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Forage Report 2016

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Abstract

In 2016 summer annual forage variety trials were conducted across Kansas near Garden City, Hays, Hutchinson, Mound Valley, and Scandia. All sites evaluated hay and silage entries. Companies were able to enter varieties into any possible combinations of research sites, so not all sites had all varieties. Across the sites, a total of 99 hay varieties and 99 silage varieties were evaluated.

Keywords

Forage

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Cover Page Footnote

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J. D. Holman, G. Cramer, A. Esser, Jane Lingenfelser, S. Maxwell, J. L. Moyer, A. Obour, and T. Roberts



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Research and Extension

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

2016 Kansas Summer Annual Forage Hay and Silage Variety Trial

J. Holman, G. Cramer, A. Esser, J. Lingenfelser, S. Maxwell, J. Moyer, A. Obour, and T. Roberts

Summary

In 2016 summer annual forage variety trials were conducted across Kansas near Garden City, Hays, Hutchinson, Mound Valley, and Scandia. All sites evaluated hay and silage entries. Companies were able to enter varieties into any possible combinations of research sites, so not all sites had all varieties. Across the sites, a total of 99 hay varieties and 99 silage varieties were evaluated.

Introduction

In 2014 there was a total of 34,455,000 acres of hay and haylage harvested in the United States for a total of 95,372,000 dry matter tons of production. Yields averaged 2.77 tons of dry matter per acre. Of this total, about 13,580,000 acres were alfalfa, which averaged 3.76 dry matter tons per acre, and all other crops averaged 2.13 dry matter tons/a.

In Kansas, there were 2,420,000 acres of hay and haylage harvested with an average yield of 2.24 dry matter tons per acre in 2014. Of this total, 650,000 acres were alfalfa, with an average yield of 3.72 dry matter tons per acre, and 1,770,000 acres were crops other than alfalfa, with an average yield of 1.69 dry matter tons/a. Kansas was ranked 6th in the United States for hay and haylage production, which largely supports the state dairy (ranked 19th in the U.S. and valued at \$482,765,000), and cattle (feedlot, background, and cow/calf) industries (ranked second in the U.S. and valued at \$10,153,087,000). Dairy and beef cattle represented 58% of the total agriculture product of Kansas in 2014. Hay and grain commodities that support these two industries are critical for the state.

Study Objectives

The objectives of the Kansas Summer Annual Forage Variety Trial are to evaluate the performance of released and experimental varieties, determine where these varieties are best adapted, and increase the visibility of summer annual forages in Kansas. Breeders, marketers, and producers use data collected from the trials to make informed variety selections. The Summer Annual Forage Variety Trial is planted at locations across Kansas based on the interest of those entering varieties into the test.

Procedures

The Summer Annual Forage Variety Trial was conducted near Garden City, Hays, Hutchinson, Mound Valley, and Scandia. All of the sites evaluated hay and silage entries. Companies were able to enter varieties into any possible combinations of research sites, so not all sites had all varieties. In the hay test, there were 34 entries at Garden City, 24 at Hays, 4 at Hutchinson, 14 at Mound Valley, and 23 at Scandia. In the silage test, there were 48 entries at Garden City, 22 at Hays, 5 at Hutchinson, 9 at Mound Valley, and 15 at Scandia (Table 1). Across the sites, a total of 99 hay varieties

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and 99 silage varieties were evaluated. Information on the varieties is shown in Tables 2 and 3.

Management guidelines were provided to cooperators; however, previous growing experience influenced final management decisions. All trials were planted in small research plots (approximately 225 ft²) with three replications. Cultural practices (Table 4), growing season temperature, and precipitation (Figures 1-5) are provided for each site. Results are listed alphabetically by seed supplier. Forage samples were dried, ground, and analyzed for nutrient contents using NIR (near infrared reflectance) by SDK Laboratories in Hutchinson, KS. Nutrient contents measured were acid detergent fiber (ADF), neutral detergent fiber (NDF), in vitro true dry matter digestibility after 48 hours (IVTDMD@48hr), lignin, percent of NDF digestible after 48 hours (NDFD@48hr), nitrogen free NDF (NDFn), net energy for gain (NEG), net energy for lactation (NEL), net energy for maintenance (NEM), non-fibrous carbohydrates (NFC), crude protein, relative forage quality (RFQ), total digestible nutrients (TDN), and starch (silage only).

2016 Growing Conditions

Temperature and precipitation (Figures 1-5) for each site are shown. Thick black lines on the temperature graphs represent long-term average high and low temperatures (°F) for the location. The upper thin line represents actual daily high temperatures, and the lower thin line represents actual daily low temperatures. On the precipitation graph, the line labeled “normal” represents long-term average precipitation (1981-2010), and the line labeled “2016” represents actual precipitation.

In general, the 2016 growing season saw favorable moisture conditions throughout, although conditions were dry in the spring at Garden City and below normal at Scandia. Supplemental irrigation at Garden City negated any dry conditions, and precipitation at Scandia was still greater than the two western locations (Garden City and Hays).

Results and Discussion

Since all entries were not evaluated across all sites, data were analyzed by location. All locations had a control entry of Rox Orange (Waconia) and Sumac for the hay test, and a control entry of Kansas Orange for the silage test.

Hay Test

Averaged across locations, forage sorghum yielded slightly more than sorghum sudan, sudan, or millet at the first cutting, but in subsequent cuttings sorghum sudan yielded more (Table 5). Brown mid-rib (BMR) forage sorghum and sorghum sudan yields were comparable or greater than non-BMR types at the first cutting; in subsequent cuttings non-BMR types tended to yield more than BMR types. The BMR types had more IVTDMD, NDFD, and RFQ, and less lignin than non-BMR types.

At Garden City, Sweetleaf II, Grazex BMR 301, and Super Sugar DM were in the top LSD (Least Significant Difference at $P \leq 0.05$) group in the first cutting (Table 6). In the second cutting more separation occurred between entries, and Sweetleaf II, Canex, Sordan Headless, Grazex BMR 301, Grazex BMR 801, 121 BMR, and Super Sugar

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were in the highest yielding LSD group. Crude protein averaged 9.6% and TDN was 48.6%.

At Hays, Bruiser BMR had the greatest yield, and all varieties except Sumac, Waconia, Canex BMR 600, Drylander BMR, Arrow Experimental 1, Honey Graze V, Greentreat 1922, Nutrimax BMR, SSX1, Super Sugar DM, and Sweet Forever BMR, were in the top LSD group in the first cutting (Table 7). In the second cutting AS6402, Nutri King BMR, Super Sugar, and Sweet Six BMR were in the highest yielding LSD group. Crude protein averaged 10.7% and TDN was 54.5%.

At Hutchinson, there were no differences in yield or forage quality amongst the varieties (Table 8). Due to cutting later than normal, forage quality was lower, crude protein averaged 7.5%, and TDN was 61.7%.

At Mound Valley, AS6401, Cadan 99B, Sweet Sioux BMR, Wondergreen, S4B224, and S5C201 were in the top LSD group at the first cutting (Table 9). In the second cutting, Cadan 99B, Sweet Sioux WMR, Wondergreen, Super Sugar DM, and Sweet Six BMR were in the top LSD group. In the third and final cutting, Cadan 99B, Sweet Sioux WMR, and Wondergreen were in the top LSD group. Crude protein from the first cutting averaged 19.1% and TDN was 53.7%.

At Scandia, dry conditions limited regrowth, so only the first cutting was harvested. In the first cutting, Arrow Experimental 2, Canex, Drylander BMR, AS6401, Grazex BMR 301, Grazex BMR 801, Bruiser BMR, Nutrimax BMR, SSX1, Nutri King BMR, Super Sugar, Super Sugar DM, Sweet Forever BMR, and Sweet Six BMR were in the top LSD group (Table 10). Crude protein averaged 11.0% and TDN was 51.5%.

Silage Test

Averaged across locations, non-BMR forage sorghum types (14,700 lb/a) yielded slightly more than BMR sorghum types (12,600 lb/a) (Table 11). The BMR types had more IVTDM, NDFD, NEG, NEL, NEM, NFC, crude protein, RFQ, TDN, and starch, while having less ADF, NDF, and lignin than non-BMR types.

At Garden City, AF8301, NK300, SP1615, SP1880, SS304, SS405, X5063, X5129, Canex BMR 540, 4-EVERgreen, and GW 400 BMR were in the top LSD group for silage (Table 12). Crude protein averaged 6.5%, TDN was 53%, and starch was 11.5%.

At Hays, AF7102, SiloMor II, F4C204, GW 400 BMR, GW 600 BMR, and 3701 were in the top LSD group for silage (Table 13). Crude protein averaged 5.3%, TDN was 55.8%, and starch was 24%.

At Hutchinson, Kansas Orange, AF7401, and AF8301 were in the top LSD group for silage (Table 14). No forage quality data were available.

At Mound Valley, AF8301 was in the top LSD group for silage (Table 15). Crude protein averaged 7.1%, TDN was 52.7%, and starch was very low due to little or no grain production.

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At Scandia, 3701 was in the top LSD group for silage (Table 16). Crude protein averaged 5.7%, TDN was 51.5%, and starch was 11.4%.

Recommendation

Inestimable differences in soil type, weather, and environmental conditions play a part in increasing experimental error, therefore one should use more than one year of data to make an informed variety selection decision.

Acknowledgments

This work was funded in part by the Kansas Agricultural Experiment Station and seed suppliers. Sincere appreciation is expressed to all participating researchers and seed suppliers who have a vested interest in expanding and promoting annual forage production in the United States.

Table 1. Number of hay and silage entries for each location

Location	Silage	Hay
Garden City	48	34
Hays	22	24
Hutchinson	5	4
Mound Valley	9	14
Scandia	15	23
Total	99	99

Table 2. 2016 Hay Entries. Hybrid information was provided by seed companies

No.	Company	Variety/entry	Type ¹	BMR	Dwarf	Male sterile	Dry stalk	Photo-period sensitive	Maturity ²	Greenbug resistance
1	Advanta Seeds	AS6401	SS	Y	N	N	N	N	ML	N
2	Advanta Seeds	AS6402	SS	Y	Y	N	N	N	L	N
3	Arrow Seed	1st Choice BMR	SS	Y	N	N	N	N	ME	N
4	Arrow Seed	Arrow EXP1	SS	Y	N	N	N	N	L	N
5	Arrow Seed	Arrow EXP2	FS	Y	N	N	N	N	L	N
6	Arrow Seed	Honey Graze V	SS	N	N	N	N	N	L	N
7	Browning Seed	Cadan 99B	SS	N	N	N	Y	N	M	N
8	Browning Seed	SweetSioux BMR	SS	Y	N	N	N	N	M	N
9	Browning Seed	SweetSioux WMR	SS	N	N	N	Y	N	M	N
10	Browning Seed	Wondergreen	SS	N	N	N	Y	N	ME	N
11	CERES, Inc.	S4B224	SS	Y	N	N	N	N	L	N
12	CERES, Inc.	S5C201	SS	N	N	N	N	Y	L	N
13	Chromatin	CHR12FS0012	FS	N	N	N	N	N	M	N
14	Chromatin	HiKane II	FS	N	N	N	N	N	M	N
15	Chromatin	Millet BMF	MT	Y	N	N	N	N	E	N
16	Chromatin	Millex 32	MT	N	N	N	N	N	E	N
17	Chromatin	Sordan Headless	SS	N	N	N	N	Y	L	Y
18	Chromatin	SP4105	SS	Y	N	N	N	Y	L	Y
19	Chromatin	SP455	SS	Y	N	N	N	N	M	N
20	Chromatin	SP6205	SS	Y	Y	N	N	N	ML	N
21	Croplan	Greentreat 1731	SS	Y	Y	N	N	N	E	N
22	Croplan	Greentreat 1922	SS	Y	N	N	N	Y	L/PPS	N
23	Croplan	Greentreat Rocket	SU	Y	Y	N	N	N	M	N
24	KSU	Sumac	FS	N	N	N	N	N	M	N

continued

Table 2. 2016 Hay Entries. Hybrid information was provided by seed companies

No.	Company	Variety/entry	Type ¹	BMR	Dwarf	Male sterile	Dry stalk	Photo-period sensitive	Maturity ²	Greenbug resistance
25	KSU	Waconia	FS	N	N	N	N	N	M	N
26	Monsanto	BMR45S	SS	Y	N	Y	N	N	M	N
27	Monsanto	Nutri-Cane II	FS	N	N	Y	N	N	M	N
28	Monsanto	Sweetleaf II	FS	N	N	Y	N	N	M	N
29	Sharp Bros Seed	Canex	FS	N	N	Y	N	N	ME	N
30	Sharp Bros Seed	Canex BMR 210	FS	Y	N	N	N	N	M	N
31	Sharp Bros Seed	Canex BMR 600	FS	Y	N	Y	N	N	ML	N
32	Sharp Bros Seed	Canex BMR 600 w/ PO	FS	Y	N	N	N	N	ML	N
33	Sharp Bros Seed	Grazex BMR 301	SS	Y	N	Y	N	N	M	N
34	Sharp Bros Seed	Grazex BMR 801	SS	Y	N	Y	N	N	M	N
35	Star Seed	Bruiser BMR	SS	Y	N	Y	N	N	M	N
36	Star Seed	Drylander BMR	FS	Y	N	N	N	Y	L	N
37	Star Seed	Nutrimax BMR	SS	Y	N	N	N	N	L	N
38	Star Seed	SSX1	SS	Y	N	N	N	N	L	N
39	Sudax	111BMR	SS	Y	N	N	N	N	E	N
40	Sudax	121BMR	SS	Y	N	N	N	Y	L	N
41	Walter Moss Seed	Mega green	SS	N	N	N	N	Y	L	Y
42	Ward Seed	Nutri King BMR	SS	Y	N	N	N	N	ME	N
43	Ward Seed	Super Sugar	SS	N	N	N	N	N	E	N
44	Ward Seed	Super Sugar DM	SS	N	N	N	N	N	L	N
45	Ward Seed	Sweet Forever BMR	SS	Y	N	N	N	Y	L	N
46	Ward Seed	Sweet Six BMR	SS	Y	N	N	Y	N	E	N

¹ Abbreviations: Forage sorghum (FS), sorghum sudan (SS), sudan grass (SN), millet (MT).

