

Alfalfa Variety Trial at the Southeast Research Farm – 2018 Season

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Introduction

Alfalfa is an important crop for most ruminant nutrition, and it is critical for profitable dairy production. South Dakota ranks fourth in the nation, behind California, Idaho, and Montana, in alfalfa production with approximately 1.5 million acres harvested in the state in 2017 (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 third 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' by 25'. Plots were end-trimmed to approximately 20' length and plot lengths recorded immediately before harvest and then whole plot yields were taken using a forage harvester (Model SMW-SCH-48; Swift Machine & Welding, Swift Current, Saskatchewan, Canada) at approximately 4 week intervals: 24 May, 27 June, 27 July, and 29 August, 2018. 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. 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.

Results

Yield data for each cutting and total 2018 production, as well as 2016 and 2017 production are shown in Table 1. Average yield over the season for these plots was 6.22 tons per acre on a dry matter basis, ranging from 5.50 to 8.01 ton/ac. Monthly weather data for the period of January through September, 2018, is shown in Table 2 (average temperature) and Table 3 (rainfall) at the end of this report. June was an exceptionally wet month with 8.1" of rainfall recorded at the research farm.

Please Note: Data in Table 1 reflects three years of yield data with the establishment year considered the first year.

Table 1. Forage yield on a dry matter basis during the third year of growth (2018 season) for 21 lines of alfalfa evaluated at the SDSU Southeast Research Farm, Beresford, SD. Data are based on whole plot (4' by 20') yields in a replicated trial. Harvest dates were 24 May, 27 June, 27 July, and 29 August, 2018. Variety effects were statistically significant ($P < 0.10$) for the third and fourth cuttings, and for the season total yield. Lines are sorted according to total yield for the 2018 season. The LSD values were calculated with three replications to allow for missing data and are shown at the bottom of the table.

Line		1 st Cut May 24	2 nd Cut June 27	3 rd Cut July 27	4 th Cut Aug. 29	2018 Total	2017 Total	2016 Total
Leyenda	Legend Seeds	2.45	2.20	2.00	1.37	8.01	7.29	2.38
8420	Wilbur Ellis Company	2.21	1.85	1.71	1.11	7.12	7.06	2.56
143146	Dairyland	2.29	1.91	1.62	1.21	7.02	6.78	2.43
GA-497 HD	Preferred Alfalfa Genetics	2.19	1.88	1.68	1.13	6.89	6.57	2.40
CW 054004	Mycogen	2.16	1.78	1.55	1.07	6.55	5.99	2.46
144109	Dairyland	2.27	1.67	1.45	1.01	6.40	5.93	2.58
GA-409	Preferred Alfalfa Genetics	2.16	1.69	1.48	1.03	6.37	6.46	2.42
FSG 426	Farm Science Genetics	2.16	1.72	1.40	1.00	6.27	6.81	2.24
8444R	Wilbur Ellis Company	2.13	1.69	1.47	1.00	6.25	5.51	2.14
FSG 423ST	Farm Science Genetics	2.18	1.68	1.38	0.96	6.19	5.50	2.44
8450	Wilbur Ellis Company	2.24	1.70	1.30	0.93	6.17	6.14	2.30
Mustang 420+	Mustang Seeds	2.05	1.69	1.42	1.00	6.16	6.46	2.17
Bobolink	Blue River Hybrids	2.12	1.51	1.39	1.00	6.01	5.74	2.29
143147	Dairyland	2.28	1.54	1.26	0.90	5.99	5.74	2.08
FSG 415 BR	Farm Science Genetics	2.17	1.54	1.27	0.96	5.95	5.58	2.36
144110	Dairyland	2.24	1.58	1.15	0.86	5.83	5.21	2.36
Mustang 620 Aph 2	Mustang Seeds	2.15	1.59	1.13	0.82	5.69	5.38	1.95
FSG 403LR	Farm Science Genetics	2.21	1.42	1.13	0.84	5.60	4.61	2.16
Robin	Blue River Hybrids	2.16	1.48	1.13	0.79	5.57	5.81	2.28
Roadrunner	Blue River Hybrids	2.09	1.42	1.24	0.81	5.56	5.20	2.09
DG 4210	Dyna-Gro	<u>2.10</u>	<u>1.44</u>	<u>1.16</u>	<u>0.80</u>	<u>5.50</u>	<u>4.66</u>	<u>1.96</u>
	<i>Mean</i>	<i>2.19</i>	<i>1.67</i>	<i>1.40</i>	<i>0.98</i>	<i>6.22</i>	<i>5.92</i>	<i>2.29</i>
	<i>CV (%)</i>	<i>6.6</i>	<i>17.4</i>	<i>21.8</i>	<i>20.5</i>	<i>14.1</i>	<i>17.2</i>	<i>10.5</i>
	<i>LSD (0.10)</i>	<i>NS</i>	<i>NS</i>	<i>0.41</i>	<i>0.27</i>	<i>1.19</i>	<i>1.39</i>	<i>0.29</i>

Table 1. Temperatures* at the Southeast Research Farm – 2018.

	2018 Average Air Temps. (°F)		66-year Average Air Temps. (°F)		Departure from 66-year Average (°F)	
	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum
January	25.8	4.2	27.0	5.8	+1.3	-1.6
February	24.4	2.2	32.2	11.1	-7.8	-8.9
March	41.7	25.9	44.2	23.0	-2.5	+3.5
April	47.1	25.9	60.0	35.1	-12.9	-9.2
May	76.0	53.3	72.0	47.4	+4.0	+5.9
June	82.7	63.6	81.5	57.8	+1.2	+5.8
July	83.6	62.3	86.0	62.1	-2.4	+0.2
August	80.2	59.6	83.9	59.4	-3.7	+0.2
September	74.8	55.3	75.6	49.3	-0.8	+6.0
October	NA	NA	NA	NA	NA	NA
November	NA	NA	NA	NA	NA	NA
December	NA	NA	NA	NA	NA	NA

* Computed from daily observations through September 30, 2018

Table 2. Precipitation at the Southeast Research Farm – 2018.

Month	Precipitation 2018 (inches)	66-year Average (inches)	Departure from Avg. (inches)
January	0.08	0.45	-0.37
February	0.55	0.80	-0.25
March	1.71	1.42	+0.29
April	1.55	2.55	-1.00
May	3.83	3.53	+0.30
June	8.12	4.21	+3.91
July	3.25	3.08	+0.17
August	3.59	3.07	+0.52
September	6.77	2.83	+3.94
October	NA	NA	NA
November	NA	NA	NA
December	NA	NA	NA
Totals (through Sept.)	29.45*	21.90*	+7.52*

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Weather data is compiled from daily observations collected by Southeast Farm Personnel in cooperation with South Dakota State Climatologist, South Dakota Office of Climatology and SDSU Extension, and the National Weather Service, Sioux Falls, SD. More climate information available at South Dakota State University – South Dakota Climate and Weather site: http://climate.sdstate.edu/climate_site/climate.htm.