2017 South Dakota Forage Sorghum Trial Results

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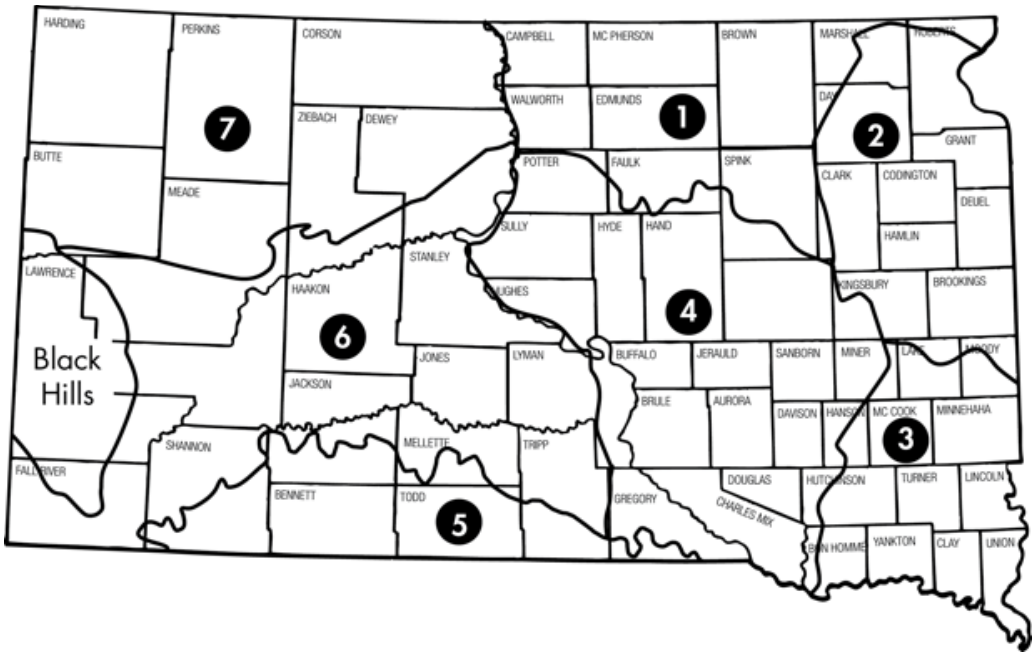
Crop Zones in South Dakota



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Trial Highlights

The 2017 growing season marks the first year of forage sorghum hybrid testing at South Dakota State University. This work is a collaborative effort to replicate both irrigated and dryland trials across three states: South Dakota, Nebraska and Wyoming. The data presented below is from South Dakota and you can find the Nebraska and Wyoming data on their respective extension websites.

The South Dakota trials were held in the west-central portion of the state near the town of Vale. The irrigated and dryland trials were conducted side-by-side to maintain similar soils (silt-loam, pH 6.5) and growing conditions. Both trials were planted on May 25th, 2017 at a seeding rate of 80,000 pls and 60,000 pls for the irrigated and dryland trials, respectively. Harvest dates for each hybrid varied depending on maturity and are listed in Table 1 and Table 2. These dates along with harvest moisture give a sense of relative maturity and suitability for this climate.

Drought persisted for much of the growing season. In particular, May was an extremely dry month, causing very dry planting conditions (Figure 1). However, of greater concern was a very high rainfall event along with softball-sized hail, which occurred during the second week of July. As a result, the trial was nearly destroyed (Figure 2). Surprisingly, both the irrigated and dryland trials came back quite strong, perhaps with help from the substantial amount of rainfall that fell with the hail. Unfortunately, our corn check did not recover because it was at a later growth stage.

