

# FORAGE SORGHUM VARIETY TRIALS 2014

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## Introduction

Forage sorghum and sweet sorghum (*Sorghum bicolor* L. Moench.) are an excellent source of supplemental forage in the summer and early-fall, especially in drought-stricken years or when many alfalfa pastures were winter-killed. Forage sorghum silage has about 88% of the feed value of corn silage, but it is much more drought tolerant than corn.

Also, forage sorghum is being looked at as a promising source of lignocellulosic feedstock for biofuels. Forage sorghum is the highest yielding annual feedstock for the second generation biofuel industry in the northern Great Plains.

## Materials and Methods

Experiments were planted in Fargo and Prosper, ND. Seeding dates were 4 June in Fargo and 24 May in Prosper. Plots were 1.5 by 6 m long with 4 rows separated 30 cm apart. Seeding rates varied according to the cultivar or hybrid. Recommended rates for each cultivar were used. Both experiments and at both locations were fertilized 80 lbs N/acre. Plots were harvested 12 September in Fargo and 19 September in Prosper. Only the two-center rows were harvested. Soluble solids this years were not done, since we got an early frost right before harvest.

## Results

Forage sorghum variety trials results, 2014, are reported in tables 1 and 2. Both experiments were conducted at Fargo and Prosper, ND. The number of total entries (31) for these years trial were too many to randomize in one experiment. Both experiments were side by side and were planted and harvested at the same time, so values are comparable. I run the statistical analysis separate and results are presented it in two separate tables, each by location and combined across two locations.

In experiment 1, the check forage sorghum variety, FS-05, was among the highest yielding varieties in both locations and when locations were combined. Other varieties that ranked high and were not significantly different to the check variety in the combined analysis were: SS405, SPX901, SPX903, and SPX28313 (Table 1). Forage yield fluctuated between 4.66 and 9.26 tons/acre.

In Experiment 2, the highest yielding varieties were the sweet sorghums 54126, 56111, and 36111. Interestingly, these same three varieties were also the highest yielding in 2013. Yield combined across locations fluctuated between 4.36 and 9.80 tons/acre. Newer sweet sorghum line have significantly higher yield than the old sweet sorghum varieties, such as M81-EDale, Theis, and Top76-6.

The 2014 season was cooler and wetter than normal. The month of August had normal temperatures which compensated the slow growth of the months before resulting in very similar yields as in 2013.

Forage sorghum yields in 2014 were similar compared with previous years. In 2013, the forage yield for both locations combined fluctuated between 4.44 and 9.77 tons/A.

**Table 1. Forage sorghum forage yield (d.m.) and plant height in Fargo and Prosper, ND, two locations in 2014 (Experiment 1).**

Variety	type	MG †	Fargo		Prosper		Combined	
			Yield tons/A	Height inches	Yield tons/A	Height inches	Yield tons/A	Height inches
Piper	Su		5.86	98	4.96	119	5.41	108
Hayking	Su		6.05	99	5.56	110	5.80	105
Forage king	Su		7.00	110	4.57	116	5.78	113
<b>FS-05</b>	FS	L	7.85	97	9.61	113	<b>8.73</b>	105
<b>SS405</b>	FS-Hyb.	L	8.28	110	7.67	117	7.98	113
1990	FS-Hyb.	PS	7.11	93	7.94	118	7.53	106
NK300	FS-Hyb.	M	8.33	77	6.62	73	7.47	75
SD1741BMR	SxSu	PS	6.94	98	7.38	110	7.16	104
<b>SPX901</b>	FS-Hyb.	PS	8.32	96	8.27	118	<b>8.30</b>	107
SPX902	FS-Hyb.	PS	7.29	101	6.49	115	6.89	108
<b>SPX903</b>	FS-Hyb.	PS	9.21	99	8.17	112	<b>8.69</b>	106
SPX904	FS-Hyb.	PS	7.71	102	7.31	119	7.51	110
SPS3952	FS-Hyb.	M	5.83	85	5.46	91	5.65	88
SPX3903	FS-Hyb.	L	6.01	62	5.06	65	5.54	63
SPX3902	FS-Hyb.	L	4.32	60	4.87	70	4.59	65
<b>SPX-28313</b>	FS-Hyb.	L	9.07	105	9.45	117	<b>9.26</b>	111
Trudan Headless	SuxSu	PS	6.92	99	6.91	108	6.91	103
Sordan Headless	SxSu	PS	7.53	102	7.13	118	7.33	110
SDH 2942BMR	SxSu	PS	5.58	85	5.32	96	5.45	91
SPX3952	SxSu	M	5.17	71	4.15	82	4.66	77
LSD (0.05)			1.98	8.86	2.26	12.2	1.38	9.8
CV, %			17.2	5.8	20.5	7.2	18.8	6.6
P<F			0.0004	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

† Mg = Maturity group, PS= Early, M= Medium, L=Late maturing.

‡Su= Sudan grass, FS= Forage sorghum, FS-Hyb.= Forage sorghum Hybrid, Su x Su= Sudangrass x Sudangrass, and SxS= Sorghumx Sudangrass

**Table 2. Sweet sorghum and hybrids forage yield and plant height in Fargo and Prosper in 2014 (Experiment 2).**

Variety	Fargo		Prosper		Combined	
	Yield Tons/A	Height inches	Yield Tons/A	Height inches	Yield Tons/A	Height inches
Pampa Verde Pacas	8.01	109	7.09	104	7.55	106
Pampa Verde BMR-6	7.25	86	5.47	90	6.36	88
Pampa Triunfo XLT	6.73	102	6.96	98	6.85	100
Pampa Centurion	7.01	80	5.99	75	6.50	77
BMR Brachytic sorghum	5.70	59	4.61	63	5.15	61
Pampa Mijo II	4.38	70	4.34	87	4.36	78
Pampa Karamelo	7.23	107	9.07	117	8.15	112
<b>Sweet sorghum 54126</b>	9.06	106	8.64	107	<b>8.85</b>	106
<b>Sweet sorghum 56111</b>	8.66	108	9.14	120	<b>8.90</b>	114
<b>Sweet sorghum 36111</b>	9.04	108	10.59	111	<b>9.80</b>	109
sweet sorghum 36126	7.92	92	6.74	102	7.33	97
Dale	6.25	93	5.73	98	5.99	96
M81-E	9.22	94	6.59	99	7.91	97
Theis	7.81	117	7.11	111	7.46	114
Top76-6	6.80	91	5.97	87	6.38	89
LSD (0.05)	2.27	11	1.60	26	1.76	25
CV	18.44	7.1	14.0	7.9	16.5	7.6
P<F	0.0078	<0.0001	<0.0001	<0.0001	0.0008	<0.0001