

**Colorado
State
University**

**2007
Small
Grain
Research
Report**

Extension



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2007

Small Grain Variety Performance Trials

San Luis Valley Research Center

Center, Colorado

Merlin A. Dillon, Area Extension Agent, Agronomy
SLV Research Center, 0249 E. Road 9N, Center, CO 81125

Summary

Each year small grain variety performance tests are conducted at the San Luis Valley Research Center to identify varieties of wheat, barley, oats and other small grains that are productive and adapted for commercial production in the San Luis Valley. **Yields of small grains were fairly poor again because of a lingering soil problem. Soil samples this year determined the problem to be extremely high levels of Cereal Cyst Nematode (CCN). Some cultivars of small grains may have tolerance to CCN and, therefore, all results need looked at with this in mind. Comparing cultivars likely would be different without the CCN infestation.**

The 2007 season can be characterized as very similar to 2006. It was very warm until July; then it was rainy and heavy dews during July and August. There was, however, less problems with malt barley quality this year. Heading dates were early again. Grain yields in the soft white spring (SWS) wheat trial were below recent yields, 111 bu/acre. Grain yields in the hard red spring (HRS) and durum wheat trial were also very poor, averaging 94 bu/acre. Grain yields in the barley trial were good, but lower than last year; averaging 137 bu/acre. The oat variety performance trial produced fairly good yields, averaging 146 bu/acre.

Introduction and Objectives

Small grains of various kinds of wheat, barley and oats have been produced in the San Luis Valley for many years. Oat acreage has greatly declined from historically high; however, oats are grown on 27,000 acres in 2004, mostly harvested for hay or for alfalfa cover crop seedings. Wheat and barley are still very important Valley crops, although acreage varies. Wheat acreage varies greatly depending on the wheat price. Wheat acreage has ranged from 11,000 to 32,000. Drought reduced wheat acreage to only 10,500 harvested acres in 2004. Malt barley acreage is dominated by Coors contracts (38,000 acres) with a small acreage of other malt barley or feed barley varieties. Wheat types also vary with demand and grower preferences. Durum acreage increased this year because of the contract price. SWS acreage varies with price; the dominant market being in Denver. HRS acreage is somewhat replaced by hard white spring wheat. Winter wheat acreage is very small. The objective of this research was to evaluate variety and experimental lines performance under high-yield center pivot conditions in the San Luis Valley.

Materials and Methods

These field research studies were conducted at the San Luis Valley Research Center or sometimes on neighboring farms. The wheat, barley, and oat trials this year were located at the Research Center but the sunflower trial was on John Haws Farm about 2 miles away. All trials are conducted as a randomized complete block design with four replications. This means all varieties were planted on the same day, irrigated and otherwise treated the same all season and all plots were also harvested the same. Each variety is planted four times in randomized location within the trial. Plots are planted to 35 foot lengths and trimmed at harvest to about 30 foot. Nine rows are planted in 8-inch rows which makes a plot 6 feet wide. Unless the plots are severely lodged, only the middle 7 rows (4.7 feet) are harvested with the Hege combine.

Entry fees are solicited for privately owned varieties. Wheat yields are corrected to 12% moisture and 60 lbs/bushel. For barley, yields are corrected to 48 lbs/bushel and oats are corrected to 38 lbs/bushel. Sunflower is reported as pounds per acre dry matter. Wheat protein and hardness are determined by the wheat breeding program at Colorado State University. Malt barley protein and screenings are tested at the Coors Brewing Co. office.

Table 1. 2007 Hard Spring Wheat Variety Performance Trial at Center¹. Merlin A. Dillon, Area Extension Agronomist.

.....Results severely affected by presence of high populations of Cereal Cyst Nematode.....