In total, we tested 26 irrigated hybrids and 19 dryland hybrids, with many of the same hybrids in both trials. Yields in the irrigated trials averaged 17.1 tons/ac, while yields in the dryland trial average 10.9 tons/ac. For the irrigated trial, all hybrids yielding above 18.3 tons/ac were not statistically different than the highest yielding hybrid. In the dryland trial this yield was 10.2 tons/ac. Tables 3 and 4 show the chemical analyses for both trials. These tables provide quality indicators that can be used to supplement basic yield measurements. In general higher crude protein and lower acid detergent fiber (ADF) and neutral detergent fiber (NDF) indicate higher quality feed. While more appropriate for legume-based hay, the relative feed value (RFV) gives a sense of digestibility and intake potential. It is derived from ADF and NDF with a value of 100 being equivalent to alfalfa at full bloom.

Acknowledgments: We would like to extend a special thanks to Darryl, Doug and Kyle Cox for allowing us to put these trials on their land and for their generous help in maintaining the plots. Additionally, thanks to all of the seed companies that participated in the trials.

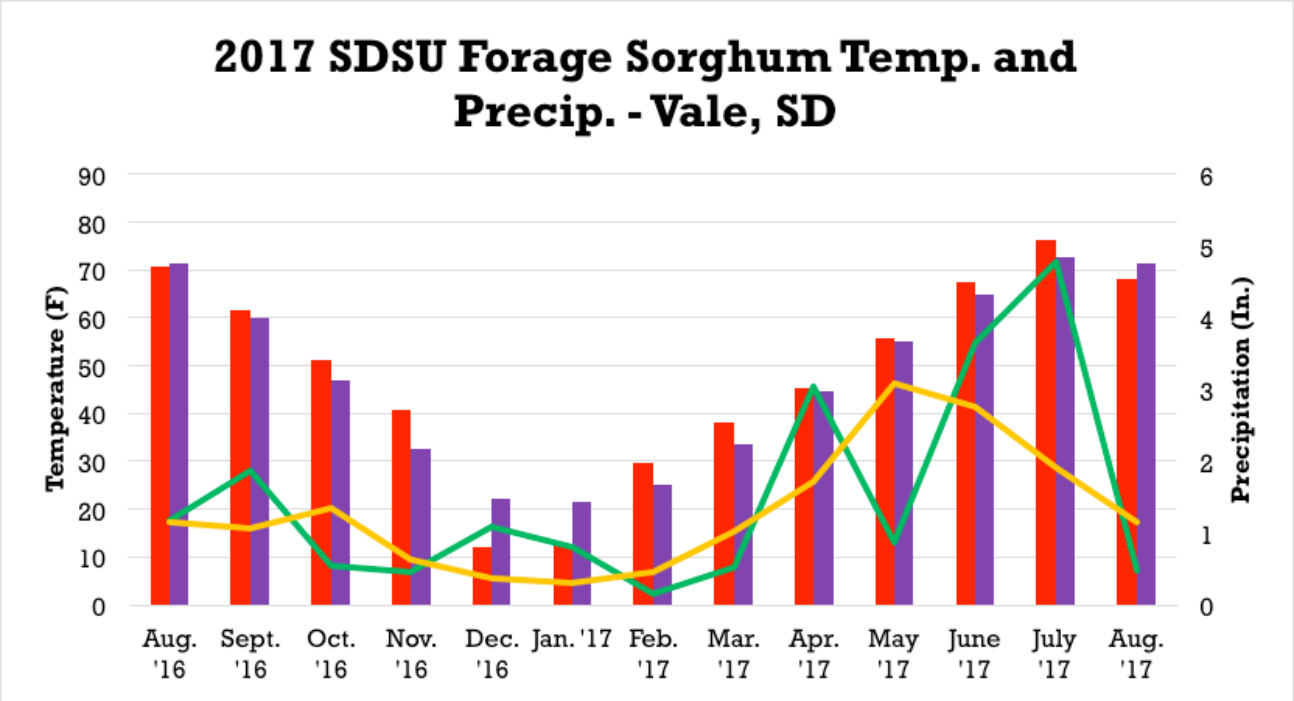

Figure 1. Temperature and precipitation for the 2017 forage sorghum trials. The bars represent the 2017 (red) and 30-yr temperature average (purple). The lines represent the 2017 (green) and 30-yr precipitation average.