² Maturity groups: Early (E), medium early (ME), medium (M), medium late (ML), late (L), and full (F).

Table 3. 2016 Silage Entries. Hybrid information was provided by seed companies

No.	Company	Variety/entry	Type ¹	BMR	Dwarf	Male sterile	Dry stalk	Photo-period sensitive	Maturity ²	Greenbug resistance	1,000 seed weight g
1	Advanta Seeds	AF7101	FS	Y	N	N	Y	N	E	N	36.67
2	Advanta Seeds	AF7102	FS	Y	Y	N	N	N	E	N	24.17
3	Advanta Seeds	AF7401	FS	Y	Y	N	N	N	L	N	22.95
4	Advanta Seeds	AF8301	FS	N	Y	N	N	N	ML	N	32.12
5	Arrow Seed	SiloMor II	FS	N	N	N	N	N	L	N	30.53
6	Arrow Seed	SiloMor II BMR	FS	Y	N	N	N	N	L	N	28.74
7	CERES, Inc.	F4C204	FS	N	N	N	N	N	E	N	26.25
8	CERES, Inc.	F4C207	FS	N	N	N	N	N	ML	N	28.31
9	Chromatin	CHR12FS0012	FS	N	N	N	N	N	M	N	26.67
10	Chromatin	CHR14FB0240	FS	Y	N	N	N	N	M	N	33.37
11	Chromatin	HiKane II	FS	N	N	N	N	N	M	N	22.64
12	Chromatin	NK300	FS	N	N	N	N	N	ME	N	32.96
13	Chromatin	Red Top+BMT	FS	Y	N	N	N	N	M	N	30.17
14	Chromatin	Sordan Headless	SS	N	N	N	N	Y	L	N	29.96
15	Chromatin	SP1615	FS	N	N	N	N	Y	L	N	26.58
16	Chromatin	SP1880	FS	N	N	N	N	N	L	N	32.27
17	Chromatin	SP2774BMR	FS	Y	N	N	N	N	M	N	26.39
18	Chromatin	SP2876BMR	FS	Y	N	N	N	N	M	N	23.94
19	Chromatin	SP3902BD	FS	Y	Y	N	N	N	L	N	33.48
20	Chromatin	SP3903BD	FS	Y	Y	N	N	N	ML	N	30.55
21	Chromatin	SP4105BMR	SS	Y	N	N	N	Y	L	N	28.15
22	Chromatin	SS304	FS	N	N	N	N	N	L	N	24.71
23	Chromatin	SS405	FS	N	N	N	N	N	L	N	27.04
24	Croplan	3701	FS	N	N	N	N	N	L	N	26.61
25	Croplan	BMR 3411	FS	Y	N	N	N	N	ME	N	33.44
26	Croplan	BMR 3561	FS	Y	N	Y	N	N	M	N	26.16
27	Croplan	BMR 3631	FS	Y	Y	N	N	N	ML	N	32.75

continued

Table 3. 2016 Silage Entries. Hybrid information was provided by seed companies

No.	Company	Variety/entry	Type ¹	BMR	Dwarf	Male sterile	Dry stalk	Photo-period sensitive	Maturity ²	Greenbug resistance	1,000 seed weight g
28	KSU	Kansas Orange	FS	N	N	N	N	N	M	N	18.62
29	Monsanto	Nutri-Choice II	FS	N	N	Y	N	N	ML	N	33.71
30	Scott Seed Co	X50610	FS	Y	Y	N	N	N	L	N	30.08
31	Scott Seed Co	X5063	FS	Y	N	Y	N	N	M	N	26.99
32	Scott Seed Co	X50711	FS	N	N	N	N	N	L	N	37.18
33	Scott Seed Co	X50712	FS	N	N	N	N	N	M	N	30.66
34	Scott Seed Co	X5129	FS	N	N	N	N	Y	L	N	23.50
35	Scott Seed Co	X51410	FS	Y	Y	N	N	N	L	N	33.13
36	Scott Seed Co	X51423	FS	Y	N	N	N	N	M	N	32.58
37	Scott Seed Co	X5143	FS	Y	N	Y	N	N	M	N	30.04
38	Sharp Bros Seed	Canex BMR 210	FS	Y	N	N	N	N	M	N	26.91
39	Sharp Bros Seed	Canex BMR 540	FS	Y	Y	N	N	N	ML	N	30.21
40	Sharp Bros Seed	Canex BMR 550	FS	Y	Y	N	N	N	ML	N	33.25
41	Sharp Bros Seed	Canex BMR 600 w/ PO	FS	Y	N	N	N	N	ML	N	27.64
42	Sharp Bros Seed	Silex BMR 503	FS	Y	Y	N	N	N	ML	N	29.40
43	Star Seed	Magnum Ultra BMR	FS	Y	N	Y	N	N	L	N	26.76
44	Sudax	331BMR	FS	Y	Y	N	N	N	ML	N	31.33
45	Sudax	ESP1601	FS	Y	N	N	N	N	ME	N	33.48
46	Walter Moss Seed	4EVERgreen	FS	N	N	N	N	Y	L	Y	27.52
47	Ward Seed	EXP: 10216	FS	Y	N	Y	Y	N	E	N	26.15
48	Ward Seed	GW 400 BMR	FS	Y	N	Y	N	N	ME	N	25.11
49	Ward Seed	GW 600 BMR	FS	Y	N	N	Y	N	M	N	32.40
50	Ward Seed	GW-2120	FS	N	N	Y	N	N	M	N	24.26
51	Ward Seed	Silo Pro BMR	FS	Y	Y	N	N	N	M	N	32.62

¹ Abbreviations: Forage sorghum (FS), sorghum sudan (SS), sorghum (S).

² Maturity groups: Early (E), medium early (ME), medium (M), medium late (ML), late (L), and full (F).

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Table 4. Irrigation, planting, harvesting, and fertilizing details for hay and silage variety tests near Garden City, Hays, Hutchinson, Mound Valley, and Scandia, KS, in 2016

Location	Irrigation	Planting date	1st	2nd	3rd	Seeding rate	Harvest area	Fertilizer	
			harvest date	harvest date	harvest date			N	P ₂ O ₅
						lb/a	ft ²	----- lb/a -----	
Hay test									
Garden City	10.49	3-Jun	4-Aug	22-Sep	-*	20	225	180	0
Hays	-	6-Jun	18-Aug	17-Oct	-	15	90	50	30
Hutchinson	-	10-Jun	10-Aug	19-Sep	-	20	54	50	0
Mound Valley	-	9-Jun	13-Jul	18-Aug	4-Oct	20	45	150	60
Scandia	-	10-Jun	10-Aug	-	-	30	60	50	0

Location	Irrigation	Planting date	1st	2nd	3rd	Seeding rate	Harvest area	Fertilizer	
			harvest date	harvest date	harvest date			N	P ₂ O ₅
						seeds/a	ft ²	----- lb/a -----	
Silage test									
Garden City	10.49	15-Jun	-**	-	-	80,000	225	180	0
Hays	-	7-Jun	-	-	-	50,000	12.5	50	30
Hutchinson	-	10-Jun	-	-	-	50,000	87	100	0
Mound Valley	-	9-Jun	-	-	-	100,000	100	150	60
Scandia	-	9-Jun	-			92,400	12.5	50	0

*Based on growing conditions and plant regrowth, some sites were cut more than others.

**Silage entries were harvested at soft dough or end of season for varieties that did not reach soft dough.

Table 5. Hay performance across locations summary

Type	Performance			Forage quality														
	1st cutting	2nd cutting	Total yield	ADF	IVTDMD			NDFD			NDFn	NEG	NEL	NEM	NFC	Crude protein	RFQ	TDN
					@48hr	Lignin	@48hr											
	----- lb DM/a -----			----- % -----														
Forage Sorghum (26)*	7,245	1,942	9,187	40.36	62.58	73.30	7.66	55.16	58.20	0.24	0.53	0.56	18.39	10.34	94.08	52.65		
Sorghum Sudan (68)	7,069	2,596	9,664	40.69	62.19	74.53	7.72	55.94	57.84	0.22	0.52	0.55	15.90	11.86	88.95	51.80		
Sudan (3)	6,320	2,093	8,413	41.40	60.71	75.72	7.28	58.23	56.46	0.21	0.51	0.54	14.49	12.12	88.88	51.02		
Millet (2)	6,101	133	6,234	42.37	65.36	70.45	8.99	51.63	60.78	0.19	0.49	0.51	14.26	10.96	81.79	48.95		
Forage Sorghum BMR (9)	7,255	1,836	9,091	40.95	63.23	75.79	7.29	57.94	58.80	0.23	0.53	0.56	16.77	10.08	94.48	52.52		
Forage Sorghum Non-BMR (17)	7,211	2,291	9,502	40.05	62.23	71.97	7.84	53.68	57.88	0.24	0.53	0.56	19.25	10.47	93.87	52.73		
Sorghum Sudan BMR (53)	7,093	2,526	9,619	40.83	62.37	74.63	7.66	56.45	58.00	0.23	0.52	0.55	16.09	11.45	89.89	51.93		
Sorghum Sudan Non-BMR (15)	6,766	3,428	10,194	40.16	61.54	74.18	7.91	54.16	57.24	0.22	0.52	0.55	15.26	13.31	85.62	51.38		

*Number in parenthesis is the number of variety × location entries across the state of Kansas.

Table 6a. Hay performance test near Garden City

Brand	Name	Performance						
		1st cutting	2nd cutting	Total yield	1st cutting	2nd cutting	1st height	2nd height
		lb DM/a			% moisture		in.	
Forage sorghum								
Chromatin	CHR12FS0012	5,213	2,843	8,055	0.86	0.86	84	61
Chromatin	HiKane II	10,263	3,312	13,574	0.85	0.85	92	63
KSU	Sumac	7,862	2,894	10,757	0.86	0.86	86	54
KSU	Waconia	8,671	1,617	10,288	0.87	0.87	86	55
Monsanto	Nutri-Cane II	7,504	2,140	9,644	0.88	0.88	92	54
Monsanto	Sweetleaf II	12,504	4,830	17,334	0.78	0.78	102	90
Sharp Bros Seed	Canex	8,784	3,976	12,759	0.85	0.85	84	68
Sharp Bros Seed	Canex BMR 600	7,158	2,303	9,462	0.88	0.88	102	58
Star Seed	Drylander BMR	5,791	962	6,753	0.90	0.90	97	56
Millet								
Chromatin	Millex 32	7,253	0	7,253	0.83	0.83	102	0
Chromatin	Millex BMR	4,949	266	5,215	0.86	0.86	70	15
Sorghum sudan								
Advanta Seeds	AS6401	7,949	3,055	11,004	0.87	0.87	104	71
Advanta Seeds	AS6402	6,956	3,023	9,979	0.85	0.85	85	54
Chromatin	Sordan Headless	7,779	3,836	11,614	0.88	0.88	106	76
Chromatin	SP4105	7,143	1,912	9,056	0.88	0.88	82	53
Chromatin	SP455	8,734	2,941	11,675	0.85	0.85	99	73
Chromatin	SP6205	6,582	1,830	8,412	0.85	0.85	88	55
Croplan	Greentreat 1731	6,105	1,985	8,090	0.85	0.85	85	52

continued

Table 6a. Hay performance test near Garden City

Brand	Name	Performance						
		1st cutting	2nd cutting	Total yield	1st cutting	2nd cutting	1st height	2nd height
		lb DM/a			% moisture		in.	
Sorghum sudan, continued								
Croplan	Greentreat 1922	5,146	2,724	7,870	0.90	0.90	84	58
Monsanto	BMR45S	10,039	3,227	13,266	0.83	0.83	100	75
Sharp Bros Seed	Grazex BMR 301	11,353	3,665	15,018	0.83	0.83	110	81
Sharp Bros Seed	Grazex BMR 801	9,908	3,423	13,331	0.83	0.83	104	75
Star Seed	Bruiser BMR	7,009	1,721	8,730	0.86	0.86	90	55
Star Seed	Nutrimax BMR	6,592	2,347	8,939	0.87	0.87	98	57
Star Seed	SSX1	6,542	1,795	8,337	0.88	0.88	96	59
Sudax	111 BMR	7,417	2,150	9,567	0.81	0.86	98	67
Sudax	121 BMR	6,025	3,428	9,453	0.90	0.90	87	60
Walter Moss Seed	Mega green	8,567	2,792	11,359	0.88	0.88	104	73
Ward Seed	Nutri King BMR	9,880	2,877	12,757	0.85	0.85	94	71
Ward Seed	Super Sugar	8,723	3,689	12,413	0.83	0.83	100	76
Ward Seed	Super Sugar DM	10,784	3,066	13,850	0.85	0.85	110	76
Ward Seed	Sweet Forever BMR	8,370	2,645	11,015	0.88	0.88	106	78
Ward Seed	Sweet Six BMR	9,035	2,839	11,874	0.83	0.83	102	74
Sudan								
Croplan	Greentreat Rocket	7,048	2,749	9,798	0.89	0.89	80	55
	Average	7,931	2,614	10,544	0.86	0.86	94.39	61.70
	LSD (0.05)	1,954	1,416	2,269				

