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2019 Kansas Summer Annual Forage Hay and Silage Variety Trial

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2019 Kansas Summer Annual Forage Hay and Silage Variety Trial

Abstract

In 2019, summer annual forage variety trials were conducted across Kansas near Garden City, Hays, 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 95 hay varieties, 99 sorghum silage varieties, and 12 corn silage varieties were evaluated.

Keywords

forage, hay, sorghum silage, corn silage

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Cover Page Footnote

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Authors

J. D. Holman, A. K. Obour, J. Lingenfelter, T. Roberts, and S. Maxwell



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K-STATE
Research and Extension

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

2019 Kansas Summer Annual Forage Hay and Silage Variety Trial

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Summary

In 2019, summer annual forage variety trials were conducted across Kansas near Garden City, Hays, 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 95 hay varieties, 99 sorghum silage varieties, and 12 corn silage varieties were evaluated.

Introduction

Annually there are approximately 35,000,000 acres of hay and haylage harvested in the U.S. for a total of 96,000,000 dry matter tons of production. Yields in Kansas averaged 2.77 tons of dry matter per acre. Of this total, about 13,600,000 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 2,400,000 acres of hay and haylage harvested with an average yield of 2.24 dry matter tons per acre. 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 ranked 6th in the U.S. for hay and haylage production. This largely supports the state dairy (ranked 19th in the U.S. and valued at \$483,000,000) and cattle (feedlot, background, and cow/calf) industries (ranked second in the U.S. and valued at \$10,200,000,000). Dairy and beef cattle represented 58% of the total agricultural product of Kansas. Hay and grain commodities that support these two industries are critical for the state.

Study Objectives

The objectives of the Kansas Summer Annual Forage Hay and Silage 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 Trial is planted at locations across Kansas based on the interest of those entering varieties into the test.

Procedures

In 2019, the Summer Annual Forage Variety Test was conducted near Garden City, Hays, and Scandia, KS. 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 40 entries at Garden City, 28 at Hays, and 27 at Scandia. In the silage test, there were 38 sorghum and 6 corn entries at Garden City, 26 sorghum and 6 corn at Hays, and 35 sorghum at Scandia (Table 1). Across the sites, a total of 95 hay varieties, 99 sorghum silage, and 6 corn silage varieties were evaluated. Information on the varieties is shown in Tables 2, 3, and 4.

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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 5), growing season temperature, and precipitation (Figures 1, 2, and 3) 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 Sevitech Laboratories in Dodge City, KS. Nutrient contents measured were crude protein (CP), adjusted crude protein (Adj_CP), nitrogen free neutral detergent fiber (NDFn), acid detergent fiber (ADF), neutral detergent fiber organic matter basis (aNDFom), lignin, undigested aNDFom remaining after in vitro digestion at 240 hr (uNDFom240), neutral detergent fiber-digestible at 240 hr (NDFD240), water soluble carbohydrates (WSC), starch, total fatty acids (TFA), ash, calcium (Ca), phosphorus (P), magnesium (Mg), potassium (K), sulfur (S), non-fiber carbohydrates (NFC), total digestible nutrients using Ohio Agricultural Research and Development Center (OARDC) calculation (TDN_OARDC), net energy for lactation 3x intake using OARDC (NEL3x_OARDC), net energy for gain using OARDC (NEG_OARDC), net energy for maintenance using OARDC (NEM_OARDC), and relative feed value (RFV).

2019 Growing Conditions

Temperature and precipitation (Figures 1, 2, and 3) for each site is 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 (1980–2019), and the line labeled “2019” represents actual precipitation.

In general, the 2019 growing season saw near normal temperatures, and above average precipitation throughout the growing season. Precipitation was below average in the fall at Garden City only, but that site was irrigated, and moisture was not limiting.

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

At Garden City, Qualimax, Fullgraze II, Sordan Headless, Excel, Nutrimaxx II BMR, 19153, and 19154 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; F75FS13, ADV XS8007, Cadan PPS, Wondergreen, Surpass, 18178, 4047 were in the highest yielding LSD group. Combined across cuttings, Wondergreen, Qualimax, Fullgraze II, Fullgraze II BMR, Sordan Headless, Excel, Nutrimaxx II BMR, 18180, 18552, 19102, 19153, and 19154 were in the top LSD group.

At Hays, Nutrimaxx BMR, Cadan PPS, Danny Boy II BMR, Fullgraze II BMR, and 18181 had the greatest yield in the top LSD group in the first cutting (Table 7). There was no second cutting due to little regrowth and frost in early October.

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At Scandia, Fullgraze II BMR, Excel, 18180, and 19154 were in the top LSD group in the first cutting (Table 8). There was no second cutting due to little regrowth and frost in early October.

Sorghum Silage Test

At Garden City, ADV XF033, F72FS05, Super Sile 30, Top Ton, Packer, 19176, and 19179 were in the top LSD group for silage (Table 9).

At Hays, ADV XF025, ADV XF033, AF7401, F72FS05, Super Sile 20, Super Sile 30, TopTon, KS Orange, Opal, Packer, 19038, and 12875 were in the top LSD group for silage (Table 10).

At Scandia, 10766, AF7401, F74FS72 BMR, FX19125 BMR, Packer, 18096, 19040, and 19179 were in the top LSD group for silage (Table 11).

Corn Silage Test

Similar varieties were tested at Garden City and Hays and some minor differences occurred across locations for the varieties D58RR70 and D58VC65.

At Garden City, all the varieties were in the top LSD group except D58RR70, which yielded less (Table 12).

At Hays, all varieties were in the top LSD group except D58VC65, which yielded less (Table 13).

Recommendation

Inestimable differences in soil type, weather, and environmental conditions play a part in increasing experimental error, therefore, one should use more than one location and year to make an informed variety selection decision. Please refer to previous years' forage reports to see how a variety performed across years.

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 U.S.

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

Location	Hay	Sorghum silage	Corn silage
Garden City	40	38	6
Hays	28	26	6
Scandia	27	35	---
Total	95	99	12

Table 2. 2019 Hay entries

Company	Variety	Type	BMR	Dwarf	Male sterile	Dry stalk	Photo-period sensitive	Maturity	Greenbug resistance
Agrilead	Nutri Maxx BMR	SS	Y	N	Y	N	N	L	N
Agrilead	AL-Nutri Maxx BMR	SS	Y	N	Y	N	N	L	N
Alta Seeds	AS6401	SS	Y	N	N	N	N	ML	N
Alta Seeds	AS6402	SS	Y	Y	N	N	N	ML	N
Alta Seeds	ADV XS007	SS	Y	N	N	N	N	ML	N
Alta Seeds	ADV XS008	SS	Y	Y	N	N	N	ML	N
Alta Seeds	ADV XS8007	SS	Y	N	N	N	N	ML	N
Browning Seed	Cadan PPS	SS	N	N	N	N	Y	PPS	N
Browning Seed	Wondergreen	SS	N	N	N	Y	N	E	N
Browning Seed	Sweet Sioux BMR	SS	Y	N	N	N	N	M	N
Channel Seed	Qualimax	SS	N	N	N	N	N	ML	N/A
Coffey	Surpass	SS	Y	-	-	-	-	M	-
Coffey	5618	SS	Y	-	-	-	-	M	Y
Coffey	Xtragraze	SS	Y	-	-	-	-	M	-
Coffey	5619	SS	Y	-	-	-	-	M	Y
Coffey	Tifleaf	MT	N	-	-	-	-	M	-
Coffey	Leafy TR 9	MT	N	-	-	-	-	M	-
Coffey	Epic	MT	Y	-	-	-	-	M	-
Coffey	Leafy TR 7	MT	N	-	-	-	-	M	-
Dyna-Gro Seed	Danny Boy II BMR	SS	Y	N	N	N	Y	PPS	N
Dyna-Gro Seed	Super Sweet 10	SS	N	N	N	N	N	M	N
Dyna-Gro Seed	Fullgraze II	SS	N	N	N	N	N	MF	N
Dyna-Gro Seed	Fullgraze II BMR	SS	Y	N	N	N	N	MF	N
Dyna-Gro Seed	F75FS13	FS	N	N	N	N	N	M	N
Dyna-Gro Seed	PearlMil	MT	N	N	N	N	N	M	N
KSU (check)	Rox Orange	FS	N	N	N	N	N	M	N
KSU (check)	Early Sumac	FS	N	N	N	N	N	M	N
Sorghum Partners	SP4105 BMR	SS	Y	N	N	N	Y	PPS	NA
Sorghum Partners	SP4555 BMR	SS	Y	N	N	N	N	M	NA
Sorghum Partners	Sordan 79	SS	N	N	N	N	Y	M	NA

continued

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Table 2. 2019 Hay entries

Company	Variety	Type	BMR	Dwarf	Male sterile	Dry stalk	Photo-period sensitive	Maturity	Greenbug resistance
Sorghum Partners	Sordan Headless	SS	N	N	N	N	Y	PPS	NA
Star Seed	Bruiser BMR	SS	Y	N	N	N	N	ME	NA
Star Seed	Nutrimaxx II BMR	SS	Y	N	N	N	N	L	NA
Star Seed	Excel	SS	N	N	N	N	N	L	NA
Ward Seed	18178	SS	Y	N	N	N	N	E	Y
Ward Seed	18180	SS	N	N	N	N	N	L	Y
Ward Seed	18181	SS	Y	N	N	N	Y	PPS	Y
Ward Seed	18182	SS	Y	N	N	Y	N	E	Y
Ward Seed	18552	SS	N	N	N	Y	N	E	Y
Ward Seed	19102	SS	N	N	N	N	Y	PPS	Y
Ward Seed	19153	SS	N	N	N	N	N	L	Y
Ward Seed	19154	SS	N	N	N	N	N	L	Y

Hybrid information was provided by seed companies.

