

The agronomic performance of spring wheat varieties in 2007 Central Montana trials.

by Dave Wichman

At the start of the 2007 growing season the spring wheat yield potential looked very good. Mid-late April seeding conditions were generally good. Early May precipitation was much above average. However, in late May through July precipitation levels fell below average and summer temperatures were above average. The summer growing conditions caused substantial stress to late maturing spring crops including spring wheat. Grain test weight is the primary spring wheat yield component affected by late season stress.

The 2007 spring wheat location yield means ranged from 23 to 40 bu/a. The variety Vida had the highest three location mean yield at 34.9 bu/a and Fortuna had the lowest at 27.4 bu/a (Table 1). Even at the low yield location, Denton, Fortuna was significantly lower yielding (0.05) than all but the next three lowest yielding spring wheat entries. Freyr and three experimental lines had yields similar to the highest yielding variety at all three locations. The Geraldine location, placed on a fallow deep soil site, provided an opportunity for the yield potentials of the spring wheat varieties to show. At Geraldine, there was a 15 bu/a acre yield difference between the top yielding Vida and the lowest yielder, Fortuna. Agawam, West Bred 926 and Explorer headed first at Moccasin.

Multi-year yield summaries, for Moccasin, Denton and Geraldine, show that McNeal is still the yield standard for no-till recrop at Moccasin, but is more of a run of the mill variety at Denton and Geraldine (Table 2, 3, 4). Vida generally performs at a yield level above the other varieties at all three locations.

Test weights were below grain standards at all three central Montana locations in 2007 due to mid-late growing season moisture and heat stress. The Moccasin location had the lowest test weights with a mean of only 53.2 lbs/bu (Table 5). There is the possibility that nematodes impacted the Moccasin test weights in addition to the weather stress. The test site was within 150 feet of where nematodes were found in 2005. Agawam had the high test weight at all three locations followed by Scholar and two experimental lines for high three location mean test weights.

Fortuna had the highest average protein content, at 16.1 %, single rep sampling across the three locations. The higher protein content in Fortuna is expected because of its lower yields. Calculating pounds protein per acre (yield x protein content) shows that across the three locations, Vida and Choteau produced 310 and 287 lbs/a, respectively, compared to 264 lbs/a by Fortuna.

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Table 1 2007 Central Montana spring wheat variety performance summary
 Exp 997007 Central Agricultural Research Center. Moccasin, Montana.

Pedigree	CARC	3 Loc Ave	Grain Yield			3 Loc Yld
	Head Date	Height	CARC	Denton	Geraldine	Average
	d of y	cm	bu/a	bu/a	bu/a	bu/a
Vida	178	73	30.7	24.6	49.5	34.9
MT 0415	178	79	32.1	22.8	45.9	33.6
Freyr	178	77	32.7	23.5	44.3	33.5
MT 0515	178	76	35.5	22.8	40.6	33.0
MT 0414	177	79	33.4	23.6	40.7	32.6
Westbred 926	174	74	31.0	24.2	42.0	32.4
Scholar	179	87	29.2	22.7	44.7	32.2
Choteau	177	71	31.9	22.5	40.3	31.5
Conan	176	74	30.6	22.2	41.7	31.5
Corbin	176	74	32.8	23.0	38.5	31.5
Outlook	180	77	31.9	22.8	39.6	31.4
Agawam	173	72	29.6	23.2	41.2	31.3
Hank	176	75	31.6	23.6	37.2	30.8
Reeder	178	77	31.4	21.1	39.5	30.7
NorPro	178	72	28.8	21.8	38.9	29.8
McNeal	179	77	33.4	24.0	30.9	29.4
Knudsen	178	74	28.5	23.0	36.6	29.4
Explorer	174	76	30.4	23.5	33.9	29.2
Ernest	179	88	28.5	20.5	35.7	28.2
Fortuna	178	87	29.6	18.5	34.0	27.4
Mean	177.2	76.9	31.2	22.7	39.8	31.2
CV 1	0.4307		7.1	9.6	14.9	
LSD (0.05)	1.262		3.63	3.59	9.83	
Seed Date:			17-Apr-07	27-Apr-07	2-May-07	
Harvest Date:			13-Aug-07	13-Aug-07	13-Aug-07	
Soil Temp (2" depth) at seeding:			8 C	8 C	10 C	
Soil moisture probe depth at seeding:			21-25"	24-30"	28	
Fertilizer:	10-10-10-5 NPI	Top dress:	45 N	60 N	60 N	

Table 2 Moccasin multi-year performance of spring wheat varieties under no-till CC.
Exp 9970 Central Agricultural Research Center, Moccasin, Montana.

	2003	2004	2005	2006	2007	average	McNeal Yld Same Yrs
	bu/a	bu/a	bu/a	bu/a	bu/a	bu/a	bu/a
McNeal	23	28	28	25	33	27.4	27.4
Agawam			28	24	30	27.2	28.8
Choteau	21	28	22	25	32	25.6	27.4
Conan	17	28	30	24	31	25.9	27.4
Corbin					33	32.8	33.4
Ernest	18	24	28	23	29	24.4	27.4
Explorer	17	26	27	23	30	24.7	27.4
Fortuna	22	28	24	24	30	25.4	27.4
Freyr				21	33	26.8	29.1
Hank	17	30	28	25	32	26.3	27.4
Knudsen			23	24	29	24.9	28.8
NorPro			27	28	29	27.9	28.8
Outlook	22	31	26	22	32	26.4	27.4
Reeder	20	30	26	24	31	26.3	27.4
Scholar	19	28	29	25	29	26.0	27.4
Vida		30	31	28	31	29.9	28.7
Westbred 926	19	27	31	23	31	26.1	27.4
Means	19.3	27.9	27.6	24.6	31.2		

Bold numbers indicate varieties with mean yields \geq McNeal for the same years.

