

Trial Highlights

This is a collaborative study among three states (Wyoming, South Dakota, and Nebraska) in the Northern High Plains. The study included both irrigated and dryland trials in replicated plots. The data presented in this report is from Wyoming, the first year (2017) of forage sorghum hybrid testing at the University of Wyoming. Results from South Dakota and Nebraska can be found on their respective extension websites.

The Wyoming trial was conducted at the University of Wyoming James C. Hageman Sustainable Agriculture Research and Extension Center near Lingle. The plots of irrigated and dryland were established nearby areas to maintain similar soils (clay to sandy loam, pH 8.1-8.3, organic matter 2.2-2.9%) and growing conditions. The irrigated trial was planted on May 31, 2017 at a seeding rate of 80,000 pure live seeds (PLS) and the dryland trial was planted on June 1, 2017 at a seeding rate of 60,000 PLS. There were 22 hybrids for irrigated and 19 hybrids for dryland plots replicated three times. A corn silage as a check was included in both trials. Nitrogen (N) was applied based on soil test results (100 pounds N per acre): 56 pounds per acre for irrigated; no N was applied to dryland because of enough residual N. Harvest dates for each hybrid varied depending on maturity and weather conditions and are listed in Tables 1 and 2. These dates along with harvest moisture provide with an indication of relative maturity and suitability for this climate.

As with other two states, Wyoming was extremely dry in 2017 growing season (Figure 1) which affected plant growth (Figure 2) and dry matter production of both conditions. There were large variations among the used hybrids for dry matter production with a range of 2.1-11.8 tons per acre for irrigated and 2.3-7.5 tons per acre for dryland conditions. Overall as expected, on average, irrigated plots produced greater dry matter yields (5.1 tons per acre) compared to dryland plots (4.4 tons per acre) (Tables 1 and 2). The highest yields for irrigated and dryland were 11.8 (SP4555) and 7.5 (SP4555) tons per acre, respectively. Some hybrids performed well in both irrigated and dryland conditions. Majority of the hybrids produced greater dry matter than corn check in both conditions. Average plant height was similar for both conditions. Lodging was not a problem for all hybrids except a few (Tables 1 and 2).

Nutritive value of forage sorghum hybrids is summarized in Tables 3 and 4. Crude protein (CP) ranges from 8-13% and 8-16% in irrigated and dryland, respectively with no differences among hybrids. Similar acid detergent fiber (ADF), neutral detergent fiber (ADF), total digestible nutrients (TDN), and relative feed value (RFV) were observed among the hybrids for both irrigated and dryland conditions.

Acknowledgments: We thank Kevin Madden, Farm Manager and graduate students Dennis Ashilenje and Michael Baidoo for their help in planting, maintaining plots, and collecting data. We also thank all the seed companies that participated in the trials.

