

PROJECT TITLE: Evaluation of spring durum variety performance in trials near Moccasin, Denton, Fort Benton, and Winifred.

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OBJECTIVES:

To evaluate the performance of spring durum varieties in environments and cropping methods representative of the southern triangle and central Montana.

RESULTS:

Yield – Durum yields were below average at all locations except the Denton site where yields were equal to the 4-year average for that location (Table 1). McNeal spring wheat was used as a check at all sites and out-yielded all durum varieties tested. Utopia, Mountrail, Maier, and Plenty produced greater yields than McNeal for some location sites, but their average across the four locations as well as their long-term averages for any one location were below that of McNeal. Multi-year summaries for each location are reported in Tables 5, 6, 7, and 8.

Test Weight – Test weights were below average at all sites this year with the average over all sites and all cultivars being 57.5 lbs/bu (Table 2). Test weights at the Denton and Winifred sites were 58.3 and 58.7 lbs/bu, respectively. Test weights were lowest at the Fort Benton site where moisture was most limited. Lebsock had the highest test weight of all cultivars when averaged across the four locations. At Moccasin the experimental line, GM 90002, had a test weight of 59.6 lbs/bu. Vic, Ben, and Medora also had some of the higher test weights reported at this site.

Plant Height – Plant heights ranged from 21 to 35 inches with a mean height of 28 inches averaged across all locations (Table 3). Plenty consistently topped the height list in all locations in addition to Kyle and Ben. Monroe was also one of the taller varieties at the Moccasin site. Plaza was the shortest cultivar tested with an average height of 24 inches.

Protein – High grain protein values accompanied low test weights this year (Table 4). Protein percentages were lowest at the Denton and Moccasin sites with 16.5% being the average. Proteins at the Moccasin site were highest averaging 17.5%. Munich, Maier, Sceptre, and Plenty averaged the highest grain proteins across the four locations. Medora had a grain protein of 18.8% at the Moccasin site.

SUMMARY:

The Uniform Statewide Durum trial planted at Moccasin consisted of 20 entries with McNeal planted as a hard red spring wheat check. The off-station trials planted at Denton, Fort Benton, and Winifred consisted of 10 entries plus McNeal as a check. Low rainfall at the Fort Benton site was very apparent in all parameters measured in the durum trials. No cultivar yielded as well as McNeal spring wheat when averaged across the four locations, however, several entries planted at Moccasin in the Statewide nursery yielded as well or higher than McNeal. Utopia yielded 35 bu/a compared to McNeal with 31 bu/a. Mountrail, Maier, Plenty, and Kyle out-yielded McNeal at the Winifred site. Inadequate moisture levels and timing of rainfall contributed to low test weights at all sites and higher than average grain protein. A test weight of 60 lbs/bu or greater is desirable in a durum variety. While several cultivars came close to this standard, Lebsock tested the highest with a four-location average of 59.2 lbs/bu. Grain proteins for all cultivars were well above the 13.5% minimum standard acceptable to buyers.

FUTURE PLANS:

Spring durum variety evaluations will continue at Moccasin, Denton, Fort Benton, and Winifred. The Uniform Statewide trial with 20 entries will be planted at Moccasin. The off-station trials at Denton, Fort Benton, and Winifred will consist of six entries with Kyle being the check.

Table 1. 2000 Multi-Location summary of durum variety yield in Central Montana.
Central Agricultural Research Center, Moccasin, Montana

Variety	Exp.# :	CARC	Denton	FTBenton	Winifred	Average
		No-Till RC	Till -RC	No-Till RC	Till-Fallow	
		9870	9871	9872	9873	
McNeal		31	31	18	33	28
Mountrail		28	26	15	36	26
Maier		30	23	14	35	26
Plenty		27	25	14	34	25
Lebsock		30	26	14	30	25
Munich		31	26	14	27	25
Belzer		29	24	13	33	25
Plaza		30	24	12	31	24
Kyle		29	23	11	34	24
Ben		27	24	14	29	24
Sceptre		28	24	13	27	23
GM 90002		32				
GM 90003		27				
Laker		28				
Medora		24				
Monroe		27				
Renville		24				
Utopia		35				
Vic		31				
Ward		27				
Mean		28.8	25.0	13.9	31.7	24.8
LSD (0.05)		3.82	2.13	2.1	6.55	

High and low entries for each location are in bold and entries are listed by mean yield.

Planting Date:	4/12/00	4/28/00	4/28/00	4/17/00
Harvest Date:		8/8/00	8/10/00	8/8/00
Previous Crop:		Lentils		Fallow
Fertilizer (lbs N/a):	90	90	90	90
Precipitation (inches):	7.33	8.31	3.9	9.49
Producer/Cooperator:		Barber	Birkeland	Udelhoven

Table 2. 2000 Multi-Location summary of durum variety test weight in Central Montana.
Central Agricultural Research Center, Moccasin, Montana

Variety	Exp.# :	CARC No-Till RC	Denton Till -RC	FTBenton No-Till RC	Winifred Till-Fallow	Average lbs/bu
		9870	9871	9872	9873	
Lebsock		57.7	60.2	58.6	60.3	59.2
Ben		58.5	59.5	57.3	59.9	58.8
Maier		57.5	59.1	56.7	59.3	58.2
Kyle		57.8	58.3	55.7	58.9	57.7
Plenty		57.2	58.7	55.3	59.0	57.6
Munich		55.6	58.2	57.5	58.3	57.4
Plaza		56.5	58.0	55.7	58.3	57.1
Mountrail		56.4	57.9	55.0	58.7	57.0
Belzer		56.6	58.3	53.9	57.5	56.6
Sceptre		55.8	57.4	55.2	57.9	56.6
McNeal		53.3	56.1	54.6	58.1	55.5
GM 90002		59.6				
GM 90003		55.5				
Laker		56.6				
Medora		58.4				
Monroe		56.8				
Renville		56.5				
Utopia		55.4				
Vic		59.2				
Ward		57.3				
Mean		56.91	58.34	55.94	58.75	57.5
LSD (0.05)			0.71	0.94	0.96	

High and low entries for each location are in bold and entries are listed by mean test weight.