Table 3 2007 Denton multi-year spring wheat variety yield performance on no-till CC.
Exp 9971 Central Agricultural Research Center, Moccasin, Montana.

Pedigree	2003	2004	2005	2006	2007	Average	McNeal Yld Same Yrs.
	bu/a	bu/a	bu/a	bu/a	bu/a	bu/a	bu/a
McNeal	15	32	26	24	24	24.3	24.3
Agawam			29	28	23	26.6	23.3
Choteau	16	34	24	22	22	23.7	24.3
Conan	17	32	25	24	22	24.1	24.3
Corbin					23	23.0	
Ernest	16	28	23	24	21	22.3	24.3
Explorer	18	33	24	23	23	24.2	24.3
Fortuna	18	29	26	26	19	23.5	24.3
Freyr				24	24	23.6	22.2
Hank		34	28	25	24	27.5	24.8
Knudsen			22	23	23	22.6	23.3
NorPro			26	25	22	24.2	23.3
Outlook	18	36	27	25	23	25.7	24.3
Reeder	17	36	26	25	21	25.1	24.3
Scholar	18	32	23	24	23	24.0	24.3
Vida	17	37	29	27	25	26.8	24.3
Westbred 926	17	35	29	24	24	26.0	24.3
Mean	16.9	32.8	25.9	24.87	22.7		

Bold numbers indicate varieties with mean yields \geq McNeal for the same years.

Table 4 Two year spring wheat variety performance on fallow near Geraldine.
Exp 997207 Central Agriucultural Research Center. Moccasin, Montana.

Pedigree	2007 Yield	2005 Yield	2 year Ave. Yld
	bu/a	bu/a	bu/a
Vida	49.5	15.3	32.4
Agawam	41.2	15.8	28.5
Scholar	44.7	11.0	27.8
Westbred 926	42.0	13.2	27.6
Conan	41.7	13.0	27.3
Choteau	40.3	12.2	26.2
Reeder	39.5	12.4	26.0
Outlook	39.6	11.4	25.5
Hank	37.2	12.3	24.8
Knudsen	36.6	11.9	24.3
NorPro	38.9	9.6	24.2
Ernest	35.7	12.4	24.1
Fortuna	34.0	13.8	23.9
Explorer	33.9	12.2	23.0
McNeal	30.9	13.2	22.1
Freyr	44.3		
Corbin	38.5		
Mean	39.79	12.6	

Table 5 2007 Central Montana spring wheat variety performance trial.
 Exp 997007 Central Agricultural Research Center. Moccasin, Montana.

Pedigree	Test Weight				Protein Content			
	CARC	Denton	Geraldine	3 Loc Average	CARC	Denton	Geraldine	3 loc Average
	lbs/bu	lbs/bu	lbs/bu	lbs/bu	%	%	%	%
Agawam	55.4	58.8	61.5	58.5	14.4	14.1	13.9	14.1
MT 0515	54.6	57.7	60.8	57.7	14.9	14.0	15.3	14.7
Scholar	54.4	57.8	60.3	57.5	15.9	15.2	16.0	15.7
MT 0415	55.3	57.2	59.2	57.2	15.8	15.2	16.1	15.7
Knudsen	53.5	57.5	59.8	56.9	15.5	15.3	14.5	15.1
MT 0414	54.9	56.6	59.3	56.9	15.0	14.5	16.1	15.2
Reeder	54.0	56.5	59.8	56.7	14.9	15.3	15.3	15.2
Freyr	52.9	57.6	59.7	56.7	15.5	14.9	15.0	15.1
Conan	53.9	56.5	59.5	56.6	15.2	15.9	15.2	15.4
Ernest	53.5	56.9	58.8	56.4	15.7	15.5	16.4	15.9
Choteau	53.7	55.9	59.3	56.3	14.6	15.5	15.4	15.2
Vida	53.5	56.9	58.5	56.3	14.9	14.2	15.4	14.8
Fortuna	53.9	56.0	58.4	56.1	14.9	17.0	16.5	16.1
Explorer	52.9	56.1	58.9	55.9	15.7	15.4	15.2	15.4
Corbin	52.4	55.7	59.7	55.9	15.9	14.7	14.7	15.1
McNeal	52.3	56.1	57.6	55.3	15.1	15.0	16.2	15.4
NorPro	50.9	55.7	59.1	55.2	15.3	15.1	14.9	15.1
Outlook	51.4	54.9	57.9	54.7	14.5	15.3	15.0	14.9
Westbred 926	50.7	55.0	57.4	54.3	15.8	15.8	15.7	15.8
Hank	50.7	53.7	56.2	53.5	15.8	15.0	15.7	15.5
Mean	53.21	56.43	59.05	56.2	15.26		15.42	15.3
CV 1	0.8701	1.108	0.9817					
LSD (0.05)	0.969	1.308	1.213					