Abbreviations: Forage sorghum (FS), sorghum sudan (SS), sorghum (S), brown mid-rib (BMR), photoperiod sensitive (PS), not applicable (NA).

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

Table 3. 2019 Silage entries

Company	Variety	Type	BMR	Dwarf	Male sterile	Dry stalk	Photo-period sensitive	Maturity	Greenbug resistance	1000 seed weight, grams
Agrilead	Brutis	FS	Y	Y	N	N	N	N	ML	28.68
Agrilead	AL-Brutis	FS	Y	Y	N	N	N	N	ML	28.02
Alta Seeds	AF7201	FS	Y	N	N	Y	N	N	ME	34.64
Alta Seeds	ADV F7232	FS	Y	Y	N	N	N	NA	M	25.65
Alta Seeds	AF7401	FS	Y	Y	N	N	N	NA	ML	21.48
Alta Seeds	ADV XF025	FS	Y	N	N	Y	N	N	M	26.34
Alta Seeds	ADV XF033	FS	N	N	N	N	N	M	NA	36.38
Alta Seeds	AF7102	FS	Y	Y	N	N	N	E	NA	24.13
Dyna-Gro Seed	Super Sile 30	FS	N	N	N	N	N	N	EM	23.57
Dyna-Gro Seed	FX19125 BMR	FS	Y	N	N	N	N	N	E	25.87
Dyna-Gro Seed	F72FS05	FS	N	N	N	N	N	C	EM	37.11
Dyna-Gro Seed	FX19178 BMR	FS	Y	Y	N	N	N	N	EM	32.78
Dyna-Gro Seed	Super Sile 20	FS	N	N	N	N	N	N	ML	23.25
Dyna-Gro Seed	F74FS72 BMR	FS	Y	Y	N	N	N	N	M	25.88
Dyna-Gro Seed	TopTon	FS	N	N	N	N	N	N	L	34.29
Dyna-Gro Seed	GX13692	DF	N	N	N	N	N	N	ML	34.6
Dyna-Gro Seed	Dual Forage SCA II	DF	N	N	N	N	N	N	ML	33.93
Dyna-Gro Seed	FX19526 BMR	FS	Y	N	N	N	N	N	E	31.19

continued

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Table 3. 2019 Silage entries

Company	Variety	Type	BMR	Dwarf	Male sterile	Dry stalk	Photo-period sensitive	Maturity	Greenbug resistance	1000 seed weight, grams
Fontanelle	Nutri-Chomp	FS	Y	N	N	N	N	NA	ML	28.18
KSU (check)	KS Orange	FS	N	N	N	N	N	N	M	19.28
MOJO	Opal	FS	N	Y	N	N	N	N	M	35.84
Star Seed	Packer	FS	N	N	N	N	N	NA	ML	27.86
Star Seed	Extreme BMR	FS	Y	N	N	N	N	NA	E	31.54
Wards	18096	FS	N	Y	N	N	N	Y	M	28.46
Wards	18116	FS	Y	N	N	Y	N	Y	M	22.19
Wards	18118	FS	Y	N	Y	N	N	Y	M	28
Wards	19038	FS	N	Y	N	N	N	Y	M	38.63
Wards	19040	FS	N	Y	N	N	N	Y	M	33.41
Wards	19042	FS	N	Y	N	N	N	Y	L	32.64
Wards	19155	FS	Y	Y	Y	N	N	Y	M	24.51
Wards	19156	FS	N	N	N	Y	N	Y	M	28.25
Wards	19174	FS	Y	Y	N	Y	N	Y	E	26.99
Wards	19175	FS	Y	N	N	Y	N	Y	E	28.48
Wards	19176	FS	Y	N	N	Y	N	Y	E	31.53
Wards	19177	FS	Y	N	N	Y	N	Y	E	27.08
Wards	19178	FS	Y	Y	N	Y	N	Y	E	34.87
Wards	19179	FS	N	Y	N	N	N	Y	L	35.52
Wards	19181	FS	Y	Y	N	N	N	Y	L	32.63

Hybrid information was provided by seed companies.

Abbreviations: Forage sorghum (FS), sorghum sudan (SS), sorghum (S), brown mid-rib (BMR), photoperiod sensitive (PS), not applicable (NA).

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

Table 4. 2019 Corn silage entries

Company	Variety/entry	Herbicide resistance	Insecticide resistance	Maturity	BMR	Grams /1000 seeds
Dyna-Gro Seed	D54DC94	RR	VT2P	114	N	216.23
Dyna-Gro Seed	D55QC73	RR	3110	115	N	241.85
Dyna-Gro Seed	D57VC75	RR	VT2P	117	N	224.08
Dyna-Gro Seed	D58VC65	RR	VT2P	118	N	220.22
Dyna-Gro Seed	D58QC72	RR	3110	118	N	238.39
Dyna-Gro Seed	D58RR70	RR	N	118	N	279.93

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Table 5. Irrigation, plant, harvest, and fertilizer details for hay and silage variety tests near Garden City, Hays, and Scandia, KS, in 2019

Location	Irrigation	Planting date	1st harvest date	2nd harvest date	Seeding rate	Harvest area, ft ²	Fertilizer	
							lb N/a	lb P ₂ O ₅ /a
Hay test								
Garden City	11.81	4-Jun	16-Aug 23-Aug 9-Oct	17-Oct	20 (lb/a)	360	92	0
Hays	---	5-Jun	5-Sep 19-Sep 26-Sep	---	15 (lb/a)	90	50	0
Scandia	---	17-Jun	28-Aug 9-Sep	---	20 (lb/a)	60	50	0
Silage test								
Garden City	11.81	17-May	14-Sep 27-sep	---	80000 (seeds/a)	225	92	0
Hays	---	6-Jun	20-Sep 26-Sep 16-Oct	---	50000 (seeds/a)	25	50	0
Scandia	---	14-Jun	11-Sep 26-Sep 8-Oct	---	80000 (seeds/a)	67.5	50	0
Corn silage test								
Garden City	11.81	17-May	14-Sep 27-sep	---	32000 (seeds/a)	225	92	0
Hays	---	6-Jun	18-Sep	---	32000 (seeds/a)	25	50	0

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**Table 6. Hay performance test near Garden City
2019 Garden City, Kansas Hay Performance Test, Finney County**

Brand	Name	Performance					
		1st cutting	2nd cutting	Total yield	1st cutting	2nd cutting	1st height
		----- lb DM/a -----			----- % moisture -----		in.
Forage sorghum							
Dyna-Gro Seed	F75FS13	10781	3720	14501	0.80	0.40	108
KSU (check)	Early Sumac	9670	3434	13104	0.80	0.37	84
KSU (check)	Rox Orange	9971	2587	12558	0.81	0.26	84
Millet							
Coffey	Epic	11223	820	12043	0.74	0.29	45
Coffey	Leafy TR 7	11010	2796	13806	0.72	0.34	55
Coffey	Leafy TR 9	11136	1852	12988	0.71	0.27	58
Coffey	Tifleaf	10071	2146	12217	0.73	0.33	50
Dyna-Gro Seed	PearlMil	10752	2113	12865	0.69	0.21	60
Sorghum sudan							
Alta Seeds	ADV XS007	11877	2685	14562	0.79	0.19	105
Alta Seeds	ADV XS008	10326	2298	12624	0.79	0.33	84
Alta Seeds	ADV XS8007	10463	4328	14791	0.79	0.30	95
Alta Seeds	AS6401	10782	3326	14108	0.83	0.55	100
Alta Seeds	AS6402	11006	2201	13207	0.80	0.39	82
Browning Seed	Cadan PPS	8533	3993	12526	0.83	0.26	74
Browning Seed	Sweet Sioux BMR	10117	2730	12847	0.78	0.34	109
Browning Seed	Wondergreen	9962	5579	15541	0.74	0.34	128
Channel Seed	Qualimax	13630	2060	15690	0.76	0.26	105
Coffey	5618	8428	1313	9741	0.78	0.44	69
Coffey	5619	8497	2721	11218	0.74	0.28	89
Coffey	Surpass	8943	3718	12661	0.76	0.38	74
Coffey	Xtragraze	10265	2671	12936	0.75	0.29	94
Dyna-Gro Seed	Danny Boy II BMR	11150	2801	13951	0.83	0.37	84
Dyna-Gro Seed	Fullgraze II	15913	1595	17508	0.73	0.21	112
Dyna-Gro Seed	Fullgraze II BMR	13215	2311	15526	0.79	0.31	96
Dyna-Gro Seed	Super Sweet 10	10320	3400	13720	0.79	0.44	105
Sorghum Partners	Sordan 79	10512	2311	12823	0.80	0.30	90
Sorghum Partners	Sordan Headless	13508	1570	15078	0.80	0.20	84
Sorghum Partners	SP4105 BMR	9997	2403	12400	0.82	0.35	76
Sorghum Partners	SP4555 BMR	9555	3496	13051	0.80	0.26	96
Star Seed	Bruiser BMR	10914	1807	12721	0.80	0.26	85
Star Seed	Excel	14248	3097	17345	0.78	0.22	108
Star Seed	Nutrimaxx II BMR	13781	2446	16227	0.80	0.23	95

continued

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**Table 6. Hay performance test near Garden City
2019 Garden City, Kansas Hay Performance Test, Finney County**

Brand	Name	Performance					
		1st cutting	2nd cutting	Total yield	1st cutting	2nd cutting	1st height
		----- lb DM/a -----			----- % moisture -----		in.
Ward Seed	18178	9008	3841	12849	0.80	0.39	109
Ward Seed	18180	13252	2269	15521	0.77	0.24	114
Ward Seed	18181	12845	1466	14311	0.81	0.22	99
Ward Seed	18182	10588	3023	13611	0.77	0.37	92
Ward Seed	18552	11167	4047	15214	0.76	0.33	119
Ward Seed	19102	13253	2371	15624	0.82	0.30	109
Ward Seed	19153	13972	2042	16014	0.78	0.24	124
Ward Seed	19154	13700	3447	17147	0.77	0.25	128
	Average	11209	2721	13929	1	0	92
	LSD (0.05)	2486	1914	2566			

Plant date: 6/4/2019

Days to harvest: 73,80,127 135

Values in bold are in the top least significant difference (LSD) group.

