San Luis Valley Alfalfa Variety Trial at Center

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The 2002-2004 results of Colorado State University's alfalfa variety performance trial at Center are presented here. Plots were planted in June 2000 and the 2004 data are the third full year of the three-year testing period. Since only two harvests were taken in 2001, this data is not reported. Three full years data include 2002-2004. Results for 2004 are presented in Table 1; results for 2002-2004 are presented in Table 2. Alfalfa stands were excellent with few weeds throughout the testing period. The plots were in a cooperator's field two miles from the Research Center. It was center pivot irrigated.

Summer 2002 was hot and dry which made for good haymaking conditions. The entire summer was dry because of drought and with few showers, there was hardly any rain damage. First cutting was early, second cutting was not rained on, and third cutting was larger than normal because of the warm season. Yields were exceptionally high, averaging 7.0 tons per acre. Twelve varieties produced high yields in 2002 (Table 2).

Summer 2003 was not quite as warm and dry as 2002. First cutting was early, second cutting had some showers and third cutting yield was less than 2002. Twenty four varieties averaged 5.7 tons per acre (Table 2). The third harvest yield differences showed significant differences; however, 2003 total yield differences were not different.

Summer 2004 started warmer than normal and first cutting was earlier than normal. Summer 2004 was much cooler than the previous two years. Cooler weather reduced the third cutting yield and total yield compared to the previous two years (Table 1). The average yield was 5.5 tons per acre. Eight varieties produced high yields for harvest 1. Variety yield differences for harvest 2 were not significant. There were eight varieties which produced high yields for harvest 3. Note that the same varieties produced high yields for harvest 1, harvest 3, and total yield 2004. These varieties included DK 143, FG 3R139, Pro Gro, Baralfa 42IQ, Select, Pioneer 53V08, WL 325HQ, and Geneva.

Results averaged over several years is more useful, more important than single year results. The three-year average yields are shown in Table 2. Thirteen of 24 varieties produced high yields when averaged for all 3 years. These did not include the control varieties Vernal and Ranger. The high yield varieties included WL 327, DK 143, FG 3R139, Pro Gro, Baralfa 42IQ, Select, Pioneer 53V08, WL 325HQ, Magnum V, Geneva, Abound, DK 142, and Columbia 2000. The high yield varieties included newer, improved disease and insect resistant varieties already being grown by progressive growers in the San Luis Valley.

More information on situation and research methods follow the results tables.

Fig.1 A view of the alfalfa variety trial; some plots harvested, others remain to be harvested. Plot size = 8' x 16'.

Fig. 2. The John Deere 3430 crimper/swather with electronic weigh box added to weigh each individual plot.

Site Information:

Elevation = 7700 ft.
Average annual precipitation = 6.92 inches.
Average frost-free days = 88days (32^0 F).
Average last spring frost - June 10; average first fall frost - September 6.
Soil Series: Norte gravelly sandy loam.

Table 1. Alfalfa Variety Performance Trial Results, San Luis Valley[2/], 2004.

Variety	Source	Harvest 04			Total 2004	3 Year Average[1/]
		6/16	7/24	9/21		
		tons/acre[3]				
WL 327	WL Research	2.5	2.1	1.3	5.9	5.1 a
DK 143	DeKalb	2.6	2.2	1.2	6.0	5.1 a
FG 3R139	Forage Genetics	2.6	2.1	1.3	6.0	5.1 ab
Pro Gro	M.B.S., Inc.	2.4	2.1	1.2	5.7	5.1 ab
Baralfa 42IQ	Barenbrug	2.5	2.1	1.2	5.8	5.0 ab
Select	Forage Genetics	2.4	2.0	1.3	5.7	5.0 ab
53V08	Pioneer	2.3	2.2	1.2	5.7	5.0 ab
WL 325 HQ	WL Research	2.6	2.0	1.2	5.8	5.0 ab
Magnum V	Dairyland	2.3	2.1	1.2	5.6	5.0 ab
Geneva	Novartis	2.4	2.2	1.2	5.8	5.0 ab
Abound	Asgrow	2.3	2.1	1.2	5.6	4.9 ab
DK 142	DeKalb	2.3	2.0	1.2	5.5	4.9 ab
Columbia 2000	Public	2.3	2.0	1.1	5.5	4.9 ab
Award	Asgrow	2.3	2.1	1.1	5.5	4.8 ab
Ranger	USDA-NE AES	2.1	2.2	0.9	5.2	4.8 ab
Aspire	Asgrow	2.3	2.0	1.1	5.4	4.7 ab
DK 134	DeKalb	2.3	2.0	1.1	5.4	4.7 ab
FG 4200	Forage Genetics	2.3	1.9	1.2	5.5	4.7 ab
54Q53	Pioneer	2.3	1.9	1.2	5.4	4.7 ab
WL 232 HQ	WL Research	2.2	2.0	1.1	5.3	4.7 ab
HybriForce™ 400	Dairyland	2.1	1.9	1.1	5.1	4.6 ab
AmeriStand 201	ABI Alfalfa	2.3	2.0	1.0	5.3	4.6 ab
Gold Plus	M.B.S., Inc.	2.4	1.8	1.1	5.2	4.5 b
Vernal	USDA-WI AES	2.1	2.0	0.8	4.9	4.5 b
Average		2.34	2.05	1.14	5.53	4.85
CV (%)		8.3	10.1	10.5	6.7	5.0
LSD (0 .10)		0.23	N.S.	0.14	0.44	0.29

[1/] Tukey's Test: Yields followed by the same letter are not statistically different.