Variety	Wheat Type ^{2/}	Grain Yield ^{3/}	Bushel Weight	Heading Date ^{4/}	Grain Moisture	Plant Height	Grain Protein
		bu/ac	lbs/bu	(June)	%	in.	%
Plata	HWS	116.2 a ^{5/}	61.6	27.9	10.6	28.8	11.1
Centennial	SWS	114.1 ab	61.5	31.2	11.1	28.3	10.2
Lochsa	HWS	100.2 abc	60.6	32.4	11.2	30.0	11.3
Duraking +N	Durum	99.5 abc	62.1	28.5	11.0	24.5	12.5
Lolo	HWS	99.4 abc	62.8	33.0	11.6	30.0	10.9
Jerome	HRS	97.8 abc	61.4	30.6	11.1	25.0	12.6
Blanca Grande	HWS	94.0 bcd	61.2	26.4	10.7	23.5	12.4
Orita	Durum	89.6 cd	60.0	27.9	10.3	24.0	11.1
Pristine	HWS	88.6 cd	62.5	30.6	11.2	25.3	12.6
Hank	HRS	88.3 cd	61.0	30.3	11.2	27.8	11.5
WB 881	Durum	88.2 cd	61.4	30.3	11.1	26.8	11.4
Nora	HRS	86.6 cd	61.7	28.2	10.9	30.5	14.6
Duraking	Durum	83.8 cd	61.8	27.0	11.2	24.3	11.4
Cavalier	HWS	82.9 cd	59.2	22.5	10.6	24.3	13.8
Yecora Rojo	HRS	73.8 d	59.8	21.9	11.1	23.0	11.8
Trial Average		93.5	61.2	28.6	11.0	26.4	12.0
LSD, 10%		10.8	0.34	1.56	0.33	1.26	1.18
CV, %		9.72	0.47	4.59	2.50	4.00	8.33

¹ San Luis Valley Research Center, Center, CO.

² Wheat Types: SWS is soft white spring; HRS is hard red spring; HWS is hard white spring, etc.

³ Grain yield based on 60 lbs/bushel and 12 % moisture.

⁴ Days after June 1.

⁵ Tukey-s Test: yields followed by the same letters are not statistically different.

Site Information:

Date Planted: April 23

Irrigation: center pivot

Herbicide: Bronate, 1.6 pt/acre

Nitrogen: 100 lb/ac + 30 lb/ac fertigation

Previous Crop: Potatoes

Date Harvested: August 30

Seed Rate: 120 lbs/acre

Row Spacing: 8-inch

Plot Size: 6 ft. x 35'; 9 rows planted 8 nches

Comments:

Vegetative growth this year was poor starting from early tillering; plants were stunted and tillered poorly. Soil samples revealed high levels of Cereal Cyst Nematode (3661/250 g soil). This level of CCN would cause 70% yield loss in spring wheat in Oregon).

Field trial results likely reflects tolerance by certain cultivars, some varieties had good growth whereas right beside them other varieties showed poor growth.

Weed control was pretty good this year. However, the field trial resulted in poor yields, averaging only 93.5 bu/acre. Even though yields were poor, this was a good trial statistically; finding yield differences between varieties. Repeating this trial in an area without the CCN

likely would produce different results; favoring other cultivars when grown without CCN.

Wet, humid and cool conditions caused some *Xanthomonas* (bacterial) leaf blight; however, bushel weights were still excellent, averaging 61.2 lbs/bu.

Plant heights were short, even shorter than last year, averaging only 26.4 inches. Heading dates were a little earlier than normal, especially considering the April 23 planting date. Grain was very dry at harvest.

Protein contents were fairly low, averaging 12%. Duraking was entered twice, once without and with an additional 40 lbs N/acre at heading. Adding 40 lbs N/acre increased the grain protein from 11.4 to 12.5%, an increase of 1.1%. Nora had the highest protein content of 14.6 % and Centennial soft white spring wheat had the lowest at 10.2 %.

Table 11. 2007 Protein Enhancement Trial on Lolo, Jerome and Lochsa hard wheats, Merlin A. Dillon, Area Extension Agronomist, Center¹, CO 81125.