Table 6b. 2019 Garden City, Kansas Hay Performance Test, Finney County

Brand	Name	Ash	Ca	P	Mg	K	S	NFC	TDN	NEL	NEG	NEM	RFV
----- % -----													
Forage sorghum													
Dyna-Gro Seed	F75FS13	12.02	0.26	0.22	0.19	2.63	0.16	23.76	55.23	56.05	26.35	51.74	96.30
KSU (check)	Early Sumac	11.23	0.29	0.21	0.21	2.41	0.16	27.00	58.16	59.31	30.43	56.16	103.57
KSU (check)	Rox Orange	10.85	0.27	0.22	0.19	2.38	0.15	26.30	57.73	58.83	29.85	55.53	101.54
Millet													
Coffey	Epic	13.19	0.30	0.26	0.25	3.26	0.20	18.41	54.08	54.77	25.55	50.87	91.50
Coffey	Leafy TR 7	12.22	0.25	0.26	0.22	3.13	0.19	17.24	52.74	53.28	23.46	48.60	83.70
Coffey	Leafy TR 9	13.03	0.26	0.26	0.23	3.31	0.19	16.44	51.81	52.24	22.18	47.23	83.70
Coffey	Tifleaf	11.97	0.26	0.25	0.25	3.13	0.19	16.38	52.57	53.09	23.39	48.53	82.73
Dyna-Gro Seed	PearlMil	12.26	0.27	0.26	0.25	3.15	0.20	16.97	52.92	53.48	23.91	49.09	85.88
Sorghum sudan													
Alta Seeds	ADV XS007	13.72	0.26	0.25	0.16	3.13	0.16	20.36	53.95	54.63	24.77	50.02	90.17
Alta Seeds	ADV XS008	14.11	0.29	0.26	0.19	3.08	0.20	18.32	53.84	54.50	25.26	50.55	90.90
Alta Seeds	ADV XS8007	13.15	0.29	0.25	0.19	2.96	0.18	21.85	54.54	55.29	25.77	51.11	95.77
Alta Seeds	AS6401	14.59	0.31	0.26	0.20	3.26	0.19	19.86	53.21	53.80	24.04	49.23	92.74
Alta Seeds	AS6402	13.93	0.29	0.25	0.19	3.12	0.21	18.64	54.37	55.10	26.10	51.46	92.69
Browning Seed	Cadan PPS	15.54	0.29	0.29	0.20	3.64	0.20	16.76	51.50	51.90	22.06	47.09	87.95
Browning Seed	Sweet Sioux BMR	13.59	0.28	0.24	0.18	2.85	0.17	21.67	52.94	53.50	23.35	48.49	93.65
Browning Seed	Wondergreen	11.53	0.24	0.21	0.17	2.41	0.15	18.96	51.90	52.34	21.64	46.64	81.84
Channel Seed	Qualimax	12.43	0.24	0.22	0.16	2.89	0.14	20.06	52.71	53.25	22.52	47.59	85.37
Coffey	5618	12.85	0.27	0.25	0.18	2.83	0.19	19.97	55.81	56.70	27.90	53.41	94.23
Coffey	5619	12.66	0.29	0.23	0.20	2.46	0.18	24.32	57.81	58.93	30.50	56.24	104.11
Coffey	Surpass	12.85	0.24	0.25	0.18	2.73	0.19	19.63	55.97	56.88	28.17	53.70	94.71
Coffey	Xtragraze	12.89	0.27	0.24	0.18	2.70	0.18	21.02	55.60	56.46	27.30	52.75	93.80

continued

Table 6b. 2019 Garden City, Kansas Hay Performance Test, Finney County

Brand	Name	Ash	Ca	P	Mg	K	S	NFC	TDN	NEL	NEG	NEM	RFV
----- % -----													
Dyna-Gro Seed	Danny Boy II BMR	16.55	0.29	0.30	0.17	3.66	0.21	17.05	51.04	51.39	21.29	46.26	88.50
Dyna-Gro Seed	Fullgraze II	10.63	0.24	0.18	0.14	2.64	0.14	16.04	51.48	51.88	20.62	45.55	73.04
Dyna-Gro Seed	Fullgraze II BMR	13.55	0.24	0.25	0.14	3.18	0.17	15.87	50.95	51.28	20.39	45.31	78.33
Dyna-Gro Seed	Super Sweet 10	12.77	0.27	0.24	0.20	2.71	0.17	21.45	52.86	53.41	23.43	48.58	91.43
Sorghum Partners	Sordan 79	13.09	0.24	0.23	0.18	3.12	0.15	17.92	50.48	50.77	19.50	44.35	80.26
Sorghum Partners	Sordan Headless	13.72	0.24	0.25	0.18	3.45	0.17	15.33	49.60	49.78	18.46	43.24	76.95
Sorghum Partners	SP4105 BMR	16.00	0.32	0.29	0.21	3.62	0.21	16.72	51.43	51.81	21.84	46.86	89.85
Sorghum Partners	SP4555 BMR	13.46	0.26	0.25	0.17	2.70	0.17	22.50	53.83	54.49	24.60	49.83	95.51
Star Seed	Bruiser BMR	11.86	0.25	0.23	0.18	2.83	0.16	21.89	55.13	55.94	26.16	51.53	90.74
Star Seed	Excel	12.52	0.24	0.22	0.16	2.85	0.15	21.63	53.66	54.30	24.08	49.27	89.49
Star Seed	Nutrimaxx II BMR	13.06	0.24	0.22	0.19	3.22	0.15	17.44	51.96	52.41	21.78	46.80	83.47
Ward Seed	18178	13.86	0.27	0.27	0.17	2.91	0.18	21.95	54.35	55.08	25.64	50.96	97.87
Ward Seed	18180	12.57	0.24	0.23	0.16	2.93	0.14	18.56	51.42	51.81	20.83	45.77	81.53
Ward Seed	18181	12.62	0.24	0.22	0.18	3.22	0.15	16.26	51.79	52.22	21.28	46.25	79.68
Ward Seed	18182	13.05	0.24	0.25	0.16	2.75	0.18	19.60	53.92	54.59	24.82	50.07	90.21
Ward Seed	18552	12.06	0.24	0.22	0.17	2.54	0.15	21.36	53.21	53.81	23.38	48.52	87.80
Ward Seed	19102	13.21	0.24	0.25	0.16	3.26	0.17	15.60	50.26	50.51	19.30	44.14	76.11
Ward Seed	19153	12.15	0.24	0.24	0.14	2.81	0.15	19.37	52.75	53.29	22.98	48.09	84.39
Ward Seed	19154	12.16	0.24	0.22	0.15	2.76	0.14	19.84	52.71	53.25	22.59	47.67	83.88
	Average	12.99	0.26	0.24	0.18	2.97	0.17	19.51	53.31	53.91	23.94	49.13	88.65

Values in bold are in the top least significant difference (LSD) group.

Abbreviations for this table and following tables: Crude protein (CP), adjusted crude protein (Adj_CP), nitrogen free neutral detergent fiber (NDFn), acid detergent fiber (ADF), neutral detergent fiber organic matter basis (aNDFom), lignin, undigested aNDFom remaining after in vitro digestion at 240 hr (uNDFom240), neutral detergent fiber-digestible at 240 hr (NDFD240), water soluble carbohydrates (WSC), starch, total fatty acids (TFA), ash, calcium (Ca), phosphorus (P), magnesium (Mg), potassium (K), sulfur (S), non-fiber carbohydrates (NFC), total digestible nutrients (TDN), net energy for lactation (NEL), net energy for gain (NEG), net energy for maintenance (NEM), and relative feed value (RFV).

Table 6b, continued. 2019 Garden City, Kansas Hay Performance Test, Finney County

Brand	Name	CP	Adj_CP	NDFn	ADF	aNDFom	Lignin	uNDFom240	NDFD240	WSC (Sugar)	Starch	TFA (Fat)
----- % -----												
Forage sorghum												
Dyna-Gro Seed	F75FS13	9.26	8.68	2.49	38.77	55.68	4.54	16.96	69.47	7.95	6.48	0.77
KSU (check)	Early Sumac	9.46	8.98	2.46	36.06	52.98	3.76	16.48	68.88	10.20	6.25	0.80
KSU (check)	Rox Orange	9.39	8.99	2.46	36.53	54.17	4.02	16.64	69.26	10.33	6.27	0.74
Millet												
Coffey	Epic	10.74	10.70	2.59	37.98	58.52	4.18	14.49	75.24	7.59	2.98	0.74
Coffey	Leafy TR 7	10.15	9.99	2.42	41.04	61.06	5.10	17.06	72.03	6.04	2.25	0.76
Coffey	Leafy TR 9	10.28	10.10	2.58	41.44	61.11	5.15	16.64	72.75	5.77	2.45	0.72
Coffey	Tifleaf	10.61	10.46	2.60	41.25	61.95	5.14	16.52	73.30	5.65	2.79	0.68
Dyna-Gro Seed	PearlMil	10.70	10.54	2.58	40.34	60.89	4.99	17.10	71.90	5.04	3.44	0.77
Sorghum sudan												
Alta Seeds	ADV XS007	9.48	9.14	2.59	40.37	57.30	4.10	17.08	70.22	9.45	2.33	0.74
Alta Seeds	ADV XS008	11.01	10.70	2.77	40.22	57.55	3.89	15.45	73.15	5.81	1.39	0.77
Alta Seeds	ADV XS8007	9.96	9.57	2.54	38.93	55.76	4.34	16.70	69.98	8.06	4.84	0.82
Alta Seeds	AS6401	10.40	9.79	2.87	40.20	56.28	4.11	16.27	71.10	6.71	3.05	0.74
Alta Seeds	AS6402	11.23	11.00	2.81	39.45	57.20	3.79	15.84	72.26	5.27	1.83	0.81
Browning Seed	Cadan PPS	11.18	10.76	2.92	41.92	57.72	4.34	16.63	71.18	4.89	1.41	0.71
Browning Seed	Sweet Sioux BMR	9.58	8.97	2.55	39.85	55.88	5.00	17.00	69.46	6.10	6.45	0.83
Browning Seed	Wondergreen	8.84	8.39	2.33	43.18	61.34	5.86	20.32	66.81	5.77	4.80	0.66
Channel Seed	Qualimax	8.28	7.77	2.36	41.68	59.92	5.07	19.02	68.22	9.39	3.57	0.67
Coffey	5618	10.67	10.60	2.52	38.02	57.17	3.66	15.38	73.09	6.74	2.50	0.85
Coffey	5619	10.38	10.31	2.29	35.54	53.08	3.30	14.61	72.44	10.15	4.46	0.84
Coffey	Surpass	10.80	10.70	2.49	37.61	57.33	3.55	15.80	72.43	7.42	1.88	0.87
Coffey	Xtragraze	10.08	9.85	2.51	38.62	56.75	3.74	16.76	70.38	7.28	2.87	0.78