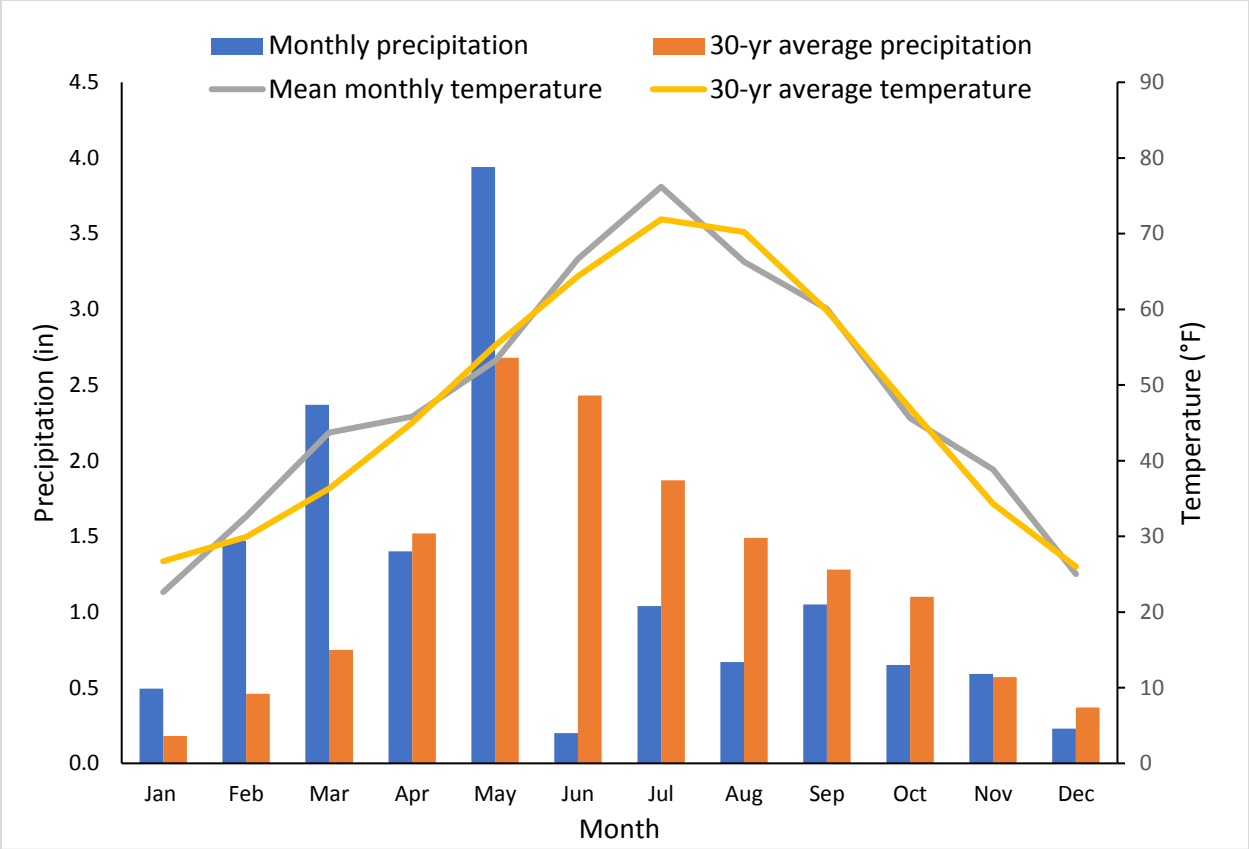


Figure 1. Monthly precipitation and mean temperature and 30-yr average at the James C. Hageman Sustainable Agriculture Research and Extension Center near Lingle, Wyoming in 2017.



Figure 2. Forage sorghum trial in dryland conditions at the James C. Hageman Sustainable Agriculture Research and Extension Center near Lingle, Wyoming in 2017.

Table 1. Plant height, lodging, dry matter yield, harvest date, and harvest moisture of forage sorghum under irrigated conditions in 2017 at the James C. Hageman Sustainable Agriculture Research and Extension Center near Lingle, Wyoming.

Hybrid	Plant height at harvest (inch)	Lodging (%)	Forage dry matter (tons/acre)	Date of harvest	Harvest moisture (%)
NK300	49.5	0	2.9	10/7/2017	70
SP2774	52.7	0	7.1	10/7/2017	66
SP4555	85.2	43	11.8	9/23/2017	68
SP4105	49.2	0	2.1	10/7/2017	78
NUTRI-CANE II	54.3	0	6.6	10/7/2017	74
SWEETLEAF II	91.3	0	5.9	10/7/2017	68
X5063	49.5	0	3.5	10/7/2017	67
X50712	61.1	0	3.7	10/7/2017	63
X50644	62.1	0	4.1	10/7/2017	71
X50610	41.4	0	3.6	10/7/2017	69
X51423	48.0	0	3.9	10/7/2017	66
X54243	62.7	0	3.1	10/7/2017	74
GW 600 BMR	62.3	0	4.2	10/7/2017	73
Silo Pro BD BMR	38.2	0	3.7	10/7/2017	68
GW 400 BMR	58.9	0	8.9	10/7/2017	66
GW 475 BMR	54.7	0	6.1	10/7/2017	62
GW 2120	53.8	0	5.1	10/7/2017	66
EXP 15F 1097 BMR	50.7	0	6.3	10/7/2017	68
EXP 15F909	56.1	0	3.7	10/7/2017	73
Sweet Forever BMR	57.8	0	5.9	10/7/2017	72
Nutri King BMR	74.6	0	5.3	10/7/2017	69
Super Sugar DM	56.4	0	5.2	10/7/2017	67
Corn Silage Control-A	87.1	7	4.8	9/23/2017	71
Mean	59.0	2.2	5.1		69.0
P value	<0.0001	<0.0001	<0.0001		0.32
LSD (0.05)	18.2	11	2.1		9.9

Table 2. Plant height, lodging, dry matter yield, harvest date, and harvest moisture of forage sorghum under dryland conditions in 2017 at the James C. Hageman Sustainable Agriculture Research and Extension Center near Lingle, Wyoming.

