

Forage Yields of 20 Alfalfa Varieties at the Southwestern Colorado Research Center at Yellow Jacket in 2000-2004

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Summary

The alfalfa variety trial was planted in 2000 and evaluated over a four-year period. In the establishment year, a planting date of June 2 was too late to allow for more than one cutting. In 2001, the first full year, the alfalfa trial averaged 8.25 tons/acre. This relatively high yield may be attributed to the new stand and harvesting only one cutting the previous year. In 2002, the alfalfa was damaged by unusual cold spring temperatures. The first cutting yield of 1.65 tons/acre was below average. As a result, the total yield for [2002](#) was only 5.85 tons/acre. In [2003](#), the alfalfa variety trial averaged 6.14 tons/acre for three cuttings notwithstanding an army cutworm infestation and a late summer hailstorm. The combined 4-year total yield (2001, [2002](#), [2003](#), and 2004) for each alfalfa variety shows that the 12 highest yielding varieties were not statistically different. There were significant yield differences for each cutting and for each year except for the second cutting in 2001. Ranger, the check variety, was the lowest yielding variety in each year.

Introduction and Objectives

Alfalfa variety performance tests under local conditions provide growers with information to assist them in selecting varieties for their own farm. Variety tests also provide seed companies, seed dealers, and consultants with information to evaluate and recommend varieties.

In southwestern Colorado, alfalfa is the main crop in terms of acreage, production, and cash value. In 2001, 86,000 acres of alfalfa were harvested in the five counties of southwestern Colorado (Archuleta, Dolores, La Plata, Montezuma, and San Miguel). Approximately 85% of this acreage was irrigated. The majority of the irrigated areas are served by older water delivery systems. The Dolores Project, a pressurized irrigation system developed by the Bureau of Reclamation, supplies irrigation water to the Dove Creek/Yellow Jacket area and to the Ute Mountain Ute Indian Reservation. The average growing season is 120 to 160 days with annual precipitation of 16 inches. One-half of the precipitation is received as snow with June being the driest month. The major soil series is Wetherill clay loam with a water holding capacity of 1.8 to 2.0 inches/foot and soil organic matter content of 1%. The soils are generally low in phosphorus and high in potassium. The elevation where alfalfa is produced ranges from 5,500 ft. to over 7,000 ft.

Average irrigated alfalfa yields in 2001 ranged from 2.60 tons/acre in Archuleta County to 4.35 tons/acre for Montezuma County. The Dolores Project lands in the Dove Creek/Yellow Jacket area averaged 4.20 tons/acre in 2001.

There are usually three cuttings per year: June, late July, and September. Alfalfa varieties recommended have dormancy ratings of 3 to 5 in most areas. The primary insects and diseases in the area are pea aphids, thrips, crown and root rots, and alfalfa weevils in the lower elevation

areas. The interaction between stem nematodes and root and crown rots is receiving increased attention in the area.

The winters of 2001-02 and 2002-03 were extremely dry with below average snowpack in the mountains. The record low stream runoffs resulted in limited irrigation water supplies in southwestern Colorado. The dry soil moisture conditions going into the growing season and a shortage of irrigation water made it difficult for area growers to meet the water requirements of the alfalfa crop. Most growers had enough irrigation water for only one or two cuttings each year. The Southwestern Colorado Research Center was able to reallocate water from other crops to provide adequate water for the alfalfa variety trial during this period.

Alfalfa hay quality in southwestern Colorado is good to excellent due to dry weather and relatively few disease and insect problems. The older irrigated areas of southwestern Colorado produce alfalfa targeted either for their own livestock operations or for livestock operations in the Four Corners area. A significant market for alfalfa hay has been developed with members of the nearby Indian tribes. A majority of the alfalfa produced under the Dolores Project is marketed to dairies in the southwestern United States.

Materials and Methods

The alfalfa variety trial was planted on June 2, 2000. A randomized complete block design with four replications was used for the trial. The trial was seeded with a Kincaid cone planter at 20 lbs/acre. A Carter Forage Plot Harvester (sickle-bar) was used to harvest the plots. Pursuit herbicide was used in the seeding year to achieve a weed-free stand. A good to excellent alfalfa stand was obtained. Phosphate fertilizer (200 lbs P₂O₅/acre) was broadcast in 2001. Mustang Max insecticide was applied on April 11, 2003 to control a severe army cutworm infestation. A wheel-line irrigation system and sprinklers with a single nozzle (40 ft. spacing) was used to irrigate the variety trial. Wheel-line moves were 60 ft. initially. This spacing was modified in 2002 and a spreader nozzle was added to improve irrigation efficiency. Irrigation water applied per acre in 2001, 2002, 2003, and 2004 was 19.5, 30.0, 34.5, and 27.0 inches, respectively. Precipitation for 2001, 2002, 2003, and 2004 was 10.0, 8.5, 8.7, and 15 inches, respectively.