continued

Table 6b, continued. 2019 Garden City, Kansas Hay Performance Test, Finney County

Brand	Name	CP	Adj_CP	NDFn	ADF	aNDFom	Lignin	uNDFom240	NDFD240	WSC (Sugar)	Starch	TFA (Fat)
----- % -----												
Dyna-Gro Seed	Danny Boy II BMR	11.04	10.40	2.98	42.28	56.76	4.02	16.97	70.11	4.47	2.00	0.58
Dyna-Gro Seed	Fullgraze II	7.91	7.35	2.45	44.87	66.37	5.66	21.66	67.35	6.32	1.67	0.50
Dyna-Gro Seed	Fullgraze II BMR	9.24	8.59	2.70	44.14	62.48	4.91	19.53	68.75	5.32	1.78	0.57
Dyna-Gro Seed	Super Sweet 10	10.10	9.44	2.74	40.98	56.68	5.32	18.28	67.72	4.98	6.48	0.75
Sorghum Partners	Sordan 79	8.72	7.98	2.59	44.04	61.28	5.68	19.65	67.89	5.60	4.16	0.59
Sorghum Partners	Sordan Headless	9.17	8.55	2.71	44.88	62.97	5.53	19.50	69.04	5.15	1.61	0.52
Sorghum Partners	SP4105 BMR	10.95	10.46	2.88	41.09	57.50	4.13	16.19	71.88	5.05	1.72	0.71
Sorghum Partners	SP4555 BMR	9.56	9.01	2.43	39.28	55.06	4.67	16.95	69.19	6.20	5.73	0.84
Star Seed	Bruiser BMR	9.01	8.50	2.42	39.50	57.89	4.34	15.55	73.08	5.51	5.81	0.77
Star Seed	Excel	8.84	8.41	2.44	40.65	57.75	4.86	18.79	67.46	9.77	3.60	0.70
Star Seed	Nutrimaxx II BMR	8.92	8.61	2.54	41.43	61.40	5.00	16.83	72.59	8.14	2.52	0.71
Ward Seed	18178	10.27	9.83	2.55	38.40	54.60	4.24	15.73	71.17	6.02	5.93	0.87
Ward Seed	18180	8.46	8.07	2.37	43.21	61.13	5.58	19.93	67.38	8.65	3.86	0.64
Ward Seed	18181	8.51	7.85	2.54	43.06	63.56	4.80	17.20	72.94	6.05	2.09	0.60
Ward Seed	18182	9.72	9.31	2.43	40.31	58.26	4.33	17.44	70.08	5.90	3.74	0.81
Ward Seed	18552	8.76	8.12	2.40	41.69	58.49	5.21	19.44	66.70	6.24	5.50	0.73
Ward Seed	19102	8.97	8.34	2.47	45.40	63.14	5.38	19.96	68.41	4.38	1.02	0.54
Ward Seed	19153	9.17	8.80	2.53	42.11	60.10	5.27	19.18	68.08	8.35	3.04	0.74
Ward Seed	19154	8.36	7.94	2.28	42.28	60.20	5.22	19.61	67.42	8.99	2.95	0.71
	Average	9.70	9.29	2.55	40.72	58.63	4.64	17.43	70.27	6.82	3.49	0.72

Values in bold are in the top least significant difference (LSD) group.

Abbreviations for this table and following tables: Crude protein (CP), adjusted crude protein (Adj_CP), nitrogen free neutral detergent fiber (NDFn), acid detergent fiber (ADF), neutral detergent fiber organic matter basis (aNDFom), lignin, undigested aNDFom remaining after in vitro digestion at 240 hr (uNDFom240), neutral detergent fiber-digestible at 240 hr (NDFD240), water soluble carbohydrates (WSC), starch, total fatty acids (TFA), ash, calcium (Ca), phosphorus (P), magnesium (Mg), potassium (K), sulfur (S), non-fiber carbohydrates (NFC), total digestible nutrients (TDN), net energy for lactation (NEL), net energy for gain (NEG), net energy for maintenance (NEM), and relative feed value (RFV).

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**Table 7. Hay performance test near Hays
2019 Hays, Kansas Forage Hay Performance Test, Ellis County**

Brand	Name	Performance		
		1st cutting lb DM/a	1st cutting % moisture	1st height in.
Forage sorghum				
Dyna-Gro Seed	F75FS13	10680	0.64	86
KSU (check)	Early Sumac	9615	0.65	69
KSU (check)	Rox Orange	9801	0.70	72
Sorghum sudan				
Agrilead	AL-Nutrimaxx BMR	11126	0.65	72
Agrilead	Nutrimaxx BMR	12939	0.67	108
Alta Seeds	ADV XS007	12203	0.69	95
Alta Seeds	ADV XS008	12455	0.66	87
Alta Seeds	ADV XS8007	12166	0.65	87
Alta Seeds	AS6401	11092	0.67	102
Alta Seeds	AS6402	10850	0.65	91
Browning Seed	Cadan PPS	13746	0.69	84
Browning Seed	Sweet Sioux BMR	12167	0.61	100
Browning Seed	Wondergreen	9449	0.59	88
Channel Seed	Qualimax	12078	0.63	103
Dyna-Gro Seed	Danny Boy II BMR	15623	0.64	88
Dyna-Gro Seed	Fullgraze II	11117	0.62	120
Dyna-Gro Seed	Fullgraze II BMR	13817	0.66	118
Dyna-Gro Seed	Super Sweet 10	10833	0.64	83
Star Seed	Bruiser BMR	11856	0.67	98
Star Seed	Excel	12778	0.66	112
Star Seed	Nutrimaxx II BMR	10186	0.58	106
Ward Seed	18178	12243	0.66	90
Ward Seed	18180	10717	0.64	108
Ward Seed	18181	14085	0.69	96
Ward Seed	18182	11596	0.61	94
Ward Seed	19153	11593	0.64	120
Ward Seed	19154	9737	0.65	104
	Average	11724	0.65	96
	LSD (0.05)	2712		

Plant date: 6/5/2019

Days to harvest: 92,106,113

Values in bold are in the top least significant difference (LSD) group.

Table 7b. 2019 Hays, Kansas Forage Hay Performance Test, Ellis County

Brand	Name	Forage quality										
		CP	Adj_ CP	NDFn	ADF	aNDFom	Lignin	uNDFom240	NDFD240	WSC (Sugar)	Starch	TFA (Fat)
----- % -----												
Forage sorghum												
Dyna-Gro Seed	F75FS13	7.22	7.17	1.78	37.51	57.42	3.94	15.21	73.50	11.77	3.98	0.76
KSU (check)	Early Sumac	6.58	6.35	1.73	36.83	57.79	3.94	14.31	75.21	12.04	4.90	0.75
KSU (check)	Rox Orange	8.18	8.15	1.98	38.14	59.53	3.92	15.21	74.44	10.51	2.11	0.67
Millet												
Dyna-Gro Seed	PearlMil	9.35	9.32	1.94	37.29	57.11	4.21	13.45	76.46	8.90	2.58	0.93
Sorghum sudan												
Agrilead	AL-Nutri Maxx BMR	8.49	8.36	1.95	38.32	59.69	4.07	15.39	74.24	8.49	3.17	0.82
Agrilead	Nutri Maxx BMR	8.56	8.56	1.95	37.94	59.58	3.78	14.25	76.07	9.88	1.91	0.79
Alta Seeds	ADV XS007	8.10	7.95	1.89	39.48	60.37	3.73	15.15	75.01	9.07	1.25	0.66
Alta Seeds	ADV XS008	8.61	8.55	2.04	37.80	60.10	3.72	13.94	76.80	9.77	0.96	0.80
Alta Seeds	ADV XS8007	9.58	9.52	2.15	37.19	58.38	3.66	12.77	78.15	8.79	0.86	0.88
Alta Seeds	AS6401	9.10	8.97	2.22	37.09	58.05	3.69	13.72	76.41	9.31	1.65	0.82
Alta Seeds	AS6402	8.77	8.68	2.12	38.06	59.89	3.74	14.23	76.23	8.11	1.43	0.82
Browning Seed	Cadan PPS	8.36	8.19	2.03	38.22	58.39	3.89	14.50	75.18	9.22	1.58	0.77
Browning Seed	Sweet Sioux BMR	7.76	7.72	1.82	37.20	58.12	3.87	13.91	76.03	10.99	3.37	0.78
Browning Seed	Wondergreen	7.27	7.08	1.80	37.62	57.29	4.20	15.46	73.06	9.62	6.42	0.74
Channel Seed	Qualimax	6.47	6.30	1.49	40.15	59.16	4.01	16.13	72.75	11.95	2.63	0.54