[2/] Trial conducted on the Sherrel Mix farm, Rio Grande County Roads 8N & 1W; seeded at 16 lbs/acre on 6/16/2000.

[3/] Yields calculated on oven-dry basis.

Table 2. Three Year Alfalfa Variety Performance Trial Results, San Luis Valley[2/], 2002-2004.

Variety	Source	2002	2003	2004	3 Year Average[1/]
		----------tons/acre[3]----------			
WL 327	WL Research	7.4	5.9	5.9	**5.1 a**
DK 143	DeKalb	7.1	6.0	6.0	**5.1 a**
FG 3R139	Forage Genetics	7.2	5.9	6.0	**5.1 ab**
Pro Gro	M.B.S., Inc.	7.3	5.6	5.7	**5.1 ab**
Baralfa 42IQ	Barenbrug	7.1	5.8	5.8	**5.0 ab**
Select	Forage Genetics	7.3	5.9	5.7	**5.0 ab**
53V08	Pioneer	7.1	5.8	5.7	**5.0 ab**
WL 325 HQ	WL Research	7.2	5.8	5.8	**5.0 ab**
Magnum V	Dairyland	7.2	6.1	5.6	**5.0 ab**
Geneva	Novartis	7.0	5.9	5.8	**5.0 ab**
Abound	Asgrow	7.1	5.8	5.6	**4.9 ab**
DK 142	DeKalb	7.1	5.8	5.5	**4.9 ab**
Columbia 2000	Public	7.1	5.7	5.5	**4.9 ab**
Award	Asgrow	6.7	5.5	5.5	**4.8 ab**
Ranger	USDA-NE AES	6.9	5.5	5.2	**4.8 ab**
Aspire	Asgrow	6.8	5.5	5.4	**4.7 ab**
DK 134	DeKalb	6.9	5.5	5.4	**4.7 ab**
FG 4200	Forage Genetics	6.8	5.5	5.5	**4.7 ab**
54Q53	Pioneer	6.8	5.7	5.4	**4.7 ab**
WL 232 HQ	WL Research	6.9	5.5	5.3	**4.7 ab**
HybriForce™-400	Dairyland	6.8	5.6	5.1	**4.6 ab**
AmeriStand 201	ABI Alfalfa	6.5	5.1	5.3	**4.6 ab**
Gold Plus	M.B.S., Inc.	6.5	5.0	5.2	**4.5 b**
Vernal	USDA-WI AES	6.6	5.6	4.9	**4.5 b**
Average		**7.0**	**5.67**	**5.53**	**4.85**
CV (%)		**4.6**	**8.3**	**6.7**	**5.0**
LSD (0 .10)		**0.38**	**N.S.**	**0.44**	**0.29**

[1/] Tukey's Test: Yields followed by the same letter are not statistically different.

[2/] Trial conducted on the Sherrel Mix farm, Rio Grande County Roads 8N & 1W; seeded at 16 lbs/acre on 6/16/2000.

[3/] Yields calculated on oven-dry basis.

Materials and Methods

This study includes 24 varieties planted in four replications in a randomized complete block design. Appreciation is expressed for the cooperation of local grower Sherrel Mix, a potato/barley/alfalfa producer. The field location is 2.5 miles southwest of the SLV Research Center. The soil is the same as one on the Research Center, a Norte gravelly sandy loam, a soil typical of many soils in this area.

This trial was planted solo in June 2000; an excellent stand was established. Trouble with the planter resulted in four missing plots each year of the entire trial.

San Luis Valley Situation

The San Luis Valley is a huge, flat inter-mountain valley at 7700 feet elevation, surrounded by snow-capped mountains. Average annual precipitation is only 7 inches. The frost-free period averages June 10 to September 6 which is 88 days. Alfalfa is grown with irrigation water whose source is the melting snow. This area is comprised of Alamosa, Conejos, Costilla, Rio Grande, and Saguache counties. This area has been increasing its alfalfa yield, alfalfa price and acreage. It produced alfalfa on

167,000 acres in 2001; a hay crop worth a record $69 million. Drought has since reduced the acreage and yield of alfalfa. Including San Luis Valley with other high altitude acreage in Colorado, high valley alfalfa is grown on over 200,000 acres.

Growers typically cut three times per year. Except in years with unusually warm summers, the third cutting is usually immature. Stands typically last 5 to 7 years; however, warm, dry winters sometimes kill the stand prematurely. Winter-hardiness and persistence are important variety selection factors; as well as regrowth, yield and pest resistance. It is important to test new alfalfa varieties under local conditions

Irrigation water was a problem for many growers beginning in 2002. Ditches ran very little water that year, nearly the lowest year on record. Senior irrigation ditches ran more water in 2003. However, many wells had problems; producing less water, having too little pressure or pumping air. Some wells had no water. Adequate water and good growing conditions produced better than average yields in this test plot for all three years. There was an irrigation problem for this trial in second harvest of 2003; the alfalfa showed taller and shorter rings. This problem was corrected with new nozzles and the third cutting was not affected. Temperatures were cooler in 2004 which reduced late season growth. Third cutting and total yield was reduced compared to the previous two years. .