Plant date: 6/3/2016

Days to harvest: 62 49

Table 6b. Hay performance test near Garden City

		Forage quality												
Brand	Name	ADF	IVTDMD			NDFD			Crude					
			NDF	@48hr	Lignin	@48hr	NDFn	NEG	NEL	NEM	NFC	protein	RFQ	TDN
		----- % -----												
		Forage sorghum												
Chromatin	CHR12FS0012	43.94	66.17	66.87	9.10	47.17	61.54	0.16	0.47	0.49	16.14	9.34	74.28	47.30
Chromatin	HiKane II	43.48	64.99	65.80	9.33	47.83	60.44	0.17	0.48	0.50	17.31	8.49	75.05	47.64
KSU	Sumac	41.72	63.81	67.93	8.60	50.53	59.34	0.20	0.50	0.53	19.36	8.31	82.72	50.00
KSU	Waconia	41.98	64.98	67.70	8.82	51.30	60.43	0.19	0.50	0.52	16.95	9.05	82.59	49.39
Monsanto	Nutri-Cane II	42.17	64.26	67.87	9.17	51.00	59.77	0.18	0.49	0.51	16.56	9.15	80.54	48.70
Monsanto	Sweetleaf II	45.45	69.12	63.37	10.15	44.17	64.28	0.15	0.46	0.48	15.41	8.66	68.93	46.38
Sharp Bros Seed	Canex	41.04	63.06	68.33	9.10	49.30	58.65	0.21	0.51	0.54	20.47	8.67	86.64	50.73
Sharp Bros Seed	Canex BMR 600	42.39	65.21	70.90	8.77	53.50	60.65	0.19	0.49	0.52	15.52	9.13	81.21	49.09
Star Seed	Drylander BMR	44.46	66.91	72.80	8.74	55.90	62.23	0.18	0.48	0.51	13.29	8.67	75.46	48.36
		Millet												
Chromatin	Millex 32	45.06	67.56	64.95	9.96	45.25	62.83	0.15	0.46	0.48	14.66	9.51	69.68	46.09
Chromatin	Millex BMR	39.69	63.20	74.55	8.41	56.30	58.77	0.22	0.52	0.54	13.86	12.31	92.89	51.22
		Sorghum sudan												
Advanta Seeds	AS6401	42.33	63.45	71.93	8.93	53.50	59.01	0.18	0.49	0.51	14.44	11.12	81.72	48.77
Advanta Seeds	AS6402	41.91	62.87	73.23	8.15	56.33	58.47	0.19	0.50	0.52	13.41	11.83	84.36	49.57
Chromatin	Sordan Headless	44.75	65.34	68.20	9.56	50.15	60.77	0.15	0.46	0.48	14.04	9.44	70.57	46.17
Chromatin	SP4105	44.26	64.03	73.57	8.05	59.03	59.55	0.18	0.49	0.51	12.93	9.48	77.36	48.61
Chromatin	SP455	42.37	63.56	68.60	8.62	51.23	59.11	0.19	0.49	0.51	16.39	9.87	81.61	48.96
Chromatin	SP6205	42.28	63.82	71.23	8.46	54.03	59.36	0.18	0.48	0.51	13.74	10.89	80.85	48.48
Croplan	Greentreat 1731	42.83	64.86	70.03	8.68	53.53	60.32	0.18	0.49	0.51	14.04	10.28	80.01	48.55

continued

Table 6b. Hay performance test near Garden City

		Forage quality												
Brand	Name	ADF	NDF	IVTDMD @48hr	Lignin	NDFD @48hr	NDFn	NEG	NEL	NEM	NFC	Crude protein	RFQ	TDN
----- % -----														
Croplan	Greentreat 1922	42.35	61.93	74.23	8.09	57.67	57.60	0.18	0.49	0.51	12.53	11.92	81.14	48.76
Monsanto	BMR45S	40.80	63.48	71.13	8.90	52.17	59.04	0.21	0.51	0.54	18.18	9.42	88.73	50.84
Sharp Bros Seed	Grazex BMR 301	44.24	67.86	65.00	10.06	47.05	63.11	0.16	0.46	0.48	15.16	8.23	71.11	46.67
Sharp Bros Seed	Grazex BMR 801	44.22	66.81	66.33	9.63	46.90	62.14	0.16	0.47	0.49	15.70	8.80	72.52	46.89
Star Seed	Bruiser BMR	41.41	64.69	72.97	7.82	57.00	60.16	0.22	0.52	0.55	16.06	9.47	89.92	51.50
Star Seed	Nutrimax BMR	42.24	63.81	72.30	8.63	54.53	59.35	0.19	0.49	0.52	15.94	9.05	82.08	49.38
Star Seed	SSX1	43.60	64.71	71.90	9.07	53.63	60.18	0.17	0.48	0.50	13.93	9.56	76.16	47.69
Sudax	111 BMR	43.25	64.32	72.40	7.95	57.80	59.81	0.19	0.50	0.52	13.68	9.96	79.94	49.49
Sudax	121 BMR	43.18	63.50	73.50	8.31	58.65	59.05	0.19	0.50	0.52	14.29	9.29	80.93	49.48
Walter Moss Seed	Mega green	45.13	66.61	68.30	9.34	49.97	61.95	0.15	0.46	0.48	13.72	9.35	69.82	46.33
Ward Seed	Nutri King BMR	43.04	64.40	69.30	8.90	52.60	59.89	0.19	0.49	0.51	16.14	9.21	80.22	49.01
Ward Seed	Super Sugar	42.29	64.57	67.63	8.78	48.37	60.05	0.19	0.49	0.51	17.42	9.47	80.96	48.91
Ward Seed	Super Sugar DM	44.76	66.87	66.37	9.73	47.27	62.19	0.15	0.46	0.48	15.14	8.81	70.52	46.44
Ward Seed	Sweet Forever BMR	44.21	65.89	70.30	9.56	52.03	61.28	0.16	0.47	0.49	14.07	9.29	73.89	47.30
Ward Seed	Sweet Six BMR	43.15	64.75	67.93	9.26	50.70	60.22	0.19	0.49	0.51	16.83	9.14	79.71	48.92
Sudan														
Croplan	Greentreat Rocket	41.97	61.35	74.30	8.19	57.30	57.05	0.19	0.49	0.51	13.40	11.83	82.51	49.03
	Average	41.97	64.79	69.76	8.91	52.17	60.25	0.18	0.49	0.51	15.32	9.62	79.02	48.55
	LSD (0.05)	1.68	2.02	2.68	0.68	3.19	1.88	0.03	0.02	0.03	2.02	1.40	7.49	2.04

Table 7a. Hay performance test near Hays

Brand	Name	Performance						
		1st cutting	2nd cutting	Total yield	1st cutting	2nd cutting	1st height	2nd height
		lb DM/a			% moisture		in.	
Forage sorghum								
Arrow Seed	Arrow EXP2	8,076	1,007	9,083	0.75	0.49	80	27
KSU	Sumac	7,375	1,323	8,697	0.75	0.60	64	21
KSU	Waconia	7,628	1,507	9,135	0.75	0.49	71	31
Sharp Bros Seed	Canex	9,347	985	10,332	0.72	0.62	65	28
Sharp Bros Seed	Canex BMR 210	8,869	584	9,453	0.75	0.50	79	24
Sharp Bros Seed	Canex BMR 600	6,087	1,089	7,176	0.78	0.52	82	25
Star Seed	Drylander BMR	7,100	701	7,802	0.78	0.60	90	33
Sorghum sudan								
Advanta Seeds	AS6401	8,246	1,699	9,944	0.74	0.62	83	27
Advanta Seeds	AS6402	8,188	1,767	9,955	0.73	0.57	76	32
Arrow Seed	1st Choice BMR	8,630	1,201	9,831	0.73	0.56	73	27
Arrow Seed	Arrow EXP1	6,556	973	7,529	0.79	0.58	85	24
Arrow Seed	Honey Graze V	5,741	1,477	7,217	0.76	0.65	86	33
Croplan	Greentreat 1922	6,617	1,556	8,173	0.77	0.51	83	23

continued

Table 7a. Hay performance test near Hays

Brand	Name	Performance						
		1st cutting	2nd cutting	Total yield	1st cutting	2nd cutting	1st height	2nd height
		----- lb DM/a -----			----- % moisture -----		----- in. -----	
Sorghum sudan, continued								
Sharp Bros Seed	Grazex BMR 301	7,960	1,045	9,005	0.71	0.62	77	27
Sharp Bros Seed	Grazex BMR 801	9,533	1,710	11,243	0.72	0.57	86	30
Star Seed	Bruiser BMR	9,945	865	10,811	0.72	0.57	82	25
Star Seed	Nutrimax BMR	6,861	923	7,783	0.78	0.59	85	21
Star Seed	SSX1	6,733	832	7,565	0.78	0.62	82	28
Ward Seed	Nutri King BMR	9,365	2,290	11,654	0.73	0.60	71	29
Ward Seed	Super Sugar	8,784	1,935	10,719	0.69	0.59	68	33
Ward Seed	Super Sugar DM	7,690	1,673	9,363	0.74	0.59	80	31
Ward Seed	Sweet Forever BMR	7,251	1,118	8,369	0.76	0.59	92	27
Ward Seed	Sweet Six BMR	9,367	2,501	11,868	0.71	0.60	90	34
Sudan								
Croplan	Greentreat Rocket	6,689	1,436	8,125	0.78	0.62	86	30
	Average	7,860	1,342	9,201	0.75	0.58	79.88	27.90
	LSD (0.05)	2,187	768	2,370				
Plant date: 6/6/2016								
Days to harvest:		73	60					