continued

Table 7b. 2019 Hays, Kansas Forage Hay Performance Test, Ellis County

Brand	Name	Forage quality										
		CP	Adj_ CP	NDFn	ADF	aNDFom	Lignin	uNDFom240	NDFD240	WSC (Sugar)	Starch	TFA (Fat)
		----- % -----										
Dyna-Gro Seed	Danny Boy II BMR	9.80	9.70	2.34	35.76	57.42	3.61	13.31	76.84	9.19	1.34	0.88
Dyna-Gro Seed	Fullgraze II	7.55	7.50	1.93	39.01	62.53	4.18	15.87	74.65	9.64	1.56	0.67
Dyna-Gro Seed	Fullgraze II BMR	9.62	9.52	2.25	37.11	59.97	3.77	12.48	79.20	7.98	0.39	0.84
Dyna-Gro Seed	Super Sweet 10	7.68	7.47	1.85	37.72	57.46	4.33	15.60	72.81	9.73	4.88	0.80
Star Seed	Bruiser BMR	7.28	7.00	1.98	38.70	61.86	4.00	13.52	78.12	9.66	0.96	0.64
Star Seed	Excel	7.95	7.73	1.93	37.87	58.79	4.01	14.12	76.14	10.82	1.66	0.77
Star Seed	Nutrimaxx II BMR	9.66	9.55	2.00	38.60	59.95	4.22	14.36	76.07	7.87	2.28	0.84
Ward Seed	18178	8.25	8.22	1.93	37.20	57.25	3.65	14.01	75.48	11.31	2.12	0.80
Ward Seed	18180	7.20	7.11	1.65	39.95	61.61	4.48	15.96	74.08	10.37	2.71	0.63
Ward Seed	18181	7.61	7.41	1.99	38.36	61.06	4.17	14.52	76.19	10.70	1.40	0.67
Ward Seed	18182	8.80	8.77	1.97	36.51	58.08	4.01	13.84	75.98	8.32	4.64	0.89
Ward Seed	19153	6.89	6.61	1.76	40.49	61.64	4.33	16.54	73.16	9.69	1.88	0.61
Ward Seed	19154	6.13	5.89	1.55	40.20	59.97	4.32	15.94	73.43	11.24	2.58	0.57
	Average	8.10	7.98	1.93	38.08	59.23	3.98	14.56	75.42	9.82	2.40	0.75

Values in bold are in the top least significant difference (LSD) group.

Table 7b, continued. 2019 Hays, Kansas Forage Hay Performance Test, Ellis County

Brand	Name	Forage quality											
		Ash	Ca	P	Mg	K	S	NFC	TDN	NEL	NEG	NEM	RFV
----- % -----													
Forage sorghum													
Dyna-Gro Seed	F75FS13	10.33	0.24	0.19	0.13	1.81	0.12	25.05	57.73	58.84	29.11	54.72	93.34
KSU (check)	Early Sumac	9.82	0.24	0.16	0.14	1.87	0.11	25.80	58.03	59.17	29.19	54.81	94.05
KSU (check)	Rox Orange	10.21	0.24	0.22	0.12	2.00	0.13	22.39	57.22	58.26	28.80	54.39	90.27
Millet													
Dyna-Gro Seed	PearlMil	12.27	0.30	0.26	0.17	2.54	0.17	21.27	55.69	56.57	27.31	52.76	95.11
Sorghum sudan													
Agrilead	AL-Nutri Maxx BMR	11.30	0.24	0.21	0.14	2.10	0.15	20.65	55.99	56.90	27.27	52.73	89.73
Agrilead	Nutri Maxx BMR	10.70	0.24	0.22	0.13	2.23	0.15	21.31	57.14	58.18	28.92	54.51	89.86
Alta Seeds	ADV XS007	11.48	0.24	0.23	0.14	2.24	0.14	20.28	56.00	56.91	27.12	52.56	87.25
Alta Seeds	ADV XS008	11.75	0.24	0.23	0.15	2.52	0.15	19.78	56.04	56.95	27.40	52.86	89.43
Alta Seeds	ADV XS8007	11.57	0.24	0.25	0.15	2.50	0.17	20.74	56.92	57.93	29.02	54.63	92.63
Alta Seeds	AS6401	12.11	0.24	0.24	0.15	2.53	0.16	21.13	56.28	57.22	27.90	53.41	93.88
Alta Seeds	AS6402	12.18	0.24	0.23	0.13	2.50	0.16	19.46	55.59	56.46	26.84	52.26	89.87
Browning Seed	Cadan PPS	12.45	0.24	0.23	0.15	2.55	0.16	21.06	55.42	56.27	26.42	51.80	90.92
Browning Seed	Sweet Sioux BMR	10.55	0.24	0.20	0.13	2.05	0.14	23.61	57.50	58.57	29.05	54.66	92.90
Browning Seed	Wondergreen	10.29	0.24	0.18	0.14	1.72	0.12	25.21	57.24	58.29	28.38	53.94	94.33
Channel Seed	Qualimax	11.01	0.24	0.19	0.12	1.87	0.11	23.31	56.10	57.02	26.56	51.96	88.04

continued

Table 7b, continued. 2019 Hays, Kansas Forage Hay Performance Test, Ellis County

Brand	Name	Forage quality											
		Ash	Ca	P	Mg	K	S	NFC	TDN	NEL	NEG	NEM	RFV
		----- % -----											
Dyna-Gro Seed	Danny Boy II BMR	12.19	0.24	0.26	0.16	2.73	0.17	21.05	56.58	57.56	28.59	54.17	95.62
Dyna-Gro Seed	Fullgraze II	9.80	0.24	0.19	0.13	2.07	0.13	20.38	56.31	57.26	27.30	52.76	84.70
Dyna-Gro Seed	Fullgraze II BMR	12.05	0.24	0.24	0.17	2.62	0.17	18.78	55.71	56.58	27.36	52.82	91.09
Dyna-Gro Seed	Super Sweet 10	10.75	0.24	0.20	0.14	2.01	0.13	24.16	56.55	57.52	27.66	53.14	93.97
Star Seed	Bruiser BMR	10.92	0.24	0.19	0.15	2.34	0.12	20.28	55.55	56.40	26.09	51.45	85.30
Star Seed	Excel	11.05	0.24	0.21	0.15	2.27	0.14	22.37	56.50	57.46	27.71	53.21	92.05
Star Seed	Nutrimaxx II BMR	10.90	0.26	0.25	0.17	2.46	0.16	19.65	56.07	56.99	27.92	53.43	88.27
Ward Seed	18178	11.11	0.24	0.22	0.12	2.08	0.14	23.53	57.64	58.74	29.43	55.08	94.19
Ward Seed	18180	9.79	0.24	0.19	0.13	1.85	0.12	21.41	55.93	56.83	26.65	52.05	85.25
Ward Seed	18181	10.53	0.24	0.19	0.15	2.28	0.13	21.13	55.94	56.85	26.80	52.21	86.60
Ward Seed	18182	10.67	0.24	0.22	0.15	2.16	0.15	22.53	57.20	58.24	29.02	54.63	94.63
Ward Seed	19153	10.93	0.24	0.20	0.13	2.04	0.13	20.69	54.98	55.77	25.15	50.43	83.89
Ward Seed	19154	11.14	0.24	0.20	0.13	2.02	0.11	22.74	55.23	56.05	25.20	50.48	86.89
	Average	11.07	0.24	0.21	0.14	2.21	0.14	21.78	56.40	57.35	27.65	53.14	90.50

Values in bold are in the top least significant difference (LSD) group.

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**Table 8. Hay performance test near Scandia
2019 Scandia, Kansas Forage Hay Performance Test, Republic County**

Brand	Name	Performance		
		1st cutting lb DM/a	1st cutting % moisture	1st height in.
Forage sorghum				
Dyna-Gro Seed	F75FS13	9258	0.82	108
KSU (check)	Early Sumac	8718	0.81	87
Sorghum sudan				
Agrilead	AL-Nutri Maxx BMR	7419	0.80	96
Agrilead	Nutri Maxx BMR	8080	0.82	96
Alta Seeds	ADV XS007	8312	0.85	87
Alta Seeds	ADV XS008	10827	0.73	87
Alta Seeds	ADV XS8007	10282	0.78	90
Alta Seeds	AS6401	8070	0.84	93
Alta Seeds	AS6402	7693	0.82	72
Browning Seed	Cadan PPS	10010	0.81	78
Browning Seed	Sweet Sioux BMR	9724	0.78	96
Browning Seed	Wondergreen	7599	0.77	120
Dyna-Gro Seed	Danny Boy II BMR	11172	0.78	81
Dyna-Gro Seed	Fullgraze II	11965	0.78	87
Dyna-Gro Seed	Fullgraze II BMR	14297	0.76	111
Dyna-Gro Seed	Super Sweet 10	10581	0.79	96
Star Seed	Bruiser BMR	10195	0.83	96
Star Seed	Excel	16196	0.75	111
Star Seed	Nutrimaxx II BMR	10281	0.82	75
Ward Seed	18178	10144	0.82	105
Ward Seed	18180	14212	0.77	114
Ward Seed	18181	10836	0.83	81
Ward Seed	18182	11555	0.77	102
Ward Seed	19153	10546	0.82	102
Ward Seed	19154	14100	0.75	108
	Average	10483	0.80	95
	LSD (0.05)	2365		

Plant date: 6/17/2019

Days to harvest: 72,84

Values in bold are in the top least significant difference (LSD) group.