Nitrogen Treatment ⁴	Grain Yield ²	Bushel Weight	Grain Protein ³
	bu/ac	lbs/bu	%
Lolo, Hard White Spring Wheat			
0	--	63.2	10.1
30	--	62.8	11.5
60	--	63.0	11.6
Trial Average	99.2	63.0	11.1
LSD, .10	--	N S	0.92
CV %	--	0.7	6.1
Jerome, Hard Red Spring Wheat			
0	--	61.4	10.8
30	--	61.8	11.8
60	--	61.8	12.6
Trial Average	113.7	61.7	11.7
LSD, .10	--	NS	0.61
CV %	--	0.9	3.8
Lochsa, Hard White Spring Wheat			
0	96.4	60.6	12.1
30	97.0	60.4	12.6
45	102.9	60.3	12.6
60	96.3	60.4	12.2
Trial Average	98.1	60.4	12.4
LSD, .10	NS	N S	NS
CV %	6.4	0.6	10.6

¹ San Luis Valley Research Center, Center, CO.

² Grain yield based on 60 lbs/bushel and 12 % moisture.

³ Grain protein determined by the Wheat Breeding Project at CSU, Dr. Scott Haley.

⁴ Nitrogen applied at heading.

Site Information:

Previous Crop: potatoes

Date Planted: April 16

Irrigation: center pivot

Herbicide: Bronate; 1.6 pint/acre

Nitrogen: 140 preplant + 30 sprinkler

Nitrogen at Heading: June 26

Date Harvested: August 31

Seed Rate: 120 lbs/acre; durum at 150 lbs/acre

Row Spacing: 8-inch

Plot Size: 6 ft. x 35'; 9 rows planted 8 inches apart

Comments:

Yields reduced and trial influenced by heavy infestation of Cereal Cyst Nematode.

Nitrogen applied at heading on these hard wheat varieties generally had no effect on grain yield. In fact, grain yield was measure in only one of the three trials.

Nitrogen applied at heading significantly improved grain protein in 2 of the three replicated trials. Proteins were very low, ranging from 10-12%. For Lolo, applying nitrogen at heading improved grain protein significantly (p=.04). Protein content was 10.1% with no N; 11.5% with 30 lbs N/ac at heading; and 11.6% with 60 lbs/acre.

For Jerome, nitrogen applied at heading improved grain protein significantly (p=.01). Protein content was 10.8% with no N; 11.8% with 30 lbs N/ac at heading; and 12.6% with 60 lbs/acre. The results were pretty much as expected for Lolo and Jerome; adding 30 lbs N/ac increased protein about 1%.

For Lochsa, applying N at heading did not improve grain protein. Variability, as measured by the CV%, was higher in the Lochsa trial.

**Table 1. 2007 Soft White Spring Wheat Variety Performance Trial at Center¹.
Merlin A. Dillon, Area Extension Agronomist.**

**.....Results severely affected by presence of high populations
of Cereal Cyst Nematode.....**

Variety	Grain Yield ^{3/}	Bushel Weight	Heading Date ^{4/}	Grain Moisture	Grain Protein
	bu/ac	lbs/bu	(June)	%	%
IDO 599	140.8 a ^{5/}	60.1	25.5	12.4	10.1
IDO 632	132.7 a	59.3	23.3	12.8	9.6
Alturas	124.0 ab	60.8	26.5	12.0	9.3
IDO 629 wxy	112.7 bc	60.2	29.3	11.5	10.3
IDO 630 wxy	102.7 cd	59.7	26.8	12.4	10.1
IDO 645	100.2 cd	59.1	25.8	12.4	9.7
Centennial	87.5 d	60.3	25.5	12.2	9.9
IDO 563	83.4 d	60.3	23.5	12.9	10.0
Trial Average	110.5	59.9	25.8	12.3	9.9
LSD, 10%	10.9	0.61	1.28	0.61	0.60
CV, %	8.06	1.08	4.09	4.05	3.22

¹ San Luis Valley Research Center, Center, CO.

³ Grain yield based on 60 lbs/bushel and 12 % moisture.

⁴ Days after June 1.

⁵ Tukey-s Test: yields followed by the same letters are not statistically different.

Site Information:

Date Planted: April 11

Irrigation: center pivot

Herbicide: Bronate, 1 pt/acre

Nitrogen: 110 lb/ac + 30 lb/ac fertigation

Previous Crop: Potatoes

Date Harvested: August 31

Seed Rate: 120 lbs/acre

Row Spacing: 8-inch

Plot Size: 6 ft. x 35'; 9 rows planted 8 nches

Comments:

Vegetative growth this year was poor starting from early tillering; plants were stunted and tillered poorly. Soil samples revealed high levels of Cereal Cyst Nematode (3661/250 g soil). This level of CCN would cause 70% yield loss in spring wheat in Oregon.