Table 7b. Hay performance test near Hays

Brand	Name	Forage quality												
		ADF	NDF	IVTDMD @48hr	Lignin	NDFD @48hr	NDFn	NEG	NEL	NEM	NFC	Crude protein	RFQ	TDN
		----- % -----												
Forage sorghum														
Arrow Seed	Arrow EXP2	41.54	62.44	75.57	7.18	57.87	58.07	0.22	0.52	0.55	16.83	9.68	91.16	51.88
KSU	Sumac	36.32	56.87	76.87	6.14	59.53	52.89	0.29	0.58	0.62	23.16	10.80	117.15	57.05
KSU	Waconia	36.69	59.05	75.03	6.33	58.57	54.91	0.28	0.57	0.61	21.57	10.77	113.42	56.26
Sharp Bros Seed	Canex	34.47	54.40	78.10	6.50	59.27	50.59	0.32	0.60	0.64	27.02	10.32	125.12	58.91
Sharp Bros Seed	Canex BMR 210	37.02	59.50	77.97	6.19	61.67	55.34	0.30	0.58	0.62	22.22	9.81	116.21	57.41
Sharp Bros Seed	Canex BMR 600	38.13	61.01	76.63	6.48	59.50	56.74	0.26	0.55	0.59	18.36	10.75	105.73	54.57
Star Seed	Drylander BMR	38.65	61.34	77.73	6.31	60.10	57.05	0.26	0.55	0.59	18.71	10.12	105.01	54.74
Sorghum sudan														
Advanta Seeds	AS6401	38.44	58.86	78.03	6.22	62.37	54.74	0.27	0.56	0.60	19.02	11.35	108.80	55.58
Advanta Seeds	AS6402	39.27	59.90	76.43	6.37	60.80	55.71	0.26	0.56	0.59	18.28	11.23	105.64	54.85
Arrow Seed	1st Choice BMR	36.94	58.61	78.10	6.00	62.90	54.50	0.29	0.58	0.62	20.26	10.97	116.05	56.88
Arrow Seed	Arrow EXP1	40.16	60.54	76.30	6.84	57.57	56.30	0.23	0.52	0.55	16.97	10.86	93.74	51.92
Arrow Seed	Honey Graze V	39.91	60.77	73.97	7.04	56.60	56.52	0.24	0.53	0.56	17.77	10.78	97.08	52.68
Croplan	Greentreat 1922	42.16	62.35	75.53	6.82	59.03	57.99	0.21	0.51	0.54	14.06	10.92	87.94	50.96

continued

Table 7b. Hay performance test near Hays

Brand	Name	Forage quality												
		ADF	NDF	IVTDMD	Lignin	NDFD	NDFn	NEG	NEL	NEM	NFC	Crude	RFQ	TDN
				@48hr		@48hr						protein		
----- % -----														
Sorghum sudan, continued														
Sharp Bros Seed	Grazex BMR 301	37.69	59.78	74.77	6.41	58.07	55.60	0.26	0.55	0.59	18.94	11.27	106.66	54.78
Sharp Bros Seed	Grazex BMR 801	38.44	60.24	74.52	6.52	57.52	56.03	0.26	0.55	0.59	19.03	10.81	104.95	54.51
Star Seed	Bruiser BMR	35.91	58.12	77.83	6.21	61.70	54.05	0.29	0.58	0.62	20.70	11.25	117.73	56.92
Star Seed	Nutrimax BMR	41.19	63.15	76.03	7.08	58.13	58.73	0.23	0.53	0.56	18.20	8.65	92.12	52.64
Star Seed	SSX1	41.40	63.06	76.17	6.99	57.63	58.65	0.23	0.52	0.55	16.92	9.61	91.80	52.04
Ward Seed	Nutri King BMR	38.84	59.80	74.33	6.78	57.83	55.62	0.25	0.55	0.58	19.74	10.21	102.08	54.04
Ward Seed	Super Sugar	37.04	59.19	73.93	6.61	55.93	55.04	0.26	0.55	0.59	19.49	11.88	108.82	54.80
Ward Seed	Super Sugar DM	38.95	61.14	73.27	6.99	55.43	56.86	0.26	0.55	0.58	20.23	10.21	102.33	54.20
Ward Seed	Sweet Forever BMR	40.25	60.75	75.60	7.26	55.60	56.50	0.24	0.54	0.57	18.67	10.91	97.68	53.05
Ward Seed	Sweet Six BMR	38.06	59.85	74.70	6.38	58.93	55.66	0.26	0.55	0.59	18.40	11.54	106.01	54.68
Sudan														
Croplan	Greentreat Rocket	38.20	57.33	76.23	6.39	60.13	53.32	0.25	0.54	0.58	17.25	12.33	102.78	53.65
	Average	38.57	59.92	75.99	6.59	58.86	55.73	0.26	0.55	0.59	19.24	10.71	104.83	54.54
	LSD (0.05)	2.72	3.23	2.43	0.84	3.60	3.00	0.03	0.03	0.03	2.87	1.97	12.54	2.57

Table 8a. Hay performance test near Hutchinson

Table 5a. Hay performance test near Hutchinson								
Brand	Name	Performance						
		1st cutting	2nd cutting	Total yield	1st cutting	2nd cutting	1st height	2nd height
		----- lb DM/a -----			----- % moisture -----		----- in. -----	
Forage sorghum								
KSU	Sumac	5,500	1,534	7,034	0.69	0.73	68	46
KSU	Waconia	7,279	970	8,249	0.73	0.72	74	25
Sorghum sudan								
Advanta Seeds	AS6401	5,961	1,282	7,243	0.70	0.74	71	38
Advanta Seeds	AS6402	5,939	1,454	7,393	0.68	0.75	76	35
	Average	6,170	1,310	7,480	0.70	0.73	72	36
	LSD (0.05)	3,270	709	3,033				
Plant date: 6/9/2016								
Days to harvest:		91	42					

[illegible]

Table 9a. Hay performance test near Mound Valley

Brand	Name	Performance						
		1st cutting	2nd cutting	3rd cutting	Total yield	1st cutting	2nd cutting	3rd cutting
		----- lb DM/a -----				----- % moisture -----		
Forage sorghum								
KSU	Sumac	2,260	2,012	1,173	5,445	0.90	0.83	0.73
KSU	Waconia	2,381	2,246	913	5,540	0.90	0.80	0.65
Sorghum sudan								
Advanta Seeds	AS6401	4,130	3,847	3,862	11,839	0.90	0.82	0.83
Advanta Seeds	AS6402	3,708	2,695	2,994	9,397	0.88	0.80	0.76
Browning Seed	Cadan 99B	4,663	5,157	6,366	16,186	0.88	0.79	0.79
Browning Seed	Sweet Sioux BMR	4,363	3,387	5,086	12,836	0.89	0.82	0.81
Browning Seed	Sweet Sioux WMR	3,797	5,708	6,700	16,206	0.88	0.78	0.77
Browning Seed	Wondergreen	4,119	5,233	6,103	15,455	0.88	0.78	0.79
CERES, Inc.	S4B224	4,405	2,789	3,295	10,488	0.88	0.81	0.78
CERES, Inc.	S5C201	4,280	2,831	2,520	9,631	0.90	0.82	0.82
Ward Seed	Nutri King BMR	3,702	3,886	1,512	9,100	0.90	0.82	0.70
Ward Seed	Super Sugar DM	2,786	4,518	2,566	9,871	0.89	0.81	0.80
Ward Seed	Sweet Forever BMR	3,460	2,717	1,015	7,192	0.89	0.80	0.71
Ward Seed	Sweet Six BMR	3,084	4,928	2,021	10,033	0.90	0.79	0.72
	Average	3,653	3,711	3,295	10,658	0.89	0.81	0.76
	LSD (0.05)	796	1,606	1,367	2,626			
Plant date: 6/9/2016								
Days to harvest:		34	36	48				

Table 9b. Hay performance test near Mound Valley

Brand	Name	Forage quality												
		ADF	NDF	IVTDMD	Lignin	NDFD	NDFn	NEG	NEL	NEM	NFC	Crude protein	RFQ	TDN
				@48hr		@48hr								
----- % -----														
Forage sorghum														
KSU	Sumac	36.20	56.86	81.57	6.97	59.00	52.88	0.26	0.55	0.59	13.01	19.71	86.05	54.51
KSU	Waconia	36.48	56.83	80.37	7.14	57.33	52.85	0.25	0.54	0.57	13.58	18.84	87.51	53.56
Sorghum sudan														
Advanta Seeds	AS6401	36.87	57.01	82.20	7.27	60.97	53.02	0.26	0.55	0.59	12.19	19.69	83.85	54.47
Advanta Seeds	AS6402	36.68	57.10	83.57	6.92	62.20	53.10	0.27	0.56	0.60	11.96	20.16	83.69	55.20
Browning Seed	Cadan 99B	37.61	59.60	77.43	7.44	54.30	55.43	0.24	0.54	0.57	13.33	18.34	85.26	53.04
Browning Seed	Sweet Sioux BMR	36.54	57.51	80.23	7.30	57.83	53.48	0.25	0.54	0.58	12.52	19.50	84.28	53.83
Browning Seed	Sweet Sioux WMR	38.47	59.74	77.33	7.75	53.80	55.56	0.23	0.53	0.56	13.17	17.93	82.34	52.13
Browning Seed	Wondergreen	38.77	59.79	76.77	7.75	54.10	55.60	0.23	0.53	0.56	13.97	16.98	86.71	52.27
CERES, Inc.	S4B224	36.16	57.02	81.50	6.97	60.10	53.03	0.26	0.55	0.59	12.22	19.83	85.65	54.61
CERES, Inc.	S5C201	37.80	59.30	78.43	7.55	57.27	55.15	0.24	0.53	0.57	12.56	17.74	87.82	52.97
Ward Seed	Nutri King BMR	36.84	57.46	81.13	7.29	59.47	53.44	0.25	0.54	0.58	12.57	19.28	85.13	53.92
Ward Seed	Super Sugar DM	35.50	56.20	80.27	7.60	55.80	52.27	0.25	0.54	0.57	12.94	20.23	81.38	53.45
Ward Seed	Sweet Forever BMR	36.31	57.55	81.63	7.20	59.33	53.52	0.26	0.55	0.59	12.35	19.76	84.66	54.42
Ward Seed	Sweet Six BMR	37.49	57.38	80.73	7.17	58.60	53.36	0.25	0.54	0.58	12.43	19.31	81.56	53.65
	Average	36.98	57.81	80.23	7.31	57.86	53.76	0.25	0.54	0.58	12.77	19.09	84.71	53.72
	LSD (0.05)	1.83	2.28	2.42	0.64	2.79	2.12	0.03	0.02	0.02	1.52	1.65	7.59	1.81

Plant date: 6/9/2016

FORAGE REPORT 2016

Table 10a. Hay performance test near Scandia

Brand	Name	Performance		
		1st cutting		
		lb DM/a	% moisture	in.
Forage sorghum				
Arrow Seed	Arrow EXP2	7377	0.81	82
KSU	Sumac	6510	0.82	76
KSU	Waconia	6470	0.82	78
Sharp Bros Seed	Canex	7681	0.81	88
Sharp Bros Seed	Canex BMR 600 w/ PO	6670	0.82	68
Star Seed	Drylander BMR	8024	0.82	70
Sorghum sudan				
Advanta Seeds	AS6401	7621	0.81	90
Advanta Seeds	AS6402	6190	0.81	60
Arrow Seed	1st Choice BMR	6648	0.81	70
Arrow Seed	Arrow EXP1	6493	0.83	74
Arrow Seed	Honey Graze V	5791	0.82	96
Croplan	Greentreat 1922	5207	0.87	62
Sharp Bros Seed	Grazex BMR 301	8556	0.76	92
Sharp Bros Seed	Grazex BMR 801	8848	0.78	94
Star Seed	Bruiser BMR	7476	0.82	62
Star Seed	Nutrimax BMR	7535	0.82	72
Star Seed	SSX1	7536	0.82	74
Ward Seed	Nutri King BMR	8264	0.79	90
Ward Seed	Super Sugar	8454	0.77	90
Ward Seed	Super Sugar DM	7468	0.80	84
Ward Seed	Sweet Forever BMR	8476	0.81	88
Ward Seed	Sweet Six BMR	7598	0.79	104
Sudan				
Croplan	Greentreat Rocket	5223	0.82	64
	Average	7222	0.81	79
	LSD (0.05)	2023		

Plant date: 6/10/16

Days to harvest: 61

Table 10b. Hay performance test near Scandia

		Forage quality													
Brand	Name	ADF	NDF	IVTDMD		NDFD		NDFn	NEG	NEL	NEM	NFC	Crude		
				@48hr	Lignin	@48hr	protein						RFQ	TDN	
----- % -----															
Forage sorghum															
Arrow Seed	Arrow EXP2	40.01	63.05	76.20	7.02	56.60	58.64	0.24	0.54	0.57	15.02	12.69	97.88	53.05	
KSU	Sumac	41.16	64.26	71.67	7.86	51.20	59.76	0.22	0.52	0.55	16.44	11.92	91.40	51.58	
KSU	Waconia	41.00	65.67	71.30	7.87	51.67	61.07	0.23	0.52	0.55	16.80	11.04	93.21	51.89	
Sharp Bros Seed	Canex	41.73	65.42	70.10	8.33	50.03	60.84	0.21	0.51	0.54	17.83	9.96	88.35	50.95	
Sharp Bros Seed	Canex BMR 600 w/ PO	42.20	65.60	74.70	7.79	55.57	61.01	0.22	0.51	0.54	14.79	10.52	88.78	51.17	
Star Seed	Drylander BMR	42.66	63.95	78.40	7.04	59.57	59.47	0.24	0.53	0.56	15.04	10.95	92.66	52.73	
Sorghum sudan															
Advanta Seeds	AS6401	42.55	64.55	76.07	7.53	57.63	60.03	0.23	0.52	0.55	14.24	11.44	89.78	52.02	
Advanta Seeds	AS6402	41.61	62.90	77.60	7.22	59.43	58.49	0.24	0.53	0.56	14.20	12.31	94.10	52.78	
Arrow Seed	1st Choice BMR	41.96	64.06	75.57	7.82	56.83	59.57	0.23	0.53	0.56	15.90	10.64	92.05	52.24	
Arrow Seed	Arrow EXP1	42.77	64.49	76.77	7.82	55.63	59.98	0.22	0.51	0.54	14.75	11.09	86.50	51.13	
Arrow Seed	Honey Graze V	42.90	64.29	73.03	8.12	52.33	59.79	0.20	0.51	0.53	15.20	11.49	83.12	50.35	
Croplan	Greentreat 1922	47.50	66.21	77.77	7.57	61.30	61.57	0.21	0.51	0.54	12.99	8.99	76.57	50.80	