Table 8b. 2019 Scandia, Kansas Forage Hay Performance Test, Republic County

Brand	Name	Forage quality									WSC (Sugar)	Starch	TFA (Fat)
		CP	Adj_CP	NDFn	ADF	aNDFom	Lignin	uNDFom240	NDFD240	%			
Forage sorghum													
Dyna-Gro Seed	F75FS13	10.84	10.83	2.61	38.84	58.94	4.42	15.10	74.39	7.92	0.10	0.90	
KSU (check)	Early Sumac	11.14	11.13	2.65	36.39	57.01	3.83	13.66	76.03	9.18	0.37	0.96	
Sorghum sudan													
Agrilead	AL-Nutri Maxx BMR	10.96	10.91	2.56	37.71	58.04	3.95	14.61	74.86	9.32	0.10	1.03	
Agrilead	Nutri Maxx BMR	10.07	9.86	2.44	39.32	58.10	3.91	14.79	74.56	8.45	0.10	0.92	
Alta Seeds	ADV XS007	9.96	9.71	2.44	41.43	58.02	3.64	13.74	76.35	7.03	0.10	0.81	
Alta Seeds	ADV XS008	8.83	8.79	2.05	37.15	55.32	3.32	13.71	75.21	11.33	1.81	0.87	
Alta Seeds	ADV XS8007	10.53	10.52	2.36	37.68	56.59	3.67	13.61	75.96	8.68	0.54	0.98	
Alta Seeds	AS6401	10.56	10.24	2.54	40.48	57.39	3.80	14.55	74.69	7.18	0.26	0.83	
Alta Seeds	AS6402	12.04	12.04	2.74	38.47	57.21	3.60	12.48	78.19	5.60	0.10	1.02	
Browning Seed	Cadan PPS	9.49	9.23	2.25	40.65	58.86	3.94	15.03	74.48	6.74	0.15	0.77	
Browning Seed	Sweet Sioux BMR	9.39	9.24	2.21	38.36	57.74	4.19	14.35	75.13	9.33	1.21	0.91	
Browning Seed	Wondergreen	9.73	9.59	2.40	42.47	63.47	5.44	18.69	70.54	6.93	0.14	0.79	
Dyna-Gro Seed	Danny Boy II BMR	8.89	8.63	2.09	38.80	56.68	3.69	14.07	75.18	9.80	1.13	0.81	
Dyna-Gro Seed	Fullgraze II	7.26	6.76	1.97	44.59	64.16	5.21	19.41	69.82	8.32	0.91	0.52	
Dyna-Gro Seed	Fullgraze II BMR	7.45	6.98	2.02	43.67	63.20	4.86	18.59	70.68	8.30	0.77	0.58	
Dyna-Gro Seed	Super Sweet 10	10.09	9.95	2.42	40.89	61.31	4.75	16.79	72.62	7.66	0.57	0.75	
Star Seed	Bruiser BMR	9.84	9.73	2.41	39.50	60.68	4.09	13.07	78.46	7.17	0.10	0.87	
Star Seed	Excel	6.65	6.43	1.56	40.19	58.71	4.67	17.82	69.58	14.37	3.16	0.65	
Star Seed	Nutrimaxx II BMR	10.40	10.28	2.55	38.92	60.39	4.39	13.23	78.12	7.90	0.10	0.88	
Ward Seed	18178	10.07	9.95	2.33	38.70	56.40	3.92	14.45	74.38	8.33	0.86	0.95	
Ward Seed	18180	8.38	8.07	2.07	41.32	59.98	4.94	18.31	69.49	9.85	1.49	0.67	
Ward Seed	18181	9.01	8.82	2.32	40.71	62.00	4.53	14.03	77.38	7.52	0.10	0.77	
Ward Seed	18182	8.87	8.76	2.18	40.24	59.55	4.16	16.75	71.87	8.88	0.53	0.87	
Ward Seed	19153	9.70	9.40	2.36	42.73	61.48	5.10	16.53	73.14	6.47	0.12	0.75	
Ward Seed	19154	7.32	7.11	1.83	39.84	58.94	4.76	17.19	70.84	13.02	2.53	0.71	
	Average	9.50	9.32	2.30	39.96	59.21	4.27	15.38	74.08	8.61	0.69	0.82	

Values in bold are in the top least significant difference (LSD) group.

Table 8b, continued. 2019 Scandia, Kansas Forage Hay Performance Test, Republic County

Brand	Name	Forage quality											
		Ash	Ca	P	Mg	K	S	NFC	TDN	NEL	NEG	NEM	RFV
----- % -----													
Forage sorghum													
Dyna-Gro Seed	F75FS13	10.02	0.24	0.26	0.17	2.69	0.19	20.91	56.90	57.92	29.46	55.11	90.17
KSU (check)	Early Sumac	9.91	0.24	0.26	0.17	2.55	0.18	22.62	58.62	59.83	31.87	57.74	96.74
Sorghum sudan													
Agrilead	AL-Nutri Maxx BMR	10.58	0.24	0.27	0.16	2.67	0.19	20.95	57.70	58.80	30.66	56.42	92.36
Agrilead	Nutri Maxx BMR	11.15	0.24	0.28	0.15	2.87	0.18	21.21	56.90	57.91	29.11	54.73	90.19
Alta Seeds	ADV XS007	12.05	0.24	0.33	0.14	3.41	0.20	20.60	56.25	57.19	28.14	53.67	87.72
Alta Seeds	ADV XS008	10.85	0.24	0.25	0.13	2.42	0.16	25.18	58.96	60.21	31.39	57.21	97.77
Alta Seeds	ADV XS8007	11.20	0.24	0.29	0.14	2.78	0.20	22.06	57.73	58.84	30.45	56.19	95.70
Alta Seeds	AS6401	12.01	0.24	0.32	0.15	3.31	0.20	20.76	56.20	57.13	28.31	53.86	90.52
Alta Seeds	AS6402	12.23	0.24	0.33	0.17	3.26	0.22	19.24	56.76	57.76	29.78	55.45	92.89
Browning Seed	Cadan PPS	12.09	0.24	0.31	0.15	3.07	0.18	20.04	55.39	56.24	26.79	52.20	87.85
Browning Seed	Sweet Sioux BMR	10.48	0.24	0.26	0.15	2.68	0.18	22.69	57.10	58.13	29.09	54.70	92.27
Browning Seed	Wondergreen	9.83	0.24	0.24	0.15	2.59	0.17	17.59	53.89	54.56	24.86	50.12	80.37
Dyna-Gro Seed	Danny Boy II BMR	12.05	0.24	0.29	0.15	3.06	0.17	22.66	56.54	57.51	28.11	53.63	93.42
Dyna-Gro Seed	Fullgraze II	8.55	0.24	0.21	0.13	2.21	0.12	20.48	54.88	55.66	25.10	50.37	75.91
Dyna-Gro Seed	Fullgraze II BMR	9.80	0.24	0.23	0.12	2.51	0.14	19.99	54.62	55.38	24.83	50.08	78.11
Dyna-Gro Seed	Super Sweet 10	9.57	0.24	0.25	0.15	2.28	0.16	19.69	55.84	56.73	27.67	53.16	84.92
Star Seed	Bruiser BMR	10.27	0.24	0.27	0.18	3.00	0.18	19.75	56.66	57.65	28.71	54.28	85.93
Star Seed	Excel	8.72	0.24	0.18	0.13	2.06	0.11	25.84	57.44	58.52	28.40	53.96	89.14
Star Seed	Nutrimaxx II BMR	10.57	0.24	0.27	0.21	3.17	0.18	19.30	55.90	56.80	27.89	53.40	87.56
Ward Seed	18178	11.78	0.24	0.29	0.14	2.95	0.19	22.12	56.74	57.73	28.91	54.51	93.36
Ward Seed	18180	9.66	0.24	0.23	0.16	2.30	0.14	22.38	55.65	56.51	26.66	52.06	85.45
Ward Seed	18181	9.91	0.24	0.26	0.18	3.08	0.17	19.62	55.74	56.62	27.09	52.52	82.92
Ward Seed	18182	10.98	0.24	0.25	0.12	2.61	0.17	20.91	56.16	57.09	27.64	53.12	87.30
Ward Seed	19153	10.60	0.24	0.30	0.17	3.20	0.18	18.84	54.10	54.80	25.08	50.36	81.10
Ward Seed	19154	8.88	0.24	0.20	0.15	2.34	0.12	24.97	57.14	58.18	28.30	53.84	88.09
	Average	10.55	0.24	0.27	0.15	2.76	0.17	21.22	56.39	57.35	28.17	53.71	88.31

Values in bold are in the top least significant difference (LSD) group.

