3.4
PI642021	DIVIDE (+)	5	13.3	3.7	5.0	0.7	0.0	4.5	57.5	4.5
MT03012	SILVER (+)	5	15.0	3.7	3.7	1.0	0.0	4.7	59.3	4.7
PI642022	GRENORA (+)	5	20.0	8.3	6.7	0.3	0.0	7.1	89.8	7.1
D901313	MOUNTRAIL (+)	5	20.0	11.7	7.0	0.7	0.0	7.9	100.0	7.9
PI642020	ALKABO (+)	5	23.3	8.3	8.3	1.0	0.0	8.2	104.1	8.2
PI660664	TIOGA (+)	5	25.0	10.0	8.3	2.0	0.0	9.1	115.2	9.1
MEANS (For Entries Listed)			15.0	6.1	4.3	0.8	0.0			5.0
5/ Growing Season Precipitation (in.)			n/a	n/a	9.0	5.6	8.9	7.9		
Soil PAW (in.) to SD @ Planting			7.1	8.8	8.8	8.9	8.2	8.4		
Total Plant Available Water (in.)			2.6	8.8	5.8	n/a	15.4	8.2		
Soil NO3 (lbs.) to SD at Planting			50	34	34	64	41	45		
SD (Sampling Depth in Inches)			48	48	48	48	48	48		
Fertilizer Applied										
			(# N)	70	70	100	100	100	88	
			(# P ₂ O ₅)	40	40	20	20	20	28	
			(# K ₂ O)	25	25	10	10	10	16	

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 selection decisions.

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

3/ Percent of Mountrail saw fly rating 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 saw fly rating of a given entry for years tested, y = saw fly rating for Mountrail for the same years, and z = 5-Yr saw fly rating for the check variety Mountrail.

5/ Seeding to 14 days prior to harvest maturity.

TABLE 7. Dryland Fallow Spring Durum Cultivar Evaluation Nursery Grown Off-Station at the Kammerzell Farm, Chester. Northern Agricultural Research Center. Havre, Montana. 2015. (Exp# 15-9853-DUR)

ENTRY	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/ YIELD Bu/Ac	TEST WT Lbs/Bu	MOISTURE %	2/ PROTEIN %	3/ FN seconds	4/ SAWFLY %
ALKABO	PI642020	90.6	24.0	21.7	57.8	9.3	16.4	332	0.3
CARPIO	PI670039	90.3	22.9	19.4	56.6	9.4	17.6	338	0.0
DIVIDE	PI642021	94.5	24.6	20.0	57.8	9.2	17.6	351	0.7
GRENORA	PI642022	91.3	22.3	21.9	57.6	9.3	16.3	333	0.0
JOPPA	D04581	96.7	25.6	22.7	57.9	9.2	17.6	340	0.3
MOUNTRAIL	D901313	94.8	23.6	22.2	56.2	9.0	18.6	343	0.0
SILVER	MT03012	97.4	22.8	24.1	56.0	9.0	17.9	351	0.7
STRONGFIELD	DT665	96.1	24.0	24.3	57.8	9.3	18.4	349	0.7
TIOGA	PI660664	92.5	26.0	21.5	57.6	9.2	18.4	354	2.0
MT101694	CC4	96.7	21.3	24.4	60.0	9.3	16.4	347	1.0
MT101717	CC4	98.1	22.3	25.5	60.7	9.2	16.5	367	0.7
MT112434	Alzada x Cimmyt5	96.1	21.0	29.5	58.6	9.0	15.9	365	0.3
MT112444	Alzada x Cimmyt5	95.8	23.3	31.8	58.1	8.9	16.0	361	0.3
MT112463	Alzada x Cimmyt8	93.8	23.1	29.1	57.9	9.0	16.0	354	0.0
EXPERIMENTAL MEANS		94.6	23.3	24.2	57.9	9.2	17.1	348.8	0.5
LSD (0.05)		6.8	1.4	3.4	0.7	0.2	0.7	14.2	1.2
C.V.%		4.3	3.6	8.4	0.7	1.3	2.5	2.4	147.8
P-VALUE (Varieties)		0.3247	<.0001	<.0001	<.0001	0.0002	<.0001	0.0002	0.2

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/ FN is the falling number value reported in seconds.

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

Bold indicates highest value within a column.

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

Management Information (15-9853-DUR)

Seeding Date: April 19, 2015
Harvest Date: August 7, 2015
Fertility: 100-20-10 side banded
System: no till
Herbicide: none
Insecticide: none
Previous Crop: Chemical Fallow - Spring Wheat
Precipitation: 4.99"