Field trial results likely reflects tolerance by certain cultivars, some varieties had excellent growth whereas right beside them other varieties showed poor growth. Centennial and IDO563 are related lines and seem to do poorly when CCN is present. IDO 599 and IDO 632 are related and did very well with CCN present. It seems that this data must be interpreted as results with CCN present.

Weed control was good. The result of this field trial was fair yields, averaging 111 bu/acre. This was a good trial statistically; finding yield differences between varieties; the LSD (10%) was 10.9 bu/ac.

Wet, humid and cool conditions caused some Xanthomonas (bacterial) leaf blight again this year. However, bushel weights were very good, averaging 59.9 lbs/bu.

Table 2. 2005-2007 (3-year Averages), Soft White Wheat Variety Performance Trial at Center.

Variety	Grain Yield ³	Bushel Weight	Heading Date ⁴	Plant Height ⁵	Grain Protein
	bu/ac	lbs/bu	(June)	in.	%
IDO599	150.9	60.4	23.5	37.5	9.7
Alturas	142.1	61.3	26.0	35.4	9.6
IDO563	120.1	60.7	20.8	34.2	10.1
IDO630w	124.3	60.0	27.0	34.2	9.9
Centennial	117.8	61.7	23.5	32.1	10.1
Trial Average	132.7	60.6	24.3	34.9	10.0

¹ San Luis Valley Research Center, Center, CO.

³ Grain yield based on 60 lbs/bushel and 12 % moisture.

⁴ Days after June 1.

⁵ Only two years average for plant height.

Comments: 2006 & 2007 trials were impacted greatly by heavy infestation of Cereal Cyst Nematode which likely affects some varieties more severely, such as Centennial and IDO630w. Centennial is still the choice variety, in my opinion. It yields well, is early maturing, stands well with less lodging than other varieties.

Table 4. 2007 Irrigated Spring Barley Variety Performance Trial at Center¹.

By Merlin A. Dillon, Area Extension Agent, Agronomy.

Variety	Source	Grain Yield ²	Bushel Weight	Heading Date ⁴	Grain Moisture	Plant Height	Grain Protein	Grain Color	Grain ⁵ Screen
		bu/ac	lbs/bu	(June)	%	(In.)	%	%	%
Ab 11720	ARS-Idaho	155.5a ³	52.5	30.0	12.0	32.1	9.8	39.6	2.2
01ST 1758	ARS-Idaho	148.3ab	51.6	29.0	12.8	29.1	10.5	39.1	1.9
Alexis	ARS-Idaho	146.0ab	51.7	32.8	15.4	30.3	11.0	41.7	2.6
Ab 11993	ARS-Idaho	146.0ab	50.7	27.8	14.2	32.7	10.5	39.5	1.2
C84	Coors Brewing	143.5abc	50.0	30.0	12.2	28.5	11.5	39.6	2.2
Baronesse	ARS-Idaho	141.8abcd	51.3	29.3	11.5	29.7	9.7	36.7	2.0
C106	Coors Brewing	139.0abcde	50.3	30.3	12.8	28.5	11.0	36.2	2.0
Scarlet	Rio Grande Co	134.2 bcdefg	49.9	29.8	12.4	34.2	10.8	43.2	1.5
Ab13449	ARS-Idaho	134.1 bcdefg	48.5	22.0	13.4	31.5	10.3	38.2	6.3
Eslick	Montana St. U	133.8 bcdefg	51.7	31.3	14.1	32.1	11.3	42.6	2.9
Legacy	Cargill	129.3 cdefg	48.6	26.0	12.8	34.5	11.3	41.1	2.7
Copeland	Cargill	124.4 efghij	49.8	31.5	14.1	34.2	11.0	44.2	1.6
C 69	Coors Brewing	124.2 efghij	49.9	33.3	12.5	27.6	10.4	40.2	1.9
C 99	Coors Brewing	122.5 fghijk	47.0	36.8	29.1	28.5	10.1	35.3	6.8
Craft	Montana St U	118.9 ghijk	50.6	25.8	11.6	30.6	11.1	42.6	2.3
Clearwater	ARS-Idaho	112.7 hijkl	52.4	28.8	13.6	32.4	12.5	41.1	9.8
Herald	ARS-Idaho	110.0 ijkl	46.2	28.0	13.4	33.0	11.0	38.6	3.6
Mt960101	Montana St. U	108.3 jkl	50.6	32.0	17.1	29.4	11.6	41.9	2.8
Burton	ARS-Idaho	107.1 kl	50.7	32.5	12.9	29.4	10.4	40.7	1.6
Haxby	Montana St. U	100.9 l	50.0	32.8	13.8	27.6	10.9	39.9	3.9
Trial Average		130.2	50.4	29.9	13.8	30.4	10.9	39.9	3.2
LSD, ₁₀⁶		16.3	1.16	4.32	2.81	1.67	NS	1.4	1.7
CV, %		10.6	2.0	12.3	17.3	4.7	7.8	2.9	45

