

SOUTH DAKOTA– Alfalfa Variety Trial – 2017 Season

Karla Hernandez, South Dakota State University-Extension

Alfalfa is an important crop for most ruminant nutrition and is critical for profitable dairy production. In 2017, South Dakota ranked second in the nation in alfalfa acreage, behind Montana with >2.6 million tons produced from ~1.5 million acres harvested (USDA-NASS, 2018). Variety selection is an important component of profitable alfalfa production. The following is a report on yields observed in an alfalfa variety trial being conducted at the SDSU Southeast Research Farm. This is the second year of a small plot study with 21 lines.

Methods

The plots were laid out in a randomized complete block design with four replications. Plot size is 4' x 25'. Plots were fertilized with 180 lbs/ac potash (KCl) April 6, 2017. Plots were end-trimmed to ~20' length and plot lengths recorded immediately before harvest. Whole plot yields were taken using a forage harvester (Model SMW-SCH-48; Swift Machine & Welding; Swift Current, Saskatchewan, Canada) at ~4-week intervals: May 22, June 19, July 20, and August 23, 2017. Subsamples of fresh material were weighed and dried at 140°F to determine percent moisture. All yield data are presented on a dry weight basis. Because of rainfall during the winter, alfalfa stands were damaged in a swale in the plot area. To track this, in late April the plots were visually rated for stand and vigor on a 0-10 scale; all plots rated <7 for either stand or vigor were excluded from the yield analysis for the rest of the year. Data was subjected to standard ANOVA. Where treatment effects were statistically significant ($P < 0.10$), the means were individually compared to the highest yielding line for that cutting and separated with an LSD test ($P < 0.10$) using SAS statistical software, taking into account missing points for each comparison.

Results

On December 25, 2016, there was a thaw and rainfall of 0.88" followed by freezing weather. This damaged the alfalfa stand in part of the trial area. Yield data for each cutting and total 2017 production, as well as 2016 total production, are shown in Table 1. Note that data from damaged plots (rated <7 for stand or vigor in April) were not included in 2017 analysis. Average yield over the season for these plots was 5.92 tons/ac on a dry matter (DM) basis, ranging from 4.61-7.29 tons/ac. As for precipitation, the season began with a wetter than average spring and went into a mild drought in July and early August. There was grasshopper pressure noted in the plots before the third cutting; however, they tended to leave the field after it was cut and no insecticides were applied. This trial will be maintained and further yield data collected in the 2018 growing season.

Table 1. Forage yield on a DM basis during the second year of growth (2017) for 21 lines of alfalfa evaluated at the SDSU Southeast Research Farm, Beresford, SD. Data are based on whole plot (4' x 20') yields in a replicated trial. Harvest dates were May 22, June 19, July 20, and August 23, 2017. Variety effects were statistically significant ($P < 0.10$) for second and third cuttings, and season total yield.

Line	Source	1 st Cut (ton/ac)	2 nd Cut (ton/ac)	3 rd Cut (ton/ac)	4 th Cut (ton/ac)	2017 Total (ton/ac)	2016 Total (ton/ac)
Leyenda	Legend Seeds	2.39	1.81a	1.51a	1.59	7.29a	2.38a
8420	Wilbur-Ellis	2.22	1.67a	1.48a	1.68	7.06a	2.56a
FSG 426	Farm Science Genetics	2.24	1.70a	1.54a	1.33	6.81a	2.24
143146	Dairyland Seed	2.38	1.48a	1.41a	1.51	6.78a	2.43a
GA-497 HD	Preferred Alfalfa Genetics	2.31	1.49a	1.37a	1.41	6.57a	2.40a
GA-409	Preferred Alfalfa Genetics	2.30	1.47a	1.32a	1.36	6.46a	2.42a
Mustang 420+	Mustang Seeds	2.28	1.55a	1.33a	1.31	6.46a	2.17
8450	Wilbur-Ellis	2.27	1.38a	1.24a	1.25	6.14a	2.30a
CW 054004	Mycogen	2.08	1.31	1.23a	1.37	5.99a	2.46a
144109	Dairyland Seed	2.33	1.28	1.08	1.25	5.93a	2.58a
Robin	Blue River Hybrids	2.29	1.30	1.13	1.09	5.81	2.28
143147	Dairyland Seed	2.23	1.20	1.13	1.18	5.74	2.08
Bobolink	Blue River Hybrids	2.16	1.19	1.12	1.26	5.74	2.29
FSG 415 BR	Farm Science Genetics	2.28	0.96	1.09	1.24	5.58	2.36a
8444R	Wilbur-Ellis	1.92	1.32	1.09	1.17	5.51	2.14
FSG 423ST	Farm Science Genetics	2.09	1.19	1.09	1.14	5.50	2.44a
Mustang 620 Aph 2	Mustang Seeds	2.10	1.20	1.00	1.08	5.38	1.95
144110	Dairyland Seed	2.09	1.14	0.94	1.05	5.21	2.36a
Roadrunner	Blue River Hybrids	2.04	1.18	0.98	1.01	5.20	2.09
DG 4210	Dyna-Gro	1.89	0.99	0.89	0.88	4.66	1.96
FSG 403LR	Farm Science Genetics	2.07	0.88	0.80	0.87	4.61	2.16
Means		2.18	1.32	1.18	1.24	5.92	2.29
P-value		NS	<0.05	<0.10	NS	<0.10	<0.05
CV (%)		10.5	21.9	24.1	24.4	17.2	10.5
LSD (0.10)		NS	0.44	0.39	NS	1.39	0.29

All means followed by the letter "a" are not statistically different ($P < 0.10$) from the highest yielding line for that column. A set of LSD values calculated with three replications, or for missing data, is shown at the bottom of the table.