continued

Table 10b. Hay performance test near Scandia

		Forage quality												
Brand	Name	ADF	NDF	IVTDMD		NDFD		NEG	NEL	NEM	NFC	Crude		
				@48hr	Lignin	@48hr	NDFn					protein	RFQ	TDN
----- % -----														
Sorghum sudan, continued														
Sharp Bros Seed	Grazex BMR 301	41.33	64.41	71.60	8.13	51.90	55.90	0.22	0.52	0.55	17.11	10.55	90.94	51.53
Sharp Bros Seed	Grazex BMR 801	45.20	67.54	68.20	8.91	49.13	62.81	0.19	0.49	0.51	16.93	7.93	73.95	48.87
Star Seed	Bruiser BMR	41.75	63.72	76.90	7.75	57.07	59.26	0.23	0.53	0.56	15.30	11.71	93.36	52.60
Star Seed	Nutrimax BMR	41.88	63.80	76.80	7.51	55.73	59.34	0.22	0.52	0.55	15.06	11.75	89.22	51.72
Star Seed	SSX1	42.14	63.79	76.73	7.41	56.50	59.33	0.23	0.52	0.55	16.11	10.60	91.11	52.02
Ward Seed	Nutri King BMR	41.42	64.62	72.73	7.57	54.53	60.10	0.22	0.52	0.55	14.61	11.68	89.52	51.35
Ward Seed	Super Sugar	40.91	63.26	70.70	8.26	50.70	58.84	0.21	0.51	0.54	17.86	10.44	89.30	51.02
Ward Seed	Super Sugar DM	42.03	64.54	72.57	7.95	51.67	60.02	0.21	0.51	0.54	15.55	11.52	87.06	50.59
Ward Seed	Sweet Forever BMR	39.70	64.24	76.10	7.55	56.43	59.74	0.24	0.54	0.57	15.34	12.03	98.72	53.05
Ward Seed	Sweet Six BMR	43.14	65.25	72.07	7.72	54.63	60.68	0.21	0.51	0.54	16.08	9.62	84.96	51.04
Sudan														
Croplan	Greentreat Rocket	43.36	63.07	77.07	7.24	57.07	58.66	0.21	0.51	0.54	13.31	12.50	83.79	50.91
	Average	42.21	64.46	74.38	7.74	54.92	59.95	0.22	0.52	0.55	15.50	11.02	88.97	51.54
	LSD (0.05)	4.03	3.72	3.12	0.96	3.19	3.46	0.04	0.03	0.04	2.37	2.98	15.19	2.79

Table 11. Silage performance across locations summary

Type	Performance	Forage quality													
	Yield	ADF	NDF	IVTDMD @48hr	Lignin	NDFD @48hr	NDFn	NEG	NEL	NEM	NFC	Crude protein	RFQ	TDN	Starch
	lb DM/a	----- % -----													
Forage sorghum BMR (64)*	12613	36.05	58.77	69.50	4.75	45.11	54.65	0.26	0.55	0.59	27.88	6.70	93.83	54.76	13.77
Forage sorghum Non-BMR (36)	14659	38.71	63.62	64.10	5.91	40.76	59.17	0.21	0.51	0.54	25.46	5.29	75.04	50.77	12.30

*Number in parenthesis is the number of variety*location entries across the state of Kansas.

Table 12a. Silage performance test near Garden City

Brand	Variety	Performance							
		Yield	Harvest moisture	Stand	Vigor	Flowering date	Days to harvest	Height	Lodging
		lb DM/a	%					in.	%
Advanta Seeds	AF7101	14170	0.71	8	9	8/11/16	91	152	0
Advanta Seeds	AF7102	14376	0.75	10	9	8/16/16	91	121	0
Advanta Seeds	AF7401	15120	0.74	9	9	9/6/16	113	125	0
Advanta Seeds	AF8301	17071	0.71	10	9	8/29/16	113	93	0
CERES, Inc.	F4C204	12915	0.75	9	9	8/11/16	91	86	0
CERES, Inc.	F4C207	11399	0.79	8	7	8/29/16	113	112	0
Chromatin	CHR12FS0012	15469	0.76	10	9	8/11/16	91	132	0
Chromatin	CHR14FB0240	14143	0.76	10	9	8/16/16	91	142	0
Chromatin	HiKane II	14668	0.77	10	9	8/11/16	91	123	0
Chromatin	NK300	18132	0.73	10	9	8/29/16	113	108	0
Chromatin	Red Top+BMT	12049	0.75	8	7	8/22/16	113	124	0
Chromatin	Sordan Headless	16171	0.78	10	9	NA	113	102	0
Chromatin	SP1615	17809	0.76	10	9	NA	113	85	0
Chromatin	SP1880	19340	0.74	9	9	9/13/16	113	100	0
Chromatin	SP2774BMR	12505	0.77	9	8	8/16/16	91	119	0
Chromatin	SP2876BMR	13572	0.77	9	9	8/16/16	91	98	0
Chromatin	SP3902BD	14759	0.77	9	9	9/6/16	113	131	0
Chromatin	SP3903BD	13158	0.77	9	8	9/6/16	113	96	0
Chromatin	SP4105BMR	12854	0.80	10	8	NA	113	125	0
Chromatin	SS304	18808	0.76	9	10	8/29/16	113	113	0
Chromatin	SS405	17715	0.72	10	10	9/6/16	113	96	0
Croplan	BMR 3411	13050	0.74	10	10	8/29/16	113	108	0
Croplan	BMR 3561	16220	0.78	10	9	8/16/16	91	123	0
KSU	Kansas Orange	14820	0.72	10	8	8/16/16	91	87	0
Monsanto	Nutri-Choice II	12834	0.74	10	9	8/29/16	113	119	0
Scott Seed Co	X50610	14736	0.76	9	8	9/6/16	113	85	0

continued

Table 12a. Silage performance test near Garden City

Brand	Variety	Performance							
		Yield	Harvest moisture	Stand	Vigor	Flowering date	Days to harvest	Height	Lodging
		lb DM/a	%					in.	%
Scott Seed Co	X5063	18,291	0.76	10	10	8/11/16	91	127	0
Scott Seed Co	X50711	14,937	0.75	9	9	9/6/16	113	80	0
Scott Seed Co	X50712	11,888	0.75	9	8	8/11/16	91	109	0
Scott Seed Co	X5129	18,336	0.79	10	9	NA	113	127	0
Scott Seed Co	X51410	15,168	0.76	9	9	9/6/16	113	102	0
Scott Seed Co	X51423	15,772	0.75	9	8	9/6/16	113	102	0
Scott Seed Co	X5143	14,176	0.75	9	8	8/11/16	91	117	0
Sharp Bros Seed	Canex BMR 540	16,856	0.74	9	8	9/6/16	113	114	0
Sharp Bros Seed	Canex BMR 550	15,719	0.76	9	9	9/6/16	113	93	0
Sharp Bros Seed	Canex 210	14,275	0.75	9	8	8/16/16	91	138	0
Sharp Bros Seed	Silex BMR 503	13,860	0.75	8	7	9/6/16	113	92	0
Star Seed	Magnum Ultra BMR	15,671	0.77	9	9	9/13/16	113	127	0
Sudax	BMR 331	15,763	0.73	9	9	9/6/16	113	80	0
Sudax	Exp 1601	15,813	0.76	9	9	8/16/16	91	109	0
Walter Moss Seed	4EVERgreen	17,189	0.79	10	9	NA	113	127	0
Ward Seed	EXP: 10216	14,393	0.73	10	9	8/11/16	91	102	0
Ward Seed	GW 400 BMR	18,451	0.76	9	8	8/11/16	91	102	0
Ward Seed	GW 600 BMR	14,994	0.68	10	10	8/16/16	113	117	0
Ward Seed	GW-2120	14,133	0.77	10	9	8/16/16	91	114	0
Ward Seed	Silo Pro BMR	14,080	0.77	10	10	9/6/16	113	93	0
Croplan	3701	14,274	0.73	9	8	9/6/16	113	138	0
Croplan	BMR 3631	13,761	0.76	10	9	9/6/16	113	92	0
Average		15,118	0.75	9	9	-	105	111	0
LSD (0.05)		3,091	-	-	-	-	-	-	-

Planting Date: 6/6/16

Emergence Date: 6/15/16

Table 12b. Silage performance test near Garden City

Brand	Variety	Forage quality											
		ADF	NDF	IVTDMD	Lignin	NDFD	NDFn	NEL	NFC	Crude protein	RFQ	TDN	Starch
				@48hr		@48hr							
----- % -----													
Advanta Seeds	AF7101	34.88	56.40	71.20	4.19	43.73	52.45	0.54	28.52	7.20	94.32	53.91	17.20
Advanta Seeds	AF7102	34.57	56.61	70.10	4.60	41.77	52.65	0.54	30.22	5.59	84.25	53.68	22.13
Advanta Seeds	AF7401	34.98	58.03	70.47	4.49	48.43	53.97	0.57	27.40	6.94	99.36	55.84	9.27
Advanta Seeds	AF8301	37.53	62.84	64.30	5.42	41.67	58.44	0.51	24.15	6.12	79.43	50.75	7.83
CERES, Inc.	F4C204	33.50	56.04	70.00	4.71	41.07	52.12	0.56	31.91	5.92	89.20	54.82	22.10
CERES, Inc.	F4C207	33.67	60.09	67.03	4.94	44.97	55.89	0.54	26.02	7.12	91.86	53.85	7.83
Chromatin	CHR12FS0012	35.64	58.77	68.53	5.21	42.17	54.65	0.54	28.24	6.54	88.91	53.24	17.90
Chromatin	CHR14FB0240	36.33	58.44	70.73	4.83	45.97	54.35	0.55	27.78	6.91	94.90	54.46	16.70
Chromatin	HiKane II	36.09	59.92	67.20	5.44	41.90	55.73	0.53	27.65	6.14	85.09	52.73	16.70
Chromatin	NK300	37.55	61.82	64.33	5.52	41.43	57.49	0.52	25.45	5.73	79.23	51.38	8.43
Chromatin	Red Top+BMT	33.18	57.57	68.57	4.45	46.70	53.54	0.57	30.22	5.76	93.09	56.35	10.47
Chromatin	Sordan Headless	43.83	71.85	58.30	6.82	40.60	66.82	0.45	18.08	4.73	57.51	44.95	3.07
Chromatin	SP1615	43.31	72.18	58.13	6.69	41.83	67.13	0.45	17.66	4.66	58.78	45.67	1.83
Chromatin	SP1880	40.82	69.40	58.93	6.55	40.13	64.54	0.47	20.76	4.79	63.44	47.11	7.11
Chromatin	SP2774BMR	37.82	61.44	68.50	5.40	46.50	57.14	0.53	23.90	7.62	91.42	52.54	10.93
Chromatin	SP2876BMR	38.46	62.46	67.57	5.44	44.60	58.08	0.52	24.08	6.99	86.14	51.74	12.97
Chromatin	SP3902BD	33.48	58.84	69.03	4.12	49.40	54.72	0.57	25.84	7.84	103.96	56.04	6.70
Chromatin	SP3903BD	36.47	61.03	69.23	4.12	48.73	56.76	0.54	22.76	8.42	97.98	53.63	5.47
Chromatin	SP4105BMR	39.97	64.87	68.47	4.83	49.77	60.33	0.51	18.49	8.50	86.89	50.58	1.83
Chromatin	SS304	34.70	61.25	65.37	5.21	42.63	56.96	0.54	28.78	4.55	76.78	53.59	11.23
Chromatin	SS405	39.84	67.69	60.27	6.21	39.70	62.95	0.48	22.98	4.83	66.57	48.21	11.23
Croplan	BMR 3411	32.51	58.07	69.13	3.92	46.33	54.00	0.56	28.73	6.53	94.94	55.65	10.37
Croplan	BMR 3561	34.60	58.94	72.27	3.77	50.87	54.81	0.57	25.98	8.26	106.26	56.02	10.73
KSU	Kansas Orange	37.36	62.81	64.90	5.63	41.33	58.42	0.52	25.50	5.89	79.64	51.26	12.53
Monsanto	Nutri-Choice II	38.32	63.91	62.33	6.20	40.57	59.44	0.51	24.70	5.23	73.67	50.45	7.87
Scott Seed Co	X50610	37.62	62.02	68.57	4.52	48.80	57.68	0.54	22.66	7.49	93.81	53.48	4.53