¹ Trial conducted at the San Luis Valley Research Center, 0249 E Road 9 North, Center, CO.² Yield based on 48 lbs/bu and 12% moisture.³ Yields followed by the same letter (Tukey's Test) are in the same statistical yield group.⁴ Days after June 1.⁵ Grain screenings: the percent that falls through 6/64 inch screen.⁶ Means must differ more than LSD or one is likely not superior.

Important Note: Crop growth was affected by a residual soil problem; now determined to be from a heavy infestation of Cereal Cyst Nematode. Trial variability was high like last year and for the same reason. Some varieties may have more tolerance to CCN. Cultivars with less tolerance would perform relatively poorly in this trial.

Site Information:**Soil Type:** Norte gravelly sandy loam**Irrigation:** center pivot irrigation = ET.**Planted:** April 16**Previous Crop:** potatoes**Herbicide:** Bronate at 1 pt/acre**Harvest:** August 28**Fertilizer:** Nitrogen; 95 #/ac dry preplant + 30 #/ac fertigation**Comments:**

** Cargill Malt entered 5 unknown varieties in this trial; results are not shown in public information.

** Grain yields were fairly good, ranging from 101- 156 bu/acre; the average yield was 130 bu/acre. Yields were similar and statistical precision was about as good as last year; indicated by the CV = 10.6 %. LSD at 10% was 16.3 bu/acre.

** Weed control was good this year.

** Color readings are shown as measured; but may be skewed by maturity. Early maturing varieties stayed in the field longer after maturity. Data may be of some interest anyway. Many rains and showers and heavy dew reduced color again this year; it ranged from 35-42 and averaged only 40, same as last year but lower than the 68 two years ago.

** Heading dates were late because planting was late again this year; heading dates were similar to last year, from June 22 - July 3.

** Plant height varied from 28 - 34 inches; fewer tall entries this year.

** Lodging was low again this year; higher nitrogen rates would have increased plant lodging and impacted yield of some taller entries.

** Protein was low ranging from 9.7 - 12.5%.

** Screening % was very low for most entries; however, a few entries were up to 10%.

Variety Performance:

Only 9 varieties made up the top yield group this year with a top yield almost as high as last year. The top yield was 156 bu/acre and the average of all varieties was 130 bu/acre. Varieties that have yielded very well in both 2006 and 2007 include: Ab11720, 01ST1758, and AB 11993 with Ab13449, Eslick and Legacy performing almost as well both years.

Table 5. 2005-2007 (2-3 year Averages), Malt Barley Variety Performance Trial at Center¹.

Variety	Grain Yield ²		Bushel Weight ³	Heading Date ⁴
	2 yr	3 yr		
Ab 11720	161.3	--	52.7	28.5
Ab 11993	156.3	150.0	51.5	27.4
01ST1758	148.3	152.8	51.6	27.8
Eslick	142.8	150.7	51.8	27.6
Ab 13449	140.7	151.4	51.5	20.9
Legacy	139.2	--	49.2	24.2
C 84	138.3	--	50.6	30.4
Mt960101	129.9	138.7	51.5	30.8
C 69	128.8	138.3	49.9	32.9
Craft	128.1	--	51.6	25.7
Haxby	120.6	127.0	51.4	27.8
Burton	116.5	125.5	51.5	31.2
Trial Average	133.5	161.7	50.8	24.3

¹ San Luis Valley Research Center, Center, CO.