Table 3. 2000 Multi-Location summary of durum variety plant height in Central Montana.
Central Agricultural Research Center, Moccasin, Montana

Variety	Exp.# :	CARC	Denton	FTBenton	Winifred	Average lbs/a
		No-Till RC	Till -RC	No-Till RC	Till-Fallow	
		9870	9871	9872	9873	
Plenty		32	35	30	33	32.6
Kyle		34	34	27	30	31.3
Ben		32	32	24	30	29.4
Belzer		32	30	23	32	29.2
Mountrail		29	30	23	29	27.8
Sceptre		29	27	24	30	27.6
Maier		28	29	24	28	27.3
Lebsock		30	29	22	28	27.3
McNeal		28	28	23	28	26.8
Munich		28	27	22	25	25.6
Plaza		24	27	21	24	24.0
GM 90002		26				
GM 90003		24				
Laker		25				
Medora		33				
Monroe		34				
Renville		32				
Utopia		25				
Vic		33				
Ward		33				
Mean		29.7	29.8	23.9	28.8	28.0
LSD (0.05)		2.11				

High and low entries for each location are in bold and entries are listed by mean height.

Table 4. 2000 Multi-Location summary of durum variety protein in Central Montana.
Central Agricultural Research Center, Moccasin, Montana

Variety	Exp.#	CARC	Denton	FTBenton	Winifred	Average
		No-Till RC	Till -RC	No-Till RC	Till-Fallow	
		9870	9871	9872	9873	
Maier		18.3	16.9	20.3	17.3	18.2
Munich		19.1	16.6	19.2	17.8	18.2
Sceptre		18.6	16.3	20.1	17.3	18.1
Plenty		17.9	17.1	20.1	16.9	18.0
Ben		17.9	16.6	19.9	17.2	17.9
Lebsock		17.5	16.6	19.1	16.9	17.5
Plaza		18.2	16.4	19.2	16.2	17.5
Kyle		16.2	17.2	20.1	16.3	17.4
Mountrail		17.1	16.2	19.8	16.2	17.3
McNeal		17.7	16.3	18.4	16.6	17.3
Belzer		16.6	16.0	19.0	16.0	16.9
GM 90002		16.6				
GM 90003		16.2				
Laker		16.0				
Medora		18.8				
Monroe		17.9				
Renville		17.8				
Utopia		16.3				
Vic		16.7				
Ward		17.9				
Mean		17.5	16.56	19.55	16.79	17.7

High and low entries for each location are in bold and entries are listed by mean protein.

Table 5. Moccasin Re-Crop Spring Durum Multi-Year Yield Summary of Selected Varieties.
Central Agricultural Research Center, Moccasin, MT.

Selected Varieties	1996	1997	1998	1999	2000	Average
	----- bu/a -----					
McNeal ^{1/}	24	65	32	41	31	38.6
Monroe	23	56	33	31	27	34.0
Laker	23	50	34	34	28	33.8
Medora	23	51	29	31	24	31.6
Ben	23	53	33	32	27	33.6
Renville	22	59	29	34	24	33.6
Ward	22	50	27	32	27	31.6
Kyle	21	56	31	32	29	33.8
Vic	21	58	35	31	31	35.2
Plenty	20	56	32	34	27	33.8
Munich	20	57	33	34	31	35.0
Sceptre			33	33	28	31.3
Nursery Mean	21.8	55	31.4	34	28.8	

^{1/} McNeal is used as a hard red spring wheat check.

Table 6. Denton Re-Crop Spring Durum Multi-Year Yield Summary of Selected Varieties.
Central Agricultural Research Center, Moccasin, MT.

Selected Varieties	1997	1998	1999	2000	Average
	----- bu/a -----				
McNeal ^{1/}	43	34	21	31	32.2
Ben	30	28	12	24	23.4
Kyle	28	33	17	23	25.3
Plenty	24	26	10	25	21.2
Munich	24	29	12	26	22.8
Sceptre		29	15	24	22.6
Nursery Mean	26.8	28.3	14.5	25.0	

^{1/} McNeal is used as a hard red spring wheat check.

Table 7. Fort Benton Re-Crop Spring Durum Multi-Year Yield Summary of Selected Varieties.
Central Agricultural Research Center, Moccasin, MT.

Selected Varieties	1998	1999	2000	Average
	----- bu/a -----			
McNeal ^{1/}	19	33	18	23.5
Ben	17	25	14	18.7
Kyle	16	25	11	17.1
Plenty	17	32	14	21.1
Munich	18	27	14	19.5
Sceptre	17	29	13	19.7
Nursery Mean	17.6	26.8	13.9	

^{1/} McNeal is used as a hard red spring wheat check.

Table 8. Winifred Re-Crop Spring Durum Multi-Year Yield Summary of Selected Varieties.
Central Agricultural Research Center, Moccasin, MT.

Selected Varieties	1998	1999	2000	Average
	----- bu/a -----			
McNeal ^{1/}	47	44	33	41.5
Ben	41	33	29	34.0
Kyle	39	33	34	35.2
Plenty	36	31	34	33.8
Munich	41	35	27	34.4
Sceptre	39	33	27	33.0
Nursery Mean	38.7	34.3	31.7	

^{1/} McNeal is used as a hard red spring wheat check.