continued

Table 12b. Silage performance test near Garden City

		Forage quality											
Brand	Variety	IVTDMD				NDFD			Crude				
		ADF	NDF	@48hr	Lignin	@48hr	NDFn	NEL	NFC	protein	RFQ	TDN	Starch
----- % -----													
Scott Seed Co	X5063	33.88	57.22	71.63	4.26	46.60	53.21	0.56	28.41	7.56	100.93	55.61	15.23
Scott Seed Co	X50711	35.97	60.54	65.67	5.21	40.60	56.31	0.52	28.36	4.81	74.94	51.96	13.23
Scott Seed Co	X50712	37.00	58.50	67.97	5.17	40.40	54.41	0.53	28.80	5.85	83.48	52.60	19.50
Scott Seed Co	X5129	41.93	69.81	60.10	6.57	42.27	64.92	0.47	18.55	5.81	66.63	46.83	4.10
Scott Seed Co	X51410	33.94	58.60	68.93	4.16	48.70	54.50	0.57	25.93	7.89	103.70	55.81	7.13
Scott Seed Co	X51423	32.90	57.88	69.93	4.06	46.90	53.83	0.56	28.06	7.18	98.05	55.37	10.63
Scott Seed Co	X5143	32.83	56.42	71.93	4.35	46.13	52.47	0.57	29.03	7.93	104.75	56.06	17.13
Sharp Bros Seed	Canex BMR 540	35.42	59.36	68.73	4.99	44.33	55.21	0.55	27.39	6.58	91.05	53.94	12.73
Sharp Bros Seed	Canex BMR 550	33.70	57.58	70.17	3.93	48.10	53.55	0.56	26.74	7.89	102.53	55.42	8.37
Sharp Bros Seed	Canex 210	35.76	60.38	68.13	5.06	44.87	56.16	0.55	27.73	6.47	92.52	54.45	16.33
Sharp Bros Seed	Silex BMR 503	34.77	57.79	70.77	4.13	47.30	53.74	0.55	26.56	7.45	97.75	54.70	10.27
Star Seed	Magnum Ultra BMR	35.68	61.54	68.10	4.74	47.50	57.23	0.55	26.80	5.68	88.62	54.75	8.19
Sudax	BMR 331	36.56	61.29	68.77	4.06	49.27	57.00	0.54	22.68	8.06	97.39	53.73	2.70
Sudax	Exp 1601	35.95	58.27	70.60	4.83	46.20	54.19	0.55	27.57	6.92	94.75	54.42	14.50
Walter Moss Seed	4EVERgreen	41.05	69.17	61.03	5.94	43.17	64.33	0.48	20.01	5.60	69.91	48.27	4.73
Ward Seed	EXP: 10216	34.84	56.80	71.80	4.04	44.63	52.82	0.55	28.61	6.96	94.32	54.27	16.97
Ward Seed	GW 400 BMR	32.72	55.10	73.47	3.98	47.20	51.24	0.57	30.37	7.08	101.26	56.40	16.50
Ward Seed	GW 600 BMR	35.64	60.73	66.97	4.34	43.87	56.48	0.54	27.87	5.07	81.38	53.71	11.10
Ward Seed	GW-2120	35.22	59.39	68.30	5.18	42.53	55.23	0.53	27.23	6.48	87.02	52.84	15.17
Ward Seed	Silo Pro BMR	34.70	58.79	69.10	4.36	49.67	54.68	0.56	24.06	8.89	104.34	54.83	5.40
Croplan	3701	40.02	66.15	60.87	7.15	37.20	61.52	0.48	26.24	3.22	57.27	48.24	16.10
Croplan	BMR 3631	34.24	53.68	71.37	4.18	40.50	49.92	0.58	36.54	4.04	83.26	57.01	29.27
Average		36.29	60.80	67.45	4.96	44.57	56.54	0.53	26.08	6.45	87.36	52.98	11.46
LSD (0.05)		2.53	3.48	2.73	0.71	2.86	3.24	0.02	3.03	1.29	10.66	2.18	4.49

Table 13a. Silage performance test near Hays

Brand	Variety	Performance							
		Yield	Harvest moisture	Stand	Vigor	Flowering date	Days to harvest	Height	Lodging
		lb DM/a	%					in.	%
Advanta Seeds	AF7101	11,334	0.67	9	9	7/25/16	91	82	0
Advanta Seeds	AF7102	15,196	0.67	9	10	7/28/16	91	68	0
Advanta Seeds	AF7401	12,681	0.73	9	9	9/4/16	115	70	0
Advanta Seeds	AF8301	13,253	0.69	8	8	8/22/16	115	73	0
Arrow Seed	SiloMor II	15,809	0.71	9	10	9/3/16	115	81	0
Arrow Seed	SiloMor II BMR	10,570	0.70	9	9	8/16/16	115	73	0
CERES, Inc.	F4C204	14,918	0.67	9	9	7/24/16	91	81	0
KSU	KS Orange	11,943	0.69	7	8	8/12/17	91	99	18
Scott Seed Co	X5063	9,198	0.68	4	4	7/26/16	91	73	0
Scott Seed Co	X50712	6,187	0.67	4	5	8/2/16	91	71	0
Scott Seed Co	X5129	10,945	0.73	5	5	NA	129	99	0
Scott Seed Co	X51423	12,522	0.76	8	8	8/27/16	115	106	0
Scott Seed Co	X5143	13,196	0.69	8	9	8/2/16	91	93	0
Sharp Bros Seed	Canex BMR 210	12,772	0.70	9	9	8/12/16	107	89	0
Sharp Bros Seed	Canex BMR 600 w/ PO	12,321	0.71	8	9	NA	129	101	25
Star Seed	Magnum Ultra BMR	13,130	0.73	9	9	9/16/16	129	101	0
Ward Seed	EXP: 10216	12,200	0.69	8	8	7/29/16	91	84	0
Ward Seed	GW 400 BMR	14,390	0.69	9	9	7/28/16	91	80	22
Ward Seed	GW 600 BMR	17,102	0.69	8	8	8/12/16	107	96	0
Ward Seed	Silo Pro BMR	9,495	0.74	9	9	9/16/16	129	82	0
Croplan	3701	16,636	0.70	9	9	9/20/16	129	108	22
Croplan	BMR 3631	11,279	0.72	8	8	9/20/16	129	79	0
Average		12,594	0.70	8	8	*	108	86	4
LSD (0.05)		3,275	-	-	-	-	-	-	-

Planting Date: 6/7/16

Emergence Date: 6/13/16

Table 13b. Silage performance test near Hays

Brand	Variety	Forage quality												
		ADF	NDF	IVTDMD		Lignin	NDFD		NDFn	NEL	NFC	Crude		Starch
				@48hr			@48hr					protein	RFQ	
----- % -----														
Advanta Seeds	AF7101	31.20	43.35	74.80	5.04	34.03	40.32	0.63	45.43	6.52	115.77	61.33	44.60	
Advanta Seeds	AF7102	32.41	47.94	73.70	5.08	37.20	44.59	0.60	39.77	5.75	99.59	58.52	32.80	
Advanta Seeds	AF7401	37.64	59.33	69.60	5.06	43.03	55.18	0.55	29.79	4.30	78.35	54.19	15.67	
Advanta Seeds	AF8301	38.25	58.58	66.50	5.96	35.20	54.48	0.52	32.10	3.11	62.98	51.43	24.90	
Arrow Seed	SiloMor II	39.23	59.17	66.63	6.24	36.57	55.03	0.52	32.00	2.78	60.99	51.33	25.23	
Arrow Seed	SiloMor II BMR	37.80	58.25	68.70	5.69	40.77	54.18	0.55	33.16	3.11	72.06	54.81	24.90	
CERES, Inc.	F4C204	34.23	52.66	71.57	5.45	40.97	48.97	0.59	35.86	6.28	103.53	58.00	21.57	
KSU	Kansas Orange	38.19	59.96	66.52	6.08	40.70	55.77	0.54	29.61	5.77	86.98	53.85	17.27	
Scott Seed Co	X5063	33.34	48.57	72.80	5.63	35.33	45.17	0.58	37.75	6.94	101.29	56.88	31.57	
Scott Seed Co	X50712	34.77	51.91	71.23	5.09	36.90	48.28	0.58	37.00	5.97	93.35	56.72	33.70	
Scott Seed Co	X5129	38.92	63.54	66.30	6.04	45.20	59.09	0.53	26.42	5.03	78.84	52.55	11.37	
Scott Seed Co	X51423	35.14	55.69	74.97	4.48	47.80	51.79	0.59	31.94	6.72	106.65	58.03	12.67	
Scott Seed Co	X5143	32.30	50.72	74.17	4.63	42.77	47.17	0.61	36.46	7.28	113.68	59.39	25.47	
Sharp Bros Seed	Canex BMR 210	35.89	54.57	71.60	5.27	42.24	50.75	0.58	34.24	6.01	100.05	57.25	25.90	
Sharp Bros Seed	Canex BMR 600 w/ PO	37.53	60.70	68.77	5.24	45.67	56.45	0.56	29.29	5.76	91.84	55.38	15.37	
Star Seed	Magnum Ultra BMR	38.34	62.90	69.00	5.25	48.90	58.50	0.56	26.58	6.45	95.75	55.41	11.20	
Ward Seed	EXP: 10216	35.67	53.40	71.60	5.40	41.40	49.66	0.56	32.44	6.63	94.50	55.07	21.60	
Ward Seed	GW 400 BMR	33.19	49.82	74.00	5.15	40.93	46.33	0.60	38.57	5.57	101.92	59.12	29.37	
Ward Seed	GW 600 BMR	35.43	52.68	71.77	5.65	39.20	49.00	0.57	36.09	5.55	93.96	56.58	28.50	
Ward Seed	Silo Pro BMR	35.39	54.21	71.07	4.38	40.37	50.42	0.57	34.95	4.57	84.49	55.99	27.97	
Croplan	3701	41.72	66.15	60.87	7.15	37.20	61.52	0.48	26.24	3.22	57.27	48.24	16.10	
Croplan	BMR 3631	34.41	53.68	71.37	4.18	40.50	49.92	0.58	36.54	4.04	83.26	57.01	29.27	
Average		35.95	55.35	70.34	5.37	40.59	51.48	0.57	33.74	5.34	89.87	55.78	23.95	
LSD (0.05)		3.11	6.28	3.22	0.63	5.66	5.84	0.04	7.51	1.68	14.28	3.68	12.13	

Planting Date: 6/7/16

Emergence Date: 6/13/16

Table 14. Silage performance test near Hutchinson

Brand	Variety	Performance							
		Yield	Harvest moisture	Stand	Vigor	Flowering date	Days to harvest	Height	Lodging
		lb DM/a	%					in.	%
KSU	Kansas Orange	10,371	0.58	8	*	*	127	75	0
Advanta Seeds	AF7401	8,708	0.70	7	*	*	127	69	73
Advanta Seeds	AF7101	5,897	0.69	8	*	*	94	90	23
Advanta Seeds	AF8301	10,252	0.60	5	*	*	127	87	73
Advanta Seeds	AF7102	7,059	0.72	9	*	*	94	65	17
Average		8,458	0.66	7.35	*	*	114	77	37
LSD (0.05)		2,443	-	-	-	-	-	-	-

Planting Date: 6/10/16

Emergence Date: 6/15/16

Table 15a. Silage performance test near Mound Valley

Brand	Variety	Performance							
		Yield	Harvest moisture	Stand	Vigor	Flowering date	Days to harvest	Height	Lodging
		lb DM/a	%					in.	%
Advanta Seeds	AF7101	9,071	0.74	10	*	8/2/16	77	74	10
Advanta Seeds	AF7102	10,640	0.78	10	*	8/8/16	82	59	4
Advanta Seeds	AF7401	14,433	0.76	10	*	9/11/16	117	58	3
Advanta Seeds	AF8301	16,633	0.73	10	*	8/29/16	109	70	0
KSU	Kansas Orange	8,849	0.72	7	*	8/19/16	90	96	34
Ward Seed	EXP: 10216	8,567	0.75	10	*	8/8/16	84	80	10
Ward Seed	GW 400 BMR	6,985	0.82	5	*	8/11/16	84	78	26
Ward Seed	GW 600 BMR	9,552	0.72	7	*	8/19/16	90	87	25
Ward Seed	Silo Pro BMR	10,111	0.77	10	*	10/4/16	117	61	2
Average		10,538	0.75	9	*	-	94	74	13
LSD (0.05)		1,170	-	-	-	-	-	-	-

Planting Date: 6/9/16
Emergence Date: 6/15/16
*Starch content was low due to little or no grain production.

Table 15b. Silage performance test near Mound Valley

Brand	Variety	Forage quality											
		ADF	NDF	IVTDMD	Lignin	NDFD	NDFn	NEL	NFC	Crude protein	RFQ	TDN	Starch*
				@48hr		@48hr							
----- % -----													
Advanta Seeds	AF7101	40.10	65.89	66.85	5.06	48.43	61.28	0.54	21.11	7.24	90.93	53.19	2.10
Advanta Seeds	AF7102	37.42	60.25	68.56	5.26	45.87	56.03	0.57	27.57	6.76	99.59	56.07	12.37
Advanta Seeds	AF7401	35.17	59.17	70.33	5.27	49.27	55.03	0.56	25.38	8.69	106.96	55.70	5.63
Advanta Seeds	AF8301	37.02	63.07	64.67	6.55	43.30	58.66	0.54	26.24	5.99	85.75	53.11	7.60
KSU	Kansas Orange	41.94	70.96	55.17	6.87	39.23	65.99	0.49	20.89	5.16	69.53	49.14	1.33
Ward Seed	EXP: 10216	38.80	65.10	63.42	4.53	46.37	60.54	0.54	21.20	7.42	92.38	53.15	0.80
Ward Seed	GW 400 BMR	39.35	66.59	60.90	5.38	43.67	61.93	0.51	19.97	6.83	81.89	50.59	0.77
Ward Seed	GW 600 BMR	39.46	65.34	62.60	5.41	44.73	60.77	0.51	19.92	7.38	85.00	50.97	0.53
Ward Seed	Silo Pro BMR	37.93	64.05	64.53	5.35	46.97	59.56	0.53	21.15	8.34	94.19	52.66	0.00
Average		38.58	64.49	64.11	5.52	45.31	59.98	0.53	22.60	7.09	89.58	52.73	3.46
LSD (0.05)		2.42	3.73	2.72	0.94	2.88	3.47	0.03	2.91	1.19	10.01	2.52	3.09

Planting Date: 6/9/16

Emergence Date: 6/15/16

*Starch content was low due to little or no grain production.