² Grain yield based on 60 lbs/bushel and 12 % moisture.

³ 2 yr average

⁴ Days after June 1, 2 yr average.

Comments:

2006 & 2007 trials were impacted by heavy infestation of Cereal Cyst Nematode which likely affects some varieties more than others.

Several experimental lines have performed very well. Ab lines are from USDA-ARS in Aberdeen, Idaho. 01ST1758 is interesting because it has resistance to Russian Wheat Aphid damage.

Table 10. The Effect of at planting and at heading Nitrogen Application on C69 Malt Barley, 2007, Center¹, CO. By Merlin A. Dillon, Area Extension Agronomist.

Nitrogen Treatment ⁵	Grain Yield ²	Grain Moisture	Grain Protein	Grain Color	Grain Screenings ⁴
(lbs N/acre)	bu/ac	%	%	--	%
At Planting Nitrogen					
80	144.9 a ³	10.0 a	11.1 a	38.7 a	2.0 a
120	170.8 b	10.6 a	12.1 b	38.8 a	2.7 b
At Heading Nitrogen					
0	154.9 a	10.0 a	10.8 a	38.4 a	2.2 a
30	157.5 a	10.2 ab	11.5 b	39.0 a	2.2 a
45	159.8 a	10.2 b	11.7 b	38.5 a	2.5 a
60	158.9 a	10.8 b	12.5 c	39.1 a	2.7 a
Trial Average	157.8	10.3	11.6	38.8	2.4

¹ Trial conducted at the San Luis Valley Research Center, 0249 E Road 9 North, Center, CO.

² Yield based on 48 lbs/bu and 12% moisture.

³ Yields or other characteristics followed by the same letter (Tukey's Test) are in the same statistical yield group.

⁴ Grain screenings: the percent that falls through 6/64 inch screen.

⁵ Nitrogen rate (lbs/acre) applied shortly after planting or at heading.

Important Note: Although yields were good in this trial, crop growth was affected by a residual soil problem; now determined to be from a heavy infestation of Cereal Cyst Nematode. Trial variability was likely due to CCN.

Site Information:

Soil Type: Norte gravelly sandy loam

Irrigation: center pivot irrigation = ET.

Planted: April 16

Previous Crop: potatoes

Herbicide: Bronate at 1.6 pt/acre

Harvest: August 28

Nitrogen Applied: 30 lbs/ac sprinkler + treatments shown

Comments:

The primary goal of this trial was to determine whether nitrogen applied at heading would increase grain protein of C69, Coors malt barley. Extra N at heading had no effect on grain yield, but increased grain protein, as expected. Protein increased from 10.8% with 0 nitrogen; 11.5% with 30 N; 11.7% with 45 N; and 12.5 % protein with 60 lbs N/acre at heading (p= .01). However, zero nitrogen had 10.8% protein; adequate protein for Coors premium level.

Nitrogen at planting improved both grain yield and protein. Yield increased from 145 to 171 bu/ac (p=.04). Protein increased from 11.1 to 12.1%; statistically significant at 0.03.

Nitrogen applied at planting had no effect on grain moisture. Higher N applied at heading increased grain moisture slightly, from 10.0 to 10.8%. Higher heading N rate tended to increase grain color, probably from delayed maturity. At planting N increased screenings, from 2.0 to 2.7%. At heading N tended to increase barley screenings (not statistically significant).

Table 10. The Effect of Late Season (heading) Nitrogen Application on C69 Malt Barley Protein, 2007, Center¹, CO. By Merlin A. Dillon, Area Extension Agronomist.