**Table 9. Silage performance test near Garden City
2019 Garden City, Kansas Silage Performance Test, Finney County**

Brand	Variety	Performance							
		Yield lb/DM/a	Harvest moisture %	Stand	Vigor	Flowering date	Days to harvest	Height in.	Lodging %
Forage sorghum									
Agrilead	AL-Brutis	17615	0.68	9.3	10.0	9/10/19	125	88	0
Agrilead	Bruitis	16290	0.71	9.0	9.3	9/10/19	116	98	0
Alta Seeds	ADV F7232	16730	0.69	10.0	9.7	9/10/19	125	73	0
Alta Seeds	ADV XF025	14323	0.66	9.7	10.0	8/5/19	116	95	0
Alta Seeds	ADV XF033	20280	0.65	10.0	10.0	8/15/19	125	81	0
Alta Seeds	AF7102	14530	0.68	10.0	10.0	8/5/19	116	79	0
Alta Seeds	AF7201	15404	0.64	9.7	10.0	8/5/19	116	98	0
Alta Seeds	AF7401	17475	0.66	10.0	10.0	9/10/19	125	71	0
Dyna-Gro Seed	F74FS72 BMR	15406	0.74	10.0	10.0	8/15/19	116	72	0
Dyna-Gro Seed	FX19125 BMR	14378	0.67	10.0	10.0	8/5/19	116	99	0
Dyna-Gro Seed	F72FS05	18972	0.67	10.0	9.7	8/15/19	125	81	0
Dyna-Gro Seed	FX19178 BMR	12468	0.71	9.7	10.0	8/15/19	116	65	0
Dyna-Gro Seed	FX19526 BMR	13557	0.68	9.3	9.7	8/15/19	116	66	0
Dyna-Gro Seed	Super Sile 20	17541	0.74	10.0	10.0	8/15/19	116	120	0
Dyna-Gro Seed	Super Sile 30	20048	0.75	10.0	10.0	8/15/19	116	119	0
Dyna-Gro Seed	TopTon	20295	0.71	9.7	10.0	9/10/19	125	112	32
Fontanelle	Nutri-Chomp	16955	0.74	9.7	10.0	9/10/19	125	120	17
KSU (check)	KS Orange	17095	0.68	10.0	10.0	8/15/19	116	111	0
MOJO	Opal	14224	0.73	9.7	9.7	8/15/19	116	86	0
Star Seed	Extreme BMR	13467	0.68	9.7	9.7	8/5/19	116	67	0
Star Seed	Packer	18528	0.72	10.0	10.0	8/15/19	116	93	0

continued

**Table 9. Silage performance test near Garden City
2019 Garden City, Kansas Silage Performance Test, Finney County**

Brand	Variety	Performance							
		Yield	Harvest moisture	Stand	Vigor	Flowering date	Days to harvest	Height	Lodging
		lb/DM/a	%					in.	%
Wards	18096	13232	0.68	9.7	9.7	8/5/19	116	67	0
Wards	18116	14148	0.67	9.3	9.7	8/5/19	116	97	0
Wards	18118	14906	0.67	10.0	10.0	8/5/19	116	97	0
Wards	19038	17787	0.70	10.0	10.0	9/10/19	125	80	0
Wards	19040	15961	0.67	10.0	10.0	8/26/19	125	69	0
Wards	19042	16702	0.75	10.0	10.0	9/10/19	125	101	0
Wards	19155	15733	0.69	10.0	9.7	8/5/19	116	83	0
Wards	19156	17586	0.60	10.0	10.0	8/5/19	116	104	0
Wards	19174	16617	0.67	10.0	10.0	8/26/19	125	99	15
Wards	19175	14739	0.65	9.3	10.0	8/5/19	116	86	0
Wards	19176	18347	0.67	9.7	9.7	8/15/19	116	93	0
Wards	19177	15671	0.66	10.0	10.0	8/15/19	116	89	15
Wards	19178	15179	0.70	10.0	9.7	8/15/19	116	102	0
Wards	19179	18550	0.68	10.0	10.0	9/10/19	125	80	0
Wards	19181	16058	0.70	10.0	10.0	9/10/19	125	82	0
Grain sorghum dual-purpose									
Dyna-Gro Seed	Dual Forage SCA II	15669	0.62	10.0	10.0	8/5/19	116	66	0
Dyna-Gro Seed	GX13692	15618	0.68	9.7	10.0	8/5/19	116	72	0
Average		16265	1	10	10		119	88	2
LSD (0.05)		2499							
Planting date: 5/17/2019									
Emergence date: 5/27/2019									

Values in bold are in the top least significant difference (LSD) group.

Table 9b. 2019 Garden City, Kansas Silage Performance Test, Finney County

Brand	Variety	Forage quality										
		CP	Adj_CP	NDFn	ADF	aNDFom	Lignin	uNDFom240	NDFD240	WSC (Sugar)	Starch	TFA (Fat)
----- % -----												
Agrilead	AL-Brutis	8.31	7.58	2.24	34.50	52.63	4.01	14.70	72.08	6.33	12.57	0.93
Agrilead	Bruitis	8.97	8.47	2.27	34.26	52.92	3.63	14.38	72.81	7.04	10.40	0.94
Alta Seeds	ADV F7232	8.54	7.90	2.06	36.49	52.03	3.64	15.68	69.79	3.11	13.22	0.91
Alta Seeds	ADV XF025	8.40	7.90	1.92	34.73	49.91	3.35	16.39	67.18	6.93	11.72	1.01
Alta Seeds	ADV XF033	7.75	6.93	1.97	36.60	54.22	4.74	17.21	68.27	3.03	15.45	0.95
Alta Seeds	AF7102	8.26	7.58	1.89	33.08	46.37	3.53	15.54	66.48	6.19	15.84	1.21
Alta Seeds	AF7201	8.57	8.18	1.81	34.82	48.99	3.52	16.06	67.23	6.87	12.32	1.02
Alta Seeds	AF7401	8.14	7.18	2.13	36.67	51.52	3.62	16.24	68.45	3.16	12.87	0.89
Dyna-Gro Seed	F74FS72 BMR	10.06	9.42	2.41	35.64	51.19	3.61	15.33	70.01	4.41	11.91	0.88
Dyna-Gro Seed	FX19125 BMR	8.36	7.98	1.94	35.55	50.42	3.88	16.51	67.26	7.71	11.11	1.06
Dyna-Gro Seed	F72FS05	8.07	7.23	2.03	36.07	52.57	4.62	17.01	67.58	3.20	16.11	0.97
Dyna-Gro Seed	FX19178 BMR	9.92	9.39	2.26	34.65	50.47	4.04	14.60	71.09	4.35	13.81	1.01
Dyna-Gro Seed	FX19526 BMR	9.20	8.78	1.93	34.29	50.27	3.76	14.33	71.50	3.20	15.10	1.10
Dyna-Gro Seed	Super Sile 20	8.51	7.95	2.11	37.11	54.55	4.48	18.43	66.22	7.51	10.83	0.82
Dyna-Gro Seed	Super Sile 30	8.78	8.22	2.17	37.33	54.02	4.35	18.14	66.41	6.19	10.81	0.84
Dyna-Gro Seed	TopTon	7.29	6.39	2.00	37.99	52.76	4.44	18.51	64.91	5.89	12.60	0.82
Fontanelle	Nutri-Chomp	7.29	6.81	1.96	36.37	55.77	3.74	15.41	72.35	13.00	5.91	0.77
KSU (check)	KS Orange	7.79	6.98	2.19	36.13	53.26	4.42	18.38	65.51	8.85	11.23	0.89
MOJO	Opal	9.65	9.25	2.23	35.54	51.05	4.28	18.31	64.13	4.83	12.87	1.04
Star Seed	Extreme BMR	9.37	8.97	1.90	32.55	46.94	3.60	13.56	71.12	2.42	18.01	1.23
Star Seed	Packer	8.58	8.00	2.08	35.29	50.69	4.31	16.63	67.17	5.15	14.53	1.00

continued

Table 9b. 2019 Garden City, Kansas Silage Performance Test, Finney County

Brand	Variety	Forage quality										
		CP	Adj_CP	NDFn	ADF	aNDFom	Lignin	uNDFom240	NDFD240	WSC (Sugar)	Starch	TFA (Fat)
----- % -----												
Wards	18096	9.27	8.82	1.87	34.53	48.27	4.14	16.08	66.62	2.52	16.95	1.12
Wards	18116	7.85	7.19	1.83	35.19	49.40	3.75	16.45	66.68	4.94	14.93	1.10
Wards	18118	8.50	8.06	1.95	34.26	49.12	3.61	16.52	66.35	7.67	13.02	1.07
Wards	19038	8.79	8.31	2.07	36.03	53.84	4.06	16.46	69.39	5.76	10.84	0.92
Wards	19040	8.87	8.42	1.97	36.46	52.11	4.11	15.93	69.42	5.91	10.94	0.96
Wards	19042	8.50	7.95	2.17	38.78	56.37	4.42	17.63	68.70	5.98	8.07	0.83
Wards	19155	8.68	8.15	1.86	31.85	44.76	3.26	14.77	67.01	7.45	15.60	1.19
Wards	19156	7.23	6.57	1.78	37.64	52.88	4.78	19.06	63.94	4.88	14.83	0.87
Wards	19174	8.20	7.77	1.82	35.89	51.14	3.42	16.67	67.37	5.65	11.69	0.96
Wards	19175	8.39	7.86	1.83	34.00	47.05	3.57	16.26	65.42	3.41	17.62	1.12
Wards	19176	7.63	7.01	2.00	38.61	56.03	4.87	19.58	65.07	4.54	12.34	0.81
Wards	19177	8.33	7.77	1.87	35.64	49.50	3.65	16.96	65.74	4.44	14.12	1.05
Wards	19178	8.89	8.23	2.14	35.54	49.80	3.53	16.87	66.12	3.16	15.03	0.95
Wards	19179	8.75	8.24	2.02	36.24	52.66	4.19	16.28	69.03	3.69	14.03	0.95
Wards	19181	9.12	8.68	2.04	34.56	50.19	3.25	15.66	68.80	5.70	12.44	1.02
Grain sorghum dual-purpose												
Dyna-Gro Seed	Dual Forage SCA II	8.64	8.08	1.70	33.75	46.91	4.07	15.40	67.16	1.62	20.57	1.14
Dyna-Gro Seed	GX13692	9.05	8.60	1.88	35.64	48.39	4.16	15.46	68.02	2.55	15.92	1.06
Average		8.54	7.97	2.01	35.53	51.08	3.96	16.40	67.85	5.24	13.37	0.99

Values in bold are in the top least significant difference (LSD) group.