Hybrid	Plant height at harvest (inch)	Lodging (%)	Forage dry matter (tons/acre)	Date of harvest	Harvest moisture (%)
1st Choice BMR	66.5	0	5.4	9/23/2017	60
Honey Graze V	81.5	0	3.8	10/7/2017	77
Silo Mor II BMR	68.1	27	3.0	10/7/2017	77
NK300	47.2	0	6.0	9/23/2017	62
SP2774	68.9	0	3.2	10/7/2017	79
SP4555	83.6	0	7.5	9/9/2017	65
SP4105	51.0	0	2.3	10/7/2017	74
NUTRI-CANE II	56.7	0	3.6	10/7/2017	77
SWEETLEAF II	108.4	0	6.8	9/23/2017	54
GW 400 BMR	74.1	0	4.8	10/7/2017	75
GW 2120	66.0	0	4.3	10/7/2017	76
Sweet Forever BMR	72.8	0	4.0	10/7/2017	78
NutriKingBMR	88.4	67	6.8	9/9/2017	62
Super Sugar DM	68.1	0	4.3	10/7/2017	75
AF7101	77.6	0	4.2	10/7/2017	71
AF7102	54.3	0	2.5	10/7/2017	72
AS6402	49.9	0	5.1	10/7/2017	71
AS9302	62.2	0	2.7	10/7/2017	71
ADV6504	64.7	0	3.7	10/7/2017	83
Corn Silage Control-A	80.9	20	3.7	9/23/2017	62
Mean	69.5	6	4.4		71.1
<i>P</i> value	<0.0001	0.0003	0.0007		<.0001
LSD (0.05)	18.904	24	2.3		7.6

Table 3. Nutritive values of forage sorghum under irrigated conditions in 2017 at the James C. Hageman Sustainable Agriculture Research and Extension Center near Lingle, Wyoming.

Hybrid	Crude protein	Acid detergent fiber	Neutral detergent fiber	Total digestible nutrients	Relative feed value
	(%)				
NK300	9.7	33.7	56.3	64.3	104
SP2774	13.3	35.3	64.7	62.3	89
SP4555	11.0	39.0	59.0	58.3	93
SP4105	10.0	37.3	58.0	60.7	96
NUTRI-CANE II	9.7	35.3	59.0	62.7	97
SWEETLEAF II	10.0	38.7	62.0	58.3	88
X5063	11.0	33.3	57.7	64.7	102
X50712	10.3	35.0	57.7	63.0	100
X50644	10.7	39.3	59.3	58.0	92
X50610	11.0	37.0	59.3	60.7	94
X51423	10.7	32.3	53.0	66.0	112
X54243	11.0	37.0	64.3	60.0	87
GW 600 BMR	9.0	35.3	57.3	62.7	100
Silo Pro BD BMR	10.0	33.0	56.7	65.0	104
GW 400 BMR	10.3	34.7	56.3	63.0	102
GW 475 BMR	10.0	36.7	60.7	60.7	93
GW 2120	8.7	36.7	58.3	61.3	97
EXP 15F 1097 BMR	9.7	33.3	55.7	64.7	105
EXP 15F909	9.0	37.7	64.0	59.7	86
Sweet Forever BMR	8.3	33.7	56.7	64.7	104
Nutri King BMR	8.7	34.7	55.3	63.0	104
Super Sugar DM	9.0	36.7	58.7	60.7	97
Corn Silage Control-A	9.7	29.7	51.0	68.7	122
Mean	10.0	35.4	58.3	62.3	99
<i>P value</i>	0.727	0.011	0.010	0.005	0.012
LSD (0.05)	3.5	4.5	6.3	4.9	16

Table 4. Nutritive values of forage sorghum under dryland conditions in 2017 at the James C. Hageman Sustainable Agriculture Research and Extension Center near Lingle, Wyoming.

Hybrid	Crude protein	Acid detergent fiber	Neutral detergent fiber	Total digestible nutrients	Relative feed value
	(%)				
1st Choice BMR	15.7	30.7	54.0	67.7	112
Honey Graze V	8.3	35.0	55.0	62.7	104
Silo Mor II BMR	9.7	33.0	54.7	64.3	107
NK300	9.3	33.7	56.3	64.3	104
SP2774	9.0	35.0	55.7	62.7	103
SP4555	9.3	33.2	54.4	64.8	108
SP4105	13.0	33.0	55.0	65.0	107
NUTRI-CANE II	10.0	32.0	54.3	66.3	110
SWEETLEAF II	9.0	38.3	62.0	59.0	89
GW 400 BMR	9.7	31.7	50.3	66.0	118
GW 2120	8.3	30.7	52.3	67.7	116
Sweet Forever BMR	8.3	32.0	55.0	66.0	108
Nutri King BMR	10.5	30.3	48.1	68.0	128
Super Sugar DM	9.3	33.7	57.0	64.3	103
AF7101	9.0	33.0	57.0	65.0	103
AF7102	11.7	33.0	56.0	65.0	106
AS6402	12.7	33.3	60.3	64.7	97
AS9302	10.7	35.7	58.3	62.0	99
ADV6504	10.0	35.3	55.3	62.7	103
Corn Silage Control-A	9.3	30.7	53.0	68.0	115
Mean	10.1	33.2	55.2	64.8	107
<i>P value</i>	0.090	0.117	0.0002	0.099	0.003
LSD (0.05)	4.1	4.6	4.5	5.1	14