Figure 2. Picture showing severe hail damage to forage sorghum crop. Picture taken July 25, 2017.

Table 1. Yield adjusted to 65% moisture, height, harvest date and biomass moisture at harvest in irrigated forage sorghum trial.

SD Irrigated Forage Sorghum Trial				
Hybrid	Yield @65%(tons/ac)	Height (in.)	Harvest Date	Harvest Moisture
NK300	12.4	65	9/27/17	82%
Silo Pro BD BMR	13.9	60	10/5/17	74%
X5063	16.4	82	10/5/17	79%
EXP 15F1097 BMR	13.5	79	10/5/17	81%
SP4105	15.4	85	10/5/17	79%
X50610	17.5	60	9/18/17	74%
NUTRI-CANE II	16.2	80	10/5/17	79%
Nighthawk 6	16.0	73	10/5/17	75%
BlackHawk 12	**20.1**	96	10/5/17	75%
GW 400 BMR	16.7	84	9/12/17	80%
Pelican BD 6	16.5	76	10/5/17	77%
Sweet Forever BMR	16.7	99	10/5/17	80%
X51423	15.5	78	9/27/17	81%
GW 600 BMR	15.2	87	9/27/17	79%
SP4555	**19.0**	93	10/5/17	81%
X50712	17.2	82	10/5/17	75%
SP2774	**19.5**	91	9/27/17	79%
X50644	16.1	93	9/27/17	81%
Nutri King BMR	**19.7**	93	9/27/17	80%
GW 475 BMR	15.0	87	10/5/17	77%
GW 2120	18.1	81	9/18/17	80%
EXP 15F909	16.6	94	9/27/17	74%
X54243	**20.3**	120	9/27/17	73%
SeaHawk 6	16.9	92	10/5/17	77%
Super Sugar DM	**21.6**	97	10/5/17	78%
SWEETLEAF II	**21.6**	113	10/5/17	73%
Average	17.1	86		78%
LSD†	3.3	-		-
TYG	18.3	-		-

† Yield, test weight or protein value required to determine if varieties are significantly different from one another with 95% confidence. Bolded values are not statistically different from the highest value

Table 2. Yield adjusted to 65% moisture, height, harvest date and biomass moisture at harvest in dryland forage sorghum trial.

SD Dryland Forage Sorghum Trial				
Hybrid	Yield @65%(tons/ac)	Height (in)	Harvest Date	Harvest Moisture
AF7101	6.6	44	9/27/17	79%
SP4555	8.4	62	9/12/17	77%
GW 400 BMR	8.8	65	9/27/17	81%
NK300	8.9	43	9/12/17	72%
AF7102	7.8	50	9/27/17	79%
Silo Mor II BMR	9.3	42	9/12/17	75%
GW 2120	7.7	46	9/18/17	73%
NUTRI-CANE II	**13.1**	61	9/18/17	74%
Sweet Forever BMR	**13.4**	77	9/18/17	78%
AS9302	**10.7**	61	9/7/17	73%
AS6504	**15.0**	71	9/27/17	80%
Nutri King BMR	**10.2**	70	9/18/17	82%
SP4105	10.1	58	9/12/17	80%
1st Choice BMR	7.0	65	9/27/17	76%
AS6402	**11.2**	57	9/7/17	75%
Super Sugar DM	**12.9**	77	10/3/17	75%
SP2774	**14.2**	75	9/27/17	76%
Honey Graze V	**15.5**	91	9/18/17	78%
SWEETLEAF II	**15.6**	85	10/3/17	70%
Average	10.9	63		77%
LSD	5.4	-		-
TYG	10.2	-		-

Table 3. Chemical quality parameters of forage sorghum hybrids in irrigated forage sorghum trial.