Table 16a. Silage performance test near Scandia

Brand	Variety	Performance							
		Yield	Harvest moisture	Stand	Vigor	Flowering date	Days to harvest	Height	Lodging
		lb DM/a	%					in.	%
Advanta Seeds	AF7101	8,543	0.64	10	10	*	103	81	90
Advanta Seeds	AF7102	12,214	0.73	10	10	*	103	77	88
Advanta Seeds	AF7401	12,172	0.62	10	10	*	158	75	0
Advanta Seeds	AF8301	15,510	0.73	10	10	*	103	86	3
Arrow Seed	SiloMor II	10,656	0.69	10	10	*	158	74	47
Arrow Seed	SiloMor II BMR	11,218	0.62	10	10	*	158	72	23
CERES, Inc.	F4C204	9,071	0.75	10	10	*	103	90	82
KSU	Kansas Orange	14,234	0.68	8	10	*	103	98	22
Star Seed	Magnum Ultra BMR	10,804	0.73	10	10	*	158	92	47
Ward Seed	EXP: 10216	11,438	0.67	10	10	*	103	88	20
Ward Seed	GW 400 BMR	10,216	0.73	10	10	*	103	71	87
Ward Seed	GW 600 BMR	11,694	0.67	10	10	*	103	100	30
Ward Seed	GW-2120	11,103	0.69	10	10	*	103	85	73
Ward Seed	Silo Pro BMR	12,114	0.75	10	10	*	103	82	0
Croplan	3701	20,603	0.64	9	10	*	158	143	0
Croplan	BMR 3631	13,507	0.65	10	10	*	158	85	0
Average		12,194	0.69	10	10	*	124	87	38
LSD (0.05)		2,984	-	-	-	-	-	-	-

Planting Date: 6/9/16

Emergence Date: 6/15/16

Table 16b. Silage performance test near Scandia

Brand	Variety	Forage quality											
		ADF	NDF	IVTDMD	Lignin	NDFD	NDFn	NEL	NFC	Crude protein	RFQ	TDN	Starch
				@48hr		@48hr							
----- % -----													
Advanta Seeds	AF7101	38.02	60.18	69.20	4.58	44.70	55.96	0.55	26.19	6.18	89.21	53.98	13.80
Advanta Seeds	AF7102	37.99	61.96	69.37	4.75	46.47	57.62	0.55	25.44	6.52	93.12	54.53	13.77
Advanta Seeds	AF7401	38.03	59.73	69.13	4.50	43.10	55.55	0.55	28.15	5.37	85.26	54.01	15.73
Advanta Seeds	AF8301	40.50	64.37	65.40	5.96	40.53	59.86	0.51	24.37	5.21	73.54	50.36	13.93
Arrow Seed	SiloMor II	44.73	71.48	60.57	6.38	40.83	66.48	0.45	16.12	6.00	62.46	45.58	1.50
Arrow Seed	SiloMor II BMR	40.04	64.35	65.73	5.40	42.67	59.85	0.53	25.24	4.99	77.23	52.19	10.47
CERES, Inc.	F4C204	41.01	65.21	65.13	5.50	40.50	60.65	0.50	23.56	4.90	70.54	49.91	13.60
KSU	Kansas Orange	40.07	66.09	63.57	6.30	41.20	61.47	0.50	21.97	6.50	79.09	49.84	9.87
Star Seed	Magnum Ultra BMR	40.20	65.36	66.50	6.05	45.87	60.79	0.53	22.40	6.12	83.00	52.23	5.27
Ward Seed	EXP: 10216	39.00	63.25	66.50	5.35	43.43	58.82	0.52	24.89	5.92	82.71	52.11	14.13
Ward Seed	GW 400 BMR	37.60	59.44	68.30	5.09	41.23	55.28	0.54	27.70	5.64	83.81	53.03	15.83
Ward Seed	GW 600 BMR	38.11	59.84	69.57	4.65	42.27	55.65	0.53	27.15	5.66	82.08	52.75	14.47
Ward Seed	GW-2120	39.38	63.69	64.07	5.95	38.63	59.23	0.51	26.12	4.59	71.82	50.96	15.07
Ward Seed	Silo Pro BMR	37.61	62.93	69.77	4.54	48.40	58.53	0.54	22.15	7.69	93.16	53.05	7.70
Croplan	3701	42.69	72.29	58.47	6.62	40.37	67.23	0.47	20.25	3.60	56.52	46.99	8.93
Croplan	BMR 3631	39.92	64.22	68.17	4.65	46.37	59.72	0.53	23.17	6.20	85.15	52.91	7.63
Average		39.68	64.02	66.21	5.39	42.91	59.54	0.52	24.05	5.69	79.29	51.53	11.36
LSD (0.05)		3.89	6.24	4.25	0.94	3.40	5.80	0.05	6.41	1.60	14.93	4.41	7.71

Planting Date: 6/9/16
Emergence Date: 6/15/16

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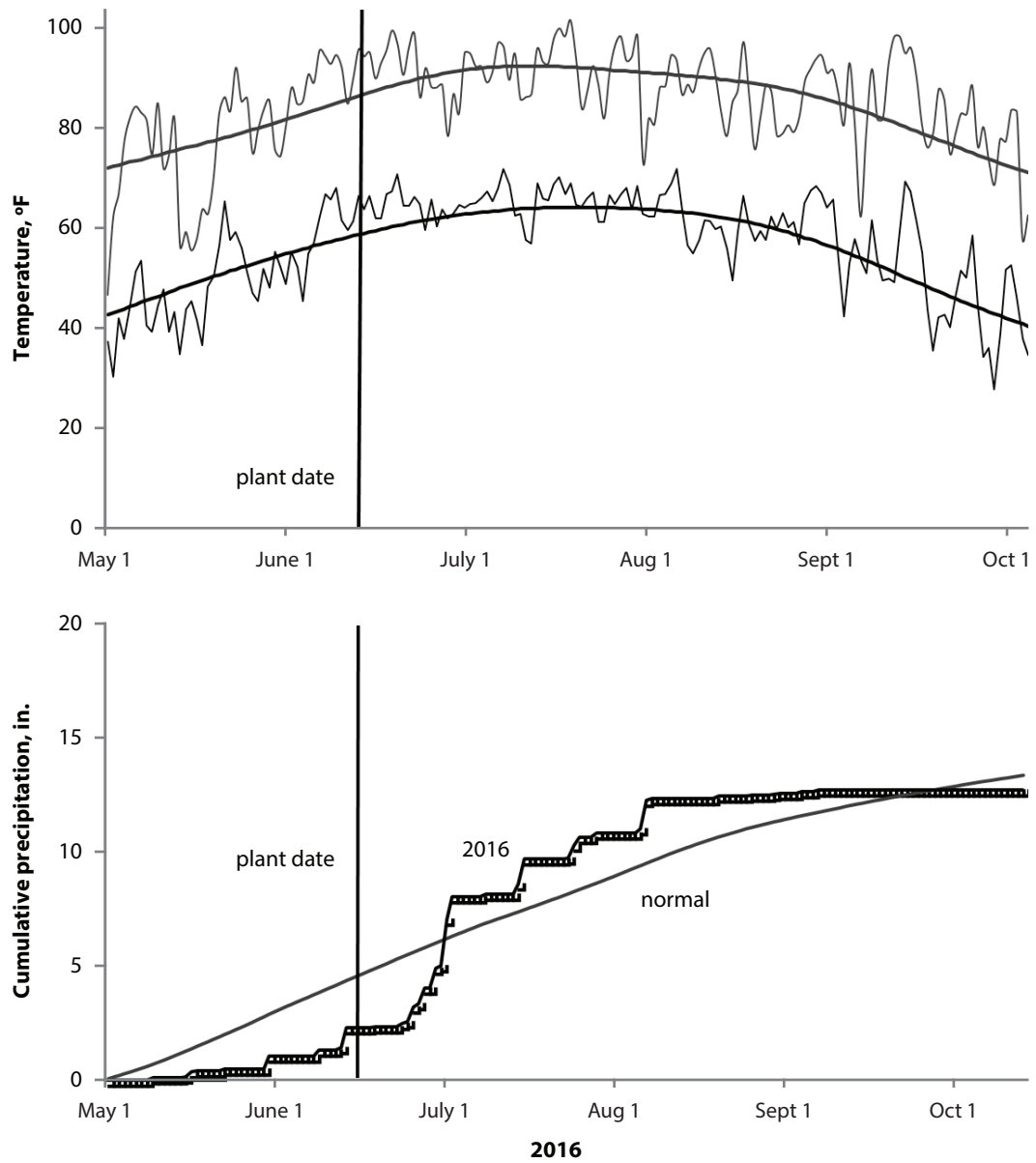


Figure 1. Precipitation and temperature during the growing season near Garden City, KS. Top pane: daily and mean (1981 to 2010) high and low temperature. Bottom pane: daily and mean (1981 to 2010) cumulative precipitation.

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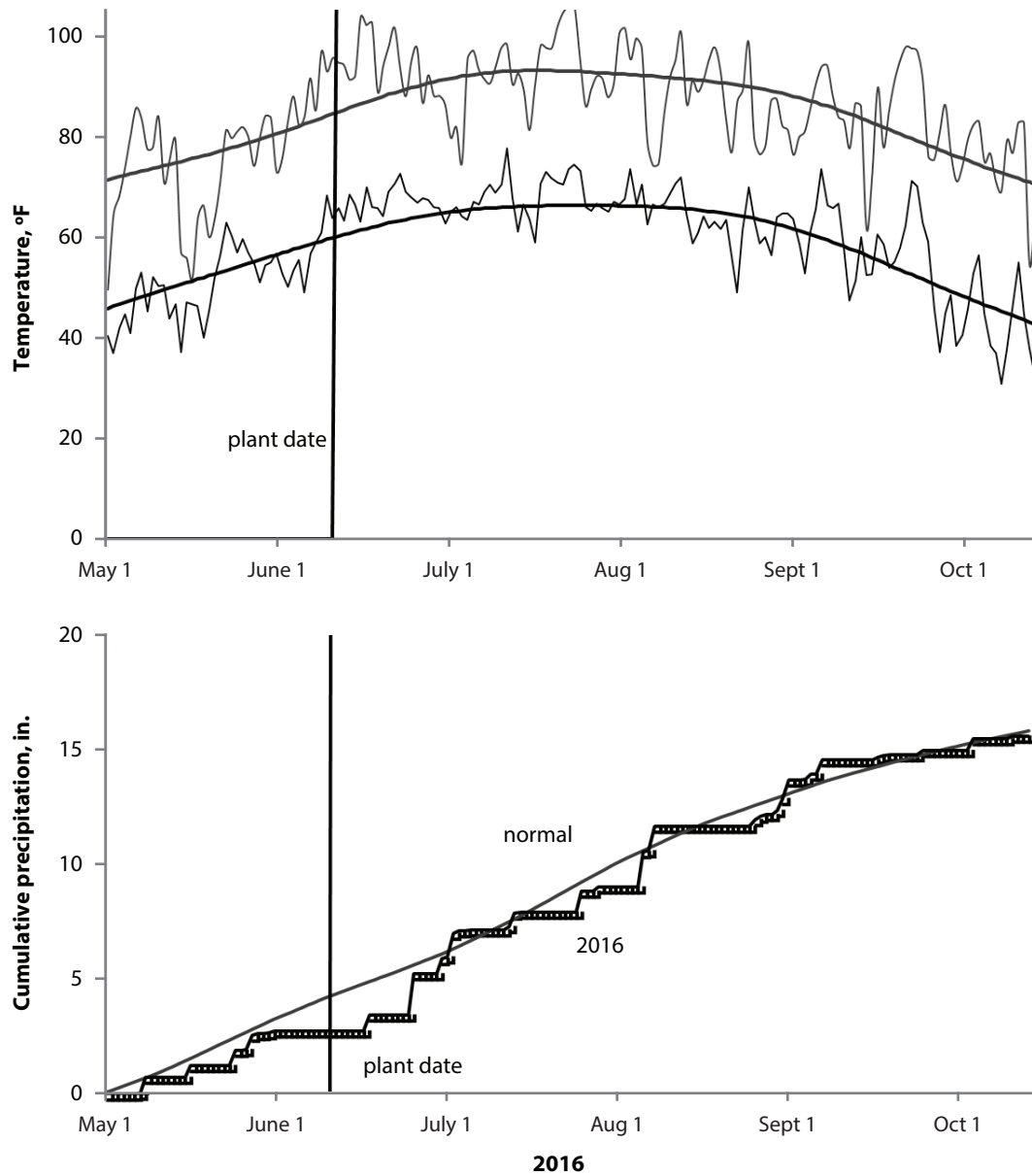


Figure 2. Precipitation and temperature during the growing season near Hays, KS. Top pane: daily and mean (1981 to 2010) high and low temperature. Bottom pane: daily and mean (1981 to 2010) cumulative precipitation.