Nitrogen Treatment ⁵	Grain Yield ²	Grain Moisture	Grain Protein	Grain Color	Grain Screenings ⁴
(lbs N/acre) <u>At Planting Nitrogen</u>	bu/ac	%	%	--	%
80	161.8 a ³	10.3 a	11.8 a	38.8 a	2.3 a
120	153.8 a	10.3 a	11.5 a	38.8 a	2.5 a
<u>At Heading Nitrogen</u>					
0	154.9 a	10.2 a	10.8 a	38.4 a	2.2 a
30	157.5 a	10.2 ab	11.5 b	39.0 a	2.2 a
45	159.8 a	10.2 ab	11.7 b	38.5 a	2.5 a
60	158.9 a	10.8 b	12.5 c	39.1 a	2.7 a
Trial Average	157.8	10.3	11.6	38.8	2.4

¹ Trial conducted at the San Luis Valley Research Center, 0249 E Road 9 North, Center, CO.

² Yield based on 48 lbs/bu and 12% moisture.

³ Yields or other characteristics followed by the same letter (Tukey's Test) are in the same statistical yield group.

⁴ Grain screenings: the percent that falls through 6/64 inch screen.

⁵ Nitrogen rate (lbs/acre) applied shortly after planting or at heading.

Important Note: Crop growth was affected by a residual soil problem; now determined to be from a heavy infestation of Cereal Cyst Nematode. Trial variability was likely due to CCN.

Site Information:

Soil Type: Norte gravelly sandy loam

Irrigation: center pivot irrigation = ET.

Planted: April 16

Previous Crop: potatoes

Herbicide: Bronate at 1 pt/acre

Harvest: August 28

Comments:

The primary goal of this trial was to determine whether nitrogen applied at heading would increase grain protein of C69, Coors malt barley. Nitrogen rates applied at planting had no effect on yield or protein %. Nitrogen applied at heading (60 lbs/ac) increased grain protein from 10.0 to 10.8%. This was statistically significant at 0.01; this means that the same response would be likely if the experiment were repeated.

Nitrogen applied at planting had no effect on grain moisture. Higher N applied at heading increased grain moisture slightly, from 10.0 to 10.8%. Higher heading N rate tended to increase grain color, probably from delayed maturity. At heading N tended to increase screenings (not significant).

The following interaction was statistically significant, (15%).

Malting Barley protein % as affected by at planting nitrogen and at heading nitrogen, lbs N/acre.

At Planting Nitrogen	Nitrogen Rate Applied At Heading			
	0	30	45	60
80	10.9	11.8	12.1	12.3
120	10.6	11.2	11.3	12.8

**Table 8. Oat Variety Performance Trial in 2007, SLV Research Center.
By Merlin A. Dillon, Area Extension Agronomist.**

Variety	Grain Yield ²	Bushel Weight	Heading Date	Plant Height	Plant Lodging	Grain Moisture
	bu/ac	lbs/bu	(June)	in.	%	%
Maverick	163.8 a	38.7	34.5	47.7	1.3	20.5
Ab 10971	163.5 a	42.4	34.8	47.7	0.0	16.4
Ab 12770	161.9 a	38.1	34.5	49.5	10.0	18.0
Monida	150.7 a	36.0	34.8	51.9	35.0	18.8
Ab 11136	134.0 b	33.8	38.0	48.9	0.0	30.3
Monico	128.6 bc	39.2	30.0	50.7	0.0	23.3
Ab 8081	115.8 c	38.3	34.5	49.8	0.0	25.3
Trial Avg.	145.5	38.0	34.4	49.5	6.6	21.8
LSD, 10%	15.7	1.1	1.1	1.9	19.3	3.8
CV, %	14.0	2.5	2.6	3.0	239	14.3

¹ Trial conducted at SLV Research Center, 0249 E Road 9 North, Center, CO

² Tukey's Test; yields followed by the same letter are not statistically different.

³ Yield based on 38 lbs/bu and 12% moisture.

⁴ Date 50% of the plants headed; days after June 1.