SD Irrigated Forage Sorghum Trial					
Hybrid	Crude Protein (%)	Acid Detergent Fiber (%)	Neutral Detergent Fiber (%)	Relative Feed Value	Total Digestable Nutrients (%)
NK300	9.2	**32.7**	66.8	88.7	**65.3**
Silo Pro BD BMR	**11.3**	**34.4**	**57.9**	**100.0**	**63.3**
X5063	9.6	37.8	**59.4**	**93.7**	59.4
EXP 15F1097 BMR	9.5	38.5	**60.9**	**90.0**	58.6
SP4105	**11.0**	38.9	**61.1**	89.3	58.2
X50610	**10.8**	38.9	63.0	86.7	58.2
NUTRI-CANE II	8.4	39.1	**60.5**	**90.0**	58.0
Nighthawk 6	**11.7**	39.1	**61.3**	88.7	58.0
BlackHawk 12	**10.6**	39.2	62.2	87.7	57.9
GW 400 BMR	9.3	39.2	**58.3**	**93.0**	57.8
Pelican BD 6	**11.6**	39.2	62.0	87.7	57.8
Sweet Forever BMR	8.8	39.4	62.5	86.3	57.7
X51423	**11.8**	39.4	**61.8**	88.3	57.7
GW 600 BMR	**11.3**	39.6	**61.0**	88.7	57.4
SP4555	**11.1**	39.6	**61.5**	87.7	57.3
X50712	8.1	40.1	**61.0**	89.3	56.9
SP2774	9.9	40.2	62.9	85.0	56.7
X50644	**10.9**	40.3	**61.5**	87.0	56.5
Nutri King BMR	**10.5**	40.5	**61.7**	86.3	56.3
GW 475 BMR	**10.2**	41.0	**61.9**	85.7	55.8
GW 2120	**10.0**	41.2	62.9	84.0	55.6
EXP 15F909	8.1	42.0	65.6	79.7	54.6
X54243	8.0	42.1	66.3	79.0	54.5
SeaHawk 6	9.7	42.5	63.7	81.7	54.1
Super Sugar DM	9.4	42.6	63.1	82.3	53.9
SWEETLEAF II	10.0	47.3	69.7	69.3	48.6
Average	10.0	39.8	62.3	86.8	57.2
LSD	1.7	3.7	4.2	10.0	4.2
TYG	10.0	36.4	62.1	90.0	61.1

Table 4. Chemical quality parameters of forage sorghum hybrids in dryland forage sorghum trial.

SD Dryland Forage Sorghum Trial					
Hybrid	Crude Protein (%)	Acid Detergent Fiber (%)	Neutral Detergent Fiber (%)	Relative Feed Value	Total Digestible Nutrients (%)
AF7101	**12.6**	**26.1**	**56.0**	**114.7**	**72.7**
SP4555	**13.0**	**27.1**	**56.9**	**113.3**	**71.7**
GW 400 BMR	9.7	**28.0**	**56.8**	**110.7**	**70.6**
NK300	**13.0**	**28.0**	**53.5**	**117.3**	**70.6**
AF7102	9.9	31.2	**59.2**	102.0	66.9
Silo Mor II BMR	**11.5**	32.0	**58.7**	101.3	66.1
GW 2120	10.7	32.1	**57.3**	**104.3**	65.9
NUTRI-CANE II	8.7	33.1	**58.0**	101.3	64.8
Sweet Forever BMR	10.0	33.4	**59.0**	99.3	64.5
AS9302	10.5	33.7	**59.1**	98.7	64.1
AS6504	**11.2**	34.2	**58.5**	99.7	63.6
Nutri King BMR	10.1	34.4	65.0	90.3	63.3
SP4105	**13.0**	35.1	60.6	94.7	62.5
1st Choice BMR	10.0	35.5	61.5	93.0	62.1
AS6402	10.7	35.6	61.5	92.7	62.0
Super Sugar DM	9.3	35.8	60.1	94.3	61.8
SP2774	10.0	36.2	60.4	94.3	61.3
Honey Graze V	9.8	37.9	62.5	89.0	59.3
SWEETLEAF II	9.4	41.2	66.8	79.3	55.5
Average	10.7	33.2	59.6	99.5	64.7
LSD	2.1	4.9	5.9	15.2	5.6
TYG	11.0	31.0	59.4	102.2	67.1