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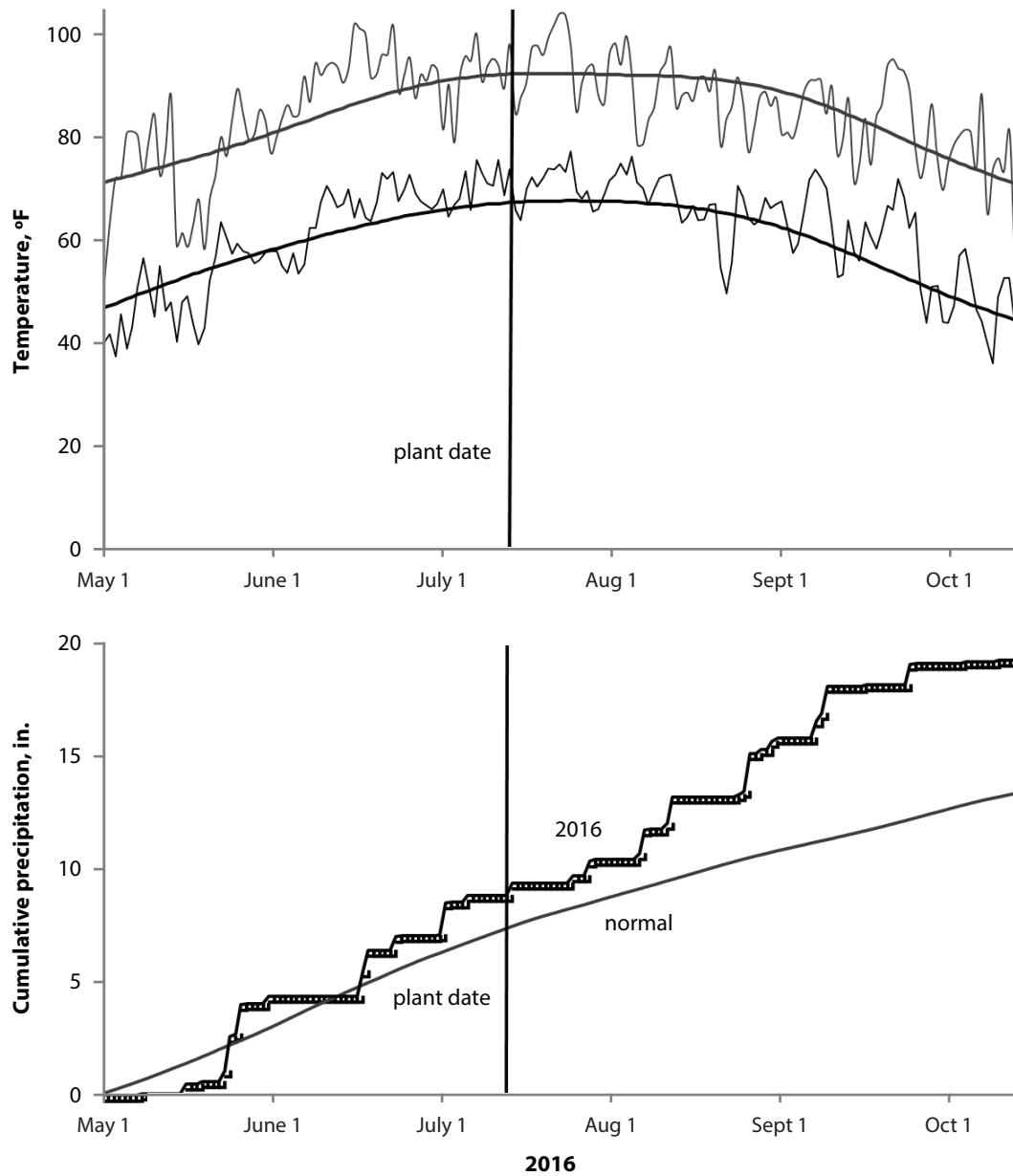


Figure 3. Precipitation and temperature during the growing season near Hutchinson, KS. Top pane: daily and mean (1981 to 2010) high and low temperature. Bottom pane: daily and mean (1981 to 2010) cumulative precipitation.

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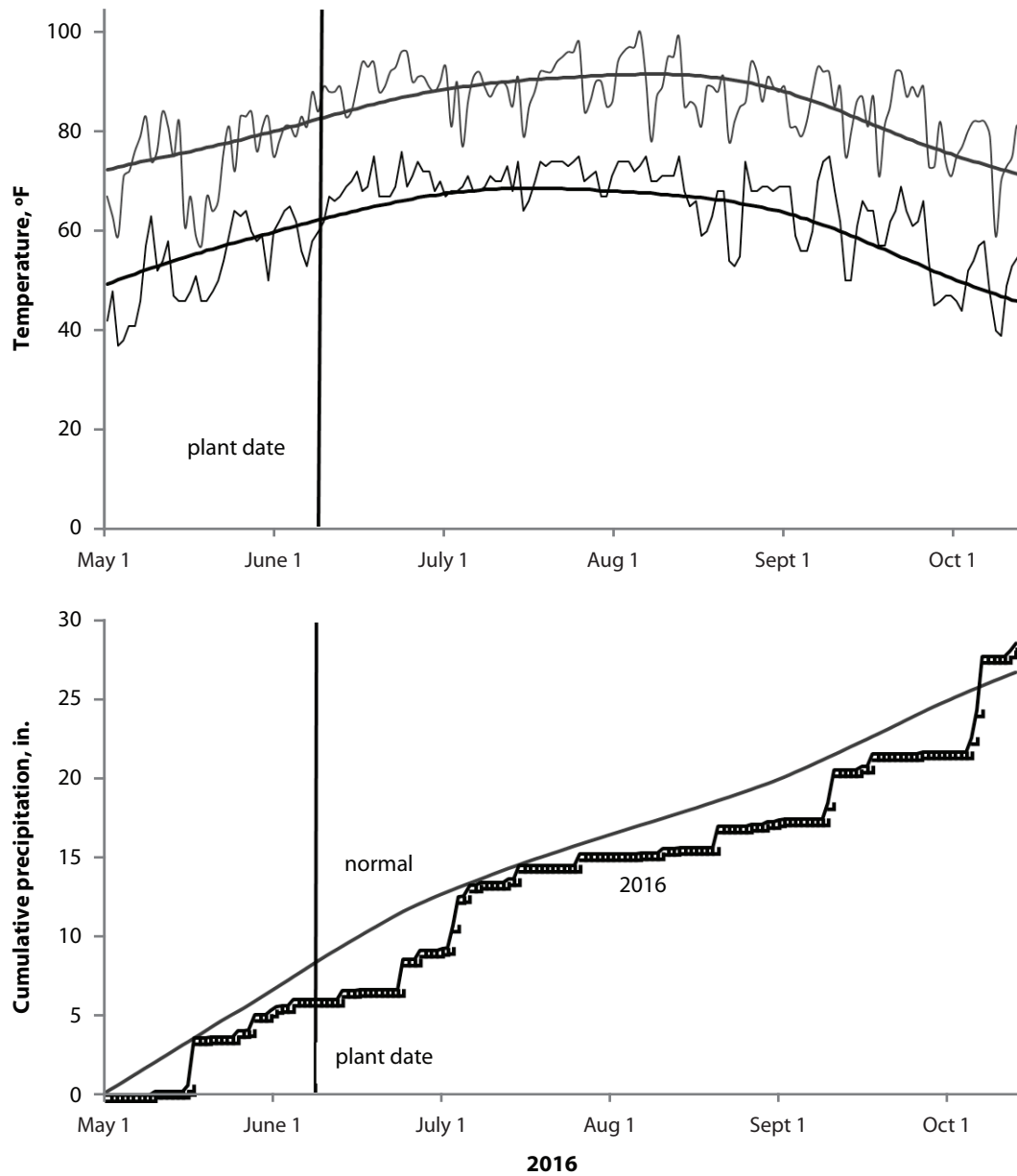


Figure 4. Precipitation and temperature during the growing season near Mound Valley, KS. Top pane: daily and mean (1981 to 2010) high and low temperature. Bottom pane: daily and mean (1981 to 2010) cumulative precipitation.

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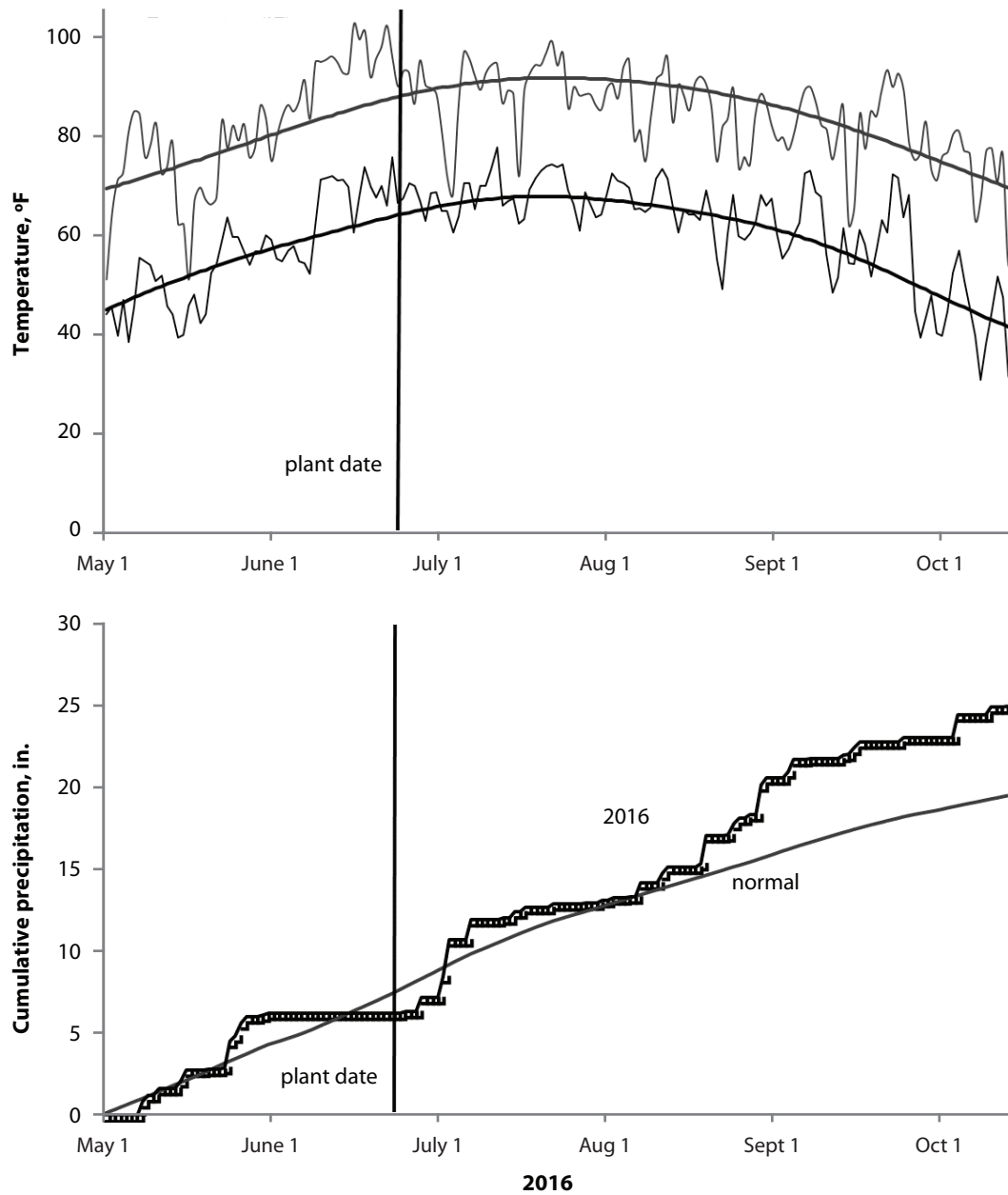


Figure 5. Precipitation and temperature during the growing season near Scandia, KS. Top pane: daily and mean (1981 to 2010) high and low temperature. Bottom pane: daily and mean (1981 to 2010) cumulative precipitation.

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