Site Information:

Date Planted: April 11

Date Harvested: August 27

Irrigation: center pivot

Seed Rate: 90 lbs/ac

Herbicide: Bronate @ 1 pt/ac

Nitrogen: 65 lbs/acre preplant + 30 lb/ac sprinkler

Comments: This trial yielded better than last year, improving from 125 bu/ac to 146 bu/ac. It too was affected by the severe infestation of Cereal Cyst Nematode which reduced tillering and yield. Four varieties comprised the top yield group including Maverick, Ab10971, Ab12770 & Monida. Ab11136 & Ab12770. For the past two years, Maverick has topped the trial and Maverick, Monida and Ab12770 have been in the top yield group both years. Monico performed poorly in comparison. Maverick outyielded Monida slightly both years.

The bushel weights were fairly low this year, averaging 38 lbs/bu. Ab12770 had the highest bushel weight with 42.4 lbs/bu and Ab11136 was lowest at 33.8 lbs/bu. Monico headed earliest on June 30 and Ab11136 headed latest on July 8. Monida and Monico were the tallest varieties. Monida also had the most lodging, 35%, but Monico was among the varieties that had zero lodging. All varieties were high moisture at harvest, averaging 21.8%. Ab11136 had the highest moisture with 30.3%.

Oat Forage Trial

The same oat varieties plus triticale 2700 and oats Everleaf 126 were compared in an adjacent randomized, replicated forage trial. The results are weird because they were not harvested until after most oat varieties had already produced grain. Higher dry matter % indicates more maturity and more grain. Results were Maverick 6.6 a² tons/ac at 24.6% dry matter; Triticale 2700 6.2 ab T/ac at 36% DM; Monida 5.8 bc T/ac at 24.8% DM; Everleaf 126 at 5.7 bc T/ac at only 20.8% DM; and Monico 5.4 c T/ac at 27.3% DM. The dry matter percent indicates that Monico was early maturing (more grain), triticale 2700 was high grain at 36% dry matter, most oat varieties were around 24% dry matter and then Everleaf 126 was still immature with only 20.8% dry matter. Combining this data means that most oat varieties would have made around 4 tons/acre at normal hay maturity but that Everleaf 126 actually made 5.7 tons/acre since it was harvested at its proper hay maturity.

Table 9. Sunflower Variety Trial, 2007. Randomized, replicated On-Farm trial located on John Haws Farm, 2 West on Rio Grande County Road 9 N. Merlin Dillon, Area Extension Agent, Agronomy, San Luis Valley Research Center, Center, CO. **This trial was planned as a limited irrigation trial.**

Variety	Grain Yield ^{1/}	Bushel Weight	Oil Content
	lbs/ac	lbs/bu	%
NuSun 521	1154 a	25.3	38.0
NuSun 4651	1104 ab	21.7	35.4
NuSun 454	901 ab	24.0	37.0
Goliath	809 ab	18.8	--
TriumphS672	804 ab	23.6	37.9
TriumphTRX7449	797 ab	23.6	36.3
TriumphTRX3244	729 ab	22.2	38.3
Triumph 82OHO	647 b	26.8	41.6
Trial Average	868	23.3	37.8
LSD, .15	285	1.3	--
CV %	31.1	4.7	--

¹ Yield corrected for moisture; dry matter per acre. Yields followed by the same letter (Tukey's Test) are in the same statistical yield group.

Site Information:

Trial Location: Rio Grande County Roads 6N & 4E, John Haws Farm.

Previous Crop: canola

Date Planted: May 31

Irrigation: center pivot

Herbicide: Poast

Nitrogen: __70_lbs/acre

Date Harvested: October 19

Seed Rate: 17,000 seeds/acre

Row Spacing: 8-inch

Plot Size: 3 rows. x 35ft; 9 rows planted 8 inches apart

Irrigation: 6.65 in

Inseason rainfall: 2.95 in.

Total: 9.60 inches

Comments:

Sunflowers were grown in a 3 acre wedge shaped area under center pivot in Rio Grande County. Severe weed infestation and very limited irrigation hampered growth and plant development. Limiting irrigation was on purpose; to produce sunflowers with very little irrigation water. This is the niche where sunflower production could best fit under SLV growing conditions. The trial averaged 868 lbs/ac which is acceptable. An area of the field near the test plot area was harvested with the plot combine; yield there was 2000 lbs/acre. Another local grower produced sunflowers on 60 acres; 2 of the pivot. He chose sunflower because his water was limited; yet produced 2200 lbs/acre this year.