Results and Discussion

Only one cutting was made in the seeding year due to the late planting date. The results for 2000 are not included in this report due to high variability in the data caused by hot and dry conditions during the summer. The average yield for the initial cutting in 2000 was 1.71 tons/acre.

In 2001, the average yield for all three cuttings was 8.25 tons/acre. This relative high yield for the area may be due to the new stand and harvesting only one cutting during the establishment year. The results are shown in Table 1.

In [2002](#) the variety trial averaged 5.85 tons/acre with a first cutting average of 1.65 tons/acre (Table 2). The alfalfa trial was damaged by cold weather in April and early May. On April 21, the temperature dropped to 21.9 °F. The alfalfa never recovered from the freeze damage and the first cutting yields were well below average. The high variability (CV%) for the first and second

cuttings may be primarily due to lack of winter moisture, freeze damage, and poor uniformity of irrigation water application. To improve the irrigation water uniformity, the wheel-line moves were shortened to 40 ft. after the first cutting and a spreader nozzle was added for the third cutting. This practice was continued in 2003 and 2004.

Table 3 shows the 2003 and the 3-year combined yield totals. The varieties are ranked in descending order by total yield. In 2003, the average yield was 6.14 tons/acre. The high variability in the third cutting was due to a severe hailstorm on September 9. It is estimated that the third cutting yield was reduced by 50% due to leaf loss and broken stems.

In 2004 the variety trial averaged 6.81 tons/acre (Table 4).

The combined 4-year total yield (2001, 2002, 2003, and 2004) for each alfalfa variety shows that the 12 highest yielding varieties were not statistically different at the 0.30 significance level. There were significant differences for each cutting and total yields for each year except for the second cutting in 2001. Ranger, the check variety, was the lowest yielding variety in each year.

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References

Colorado Agricultural Statistics Service. 2003. Colorado agricultural statistics. Nat'l Agric. Statistics Service and Colorado Dep. of Agric., Lakewood, CO.

Table 4. Forage yields of 20 alfalfa varieties at Yellow Jacket in 2004.¹

		1st Cut	2nd Cut	3rd Cut	2004	4-Yr
Variety	Brand/Source	6/10/04	8/4/04	10/15/04	Total	Total
-----tons/acre ² -----						
ZG 9650A*	ABI Alfalfa	3.47	2.37	1.28	7.12	28.48
Millennia	IFA	3.37	2.37	1.36	7.12	28.31
Baralfa 54	Barenbrug USA	3.53	2.28	1.15	6.96	28.21
Forecast 1001	Dairyland Seed Co.	3.49	2.46	1.31	7.26	28.13
Magnum V	Dairyland Seed Co.	3.31	2.29	1.18	6.78	28.04
WL 327	Germain's Seed	3.20	2.36	1.35	6.91	28.03
Pro Gro	MBS Genetics	3.41	2.36	1.24	7.00	27.78
DK 134	DeKalb	3.26	2.30	1.28	6.84	27.75
Focus HSN	Arkansas Valley Seeds	3.31	2.27	1.24	6.83	27.63
Geneva	Novartis Seeds	3.52	2.42	1.40	7.33	27.55

DK 142	DeKalb	3.27	2.27	1.27	6.82	27.48
DK 143	DeKalb	3.49	2.28	1.25	7.01	27.47
Award	Asgrow Seed Co.	3.41	2.28	1.26	6.95	27.24
Archer II	America's Alfalfa	3.31	2.25	1.21	6.77	26.94
Aspire	Asgrow Seed Co.	3.12	2.19	1.31	6.63	26.90
AmeriGraze 401+Z	America's Alfalfa	3.21	2.31	1.31	6.83	26.22
ZX 9652*	ABI Alfalfa	3.07	2.24	1.19	6.50	25.99
Abound	Asgrow Seed Co.	3.28	2.24	1.20	6.73	25.83
WL 325HQ	Germain's Seed	3.18	2.11	1.08	6.37	25.69
Ranger	Public	2.88	1.89	0.68	5.45	21.27
Average		3.30	2.28	1.23	6.81	27.05
CV%		6.40	4.94	7.15	4.55	5.23
LSD _(0.30)		0.16	0.08	0.06	0.23	1.05

¹Trial conducted at the southwestern Colorado Research Center, seeded 2 June 2000.

²Yields were calculated on an oven-dry basis and adjusted to 12% moisture.

*Indicates experimental entry.