Table 9b, continued. 2019 Garden City, Kansas Silage Performance Test, Finney County

Brand	Variety	Forage quality											
		Ash	Ca	P	Mg	K	S	NFC	TDN	NEL	NEG	NEM	RFV
----- % -----													
Forage sorghum													
Agrilead	AL-Brutis	10.48	0.24	0.21	0.19	2.26	0.14	28.88	58.59	59.79	30.49	56.24	106.80
Agrilead	Bruitis	10.92	0.24	0.22	0.17	2.22	0.15	27.53	58.84	60.07	31.15	56.95	106.74
Alta Seeds	ADV F7232	12.27	0.24	0.25	0.15	2.24	0.16	27.31	57.60	58.69	29.30	54.93	105.32
Alta Seeds	ADV XF025	12.08	0.24	0.23	0.13	2.11	0.17	29.53	59.07	60.33	31.24	57.05	112.51
Alta Seeds	ADV XF033	9.94	0.24	0.21	0.16	1.95	0.14	28.11	57.42	58.50	28.69	54.27	101.76
Alta Seeds	AF7102	11.64	0.25	0.23	0.14	2.00	0.16	33.40	60.30	61.70	32.77	58.73	123.50
Alta Seeds	AF7201	11.77	0.24	0.23	0.13	2.13	0.16	30.46	59.36	60.66	31.73	57.59	114.29
Alta Seeds	AF7401	12.46	0.25	0.24	0.16	2.25	0.16	28.12	57.43	58.51	28.82	54.41	105.87
Dyna-Gro Seed	F74FS72 BMR	12.71	0.27	0.26	0.18	2.43	0.18	26.57	57.38	58.45	29.58	55.24	108.56
Dyna-Gro Seed	FX19125 BMR	12.08	0.24	0.22	0.13	2.09	0.16	29.02	58.17	59.33	30.07	55.77	109.77
Dyna-Gro Seed	F72FS05	10.29	0.24	0.22	0.16	1.95	0.14	29.13	57.75	58.86	29.24	54.87	105.17
Dyna-Gro Seed	FX19178 BMR	12.14	0.25	0.25	0.18	2.29	0.17	27.71	57.61	58.70	29.88	55.57	111.99
Dyna-Gro Seed	FX19526 BMR	11.59	0.24	0.25	0.16	2.41	0.17	28.76	58.83	60.06	31.27	57.08	112.98
Dyna-Gro Seed	Super Sile 20	10.97	0.24	0.22	0.15	2.25	0.15	26.26	56.71	57.70	28.08	53.61	100.35
Dyna-Gro Seed	Super Sile 30	11.26	0.24	0.23	0.14	2.24	0.16	26.27	56.81	57.81	28.34	53.89	100.49
Dyna-Gro Seed	TopTon	11.40	0.24	0.22	0.14	2.26	0.13	28.74	56.74	57.73	27.55	53.03	101.63
Fontanelle	Nutri-Chomp	10.81	0.24	0.18	0.17	2.49	0.11	26.32	57.84	58.96	29.15	54.77	98.50
KSU (check)	KS Orange	9.63	0.24	0.19	0.13	1.79	0.14	29.62	58.51	59.71	30.17	55.88	103.63
MOJO	Opal	10.62	0.24	0.24	0.12	2.12	0.17	28.87	58.68	59.89	31.24	57.05	108.82
Star Seed	Extreme BMR	10.97	0.24	0.26	0.15	2.30	0.17	32.38	60.78	62.24	33.91	59.98	122.49
Star Seed	Packer	11.31	0.24	0.23	0.15	2.16	0.15	29.49	57.93	59.06	29.75	55.43	110.09

continued

Table 9b, continued. 2019 Garden City, Kansas Silage Performance Test, Finney County

Brand	Variety	Forage quality											
		Ash	Ca	P	Mg	K	S	NFC	TDN	NEL	NEG	NEM	RFV
----- % -----													
Wards	18096	11.27	0.24	0.26	0.12	2.13	0.17	30.94	59.07	60.32	31.57	57.42	117.27
Wards	18116	12.38	0.24	0.25	0.12	2.14	0.15	30.10	58.27	59.44	29.92	55.61	113.13
Wards	18118	11.74	0.24	0.23	0.13	2.10	0.16	30.51	59.26	60.54	31.55	57.39	115.47
Wards	19038	10.67	0.24	0.23	0.16	2.28	0.16	26.86	58.03	59.17	30.01	55.70	102.52
Wards	19040	11.37	0.24	0.23	0.16	2.17	0.16	27.67	57.80	58.91	29.74	55.41	105.22
Wards	19042	11.33	0.24	0.23	0.16	2.38	0.15	24.14	55.96	56.87	27.09	52.52	94.62
Wards	19155	12.14	0.24	0.26	0.13	2.23	0.16	34.09	60.76	62.21	33.58	59.61	129.34
Wards	19156	10.45	0.24	0.19	0.13	1.95	0.14	29.36	57.23	58.29	28.26	53.80	101.97
Wards	19174	11.98	0.24	0.23	0.13	2.26	0.16	28.54	58.68	59.90	30.65	56.41	107.95
Wards	19175	11.41	0.24	0.25	0.12	2.03	0.17	32.86	60.23	61.62	32.77	58.73	120.66
Wards	19176	10.13	0.24	0.19	0.12	2.04	0.14	26.40	56.47	57.43	27.40	52.86	95.50
Wards	19177	12.14	0.24	0.23	0.13	2.23	0.17	29.86	58.61	59.81	30.58	56.33	112.00
Wards	19178	11.79	0.24	0.25	0.12	2.22	0.17	29.71	58.90	60.14	31.15	56.96	111.22
Wards	19179	11.14	0.24	0.25	0.13	2.31	0.16	27.52	57.69	58.80	29.54	55.19	104.59
Wards	19181	11.67	0.24	0.25	0.15	2.34	0.17	29.05	59.58	60.89	32.21	58.11	111.63
Grain sorghum dual-purpose													
Dyna-Gro Seed	Dual Forage SCA II	10.34	0.24	0.24	0.13	1.96	0.16	33.67	60.44	61.86	33.12	59.11	120.93
Dyna-Gro Seed	GX13692	12.94	0.24	0.26	0.12	2.38	0.17	29.45	57.32	58.38	29.18	54.80	114.89
Average		11.37	0.24	0.23	0.14	2.19	0.16	29.03	58.33	59.51	30.28	56.01	109.21

Values in bold are in the top least significant difference (LSD) group.

**Table 10. Silage performance test near Hays
2019 Hays, Kansas Silage Performance Test, Ellis County**

Brand	Variety	Performance							
		Yield lb DM/a	Harvest moisture %	Stand	Vigor	Flowering date	Days to harvest	Height in.	Lodging %
Forage sorghum									
Alta Seeds	ADV F7232	10451	0.59	8.0	8.0	9/24/19	132	57	0
Alta Seeds	ADV XF025	12355	0.64	7.7	8.3	9/18/19	106	89	0
Alta Seeds	ADV XF033	16286	0.59	8.7	9.0	9/22/19	132	68	0
Alta Seeds	AF7102	9574	0.68	9.7	9.7	9/8/19	106	69	0
Alta Seeds	AF7201	9601	0.66	8.7	8.7	9/14/19	106	78	0
Alta Seeds	AF7401	14891	0.61	7.7	8.0	9/24/19	132	75	0
Dyna-Gro Seed	F74FS72 BMR	12285	0.65	8.7	8.7	9/20/19	132	65	0
Dyna-Gro Seed	FX19125 BMR	11577	0.66	8.3	8.3	9/18/19	112	86	5
Dyna-Gro Seed	F72FS05	15946	0.60	9.0	9.0	9/18/19	132	69	10
Dyna-Gro Seed	FX19178 BMR	10817	0.59	8.0	8.0	9/23/19	132	57	0
Dyna-Gro Seed	FX19526 BMR	10629	0.64	8.3	8.3	9/14/19	106	60	0
Dyna-Gro Seed	Super Sile 20	13578	0.62	8.3	8.3	9/18/19	132	86	0
Dyna-Gro Seed	Super Sile 30	15518	0.61	8.0	7.7	9/23/19	132	89	0
Dyna-Gro Seed	TopTon	16622	0.62	9.3	9.7	9/25/19	132	101	5
Fontanelle	Nutri-Chomp	9092	0.66	8.0	8.0	9/24/19	132	83	0
KSU (check)	KS Orange	12561	0.63	8.0	8.0	9/14/19	112	88	10
MOJO	Opal	13502	0.63	7.3	7.3	9/19/19	132	72	5
Star Seed	Extreme BMR	11182	0.67	8.0	8.0	9/8/19	106	59	0
Star Seed	Packer	13546	0.59	9.0	9.0	9/18/19	132	73	0
Wards	18118	9508	0.67	8.7	9.0	9/14/19	112	78	15
Wards	19038	15225	0.62	8.7	9.0	9/25/19	132	77	0
Wards	19040	9709	0.57	8.0	8.0	9/18/19	132	59	0
Wards	19042	12875	0.65	8.7	8.7	10/2/19	132	81	0
Wards	19155	11828	0.66	8.0	8.3	9/14/19	112	69	35

continued

**Table 10. Silage performance test near Hays
2019 Hays, Kansas Silage Performance Test, Ellis County**

Brand	Variety	Performance							
		Yield lb DM/a	Harvest moisture %	Stand	Vigor	Flowering date	Days to harvest	Height in.	Lodging %
Grain sorghum dual-purpose									
Dyna-Gro Seed	Dual Forage SCA II	10348	0.64	9.0	9.0	9/8/19	106	57	0
Dyna-Gro Seed	GX13692	10775	0.67	9.3	9.3	9/6/19	106	66	0
Average		12319	1	8	9		122	74	3
LSD (0.05)		4332							
Planting date: 6/6/2019									
Emergence date: 6/17/2019									

Values in bold are in the top least significant difference (LSD) group.

Table 10b. 2019 Hays, Kansas Silage Performance Test, Ellis County

Brand	Variety	Forage quality										
		CP	Adj_CP	NDFn	ADF	aNDFom	Lignin	uNDFom240	NDFD240	WSC (Sugar)	Starch	TFA (Fat)
----- % -----												
Forage sorghum												
Alta Seeds	ADV F7232	7.27	6.83	1.41	28.00	41.95	3.08	14.37	65.77	8.99	24.14	1.26
Alta Seeds	ADV XF025	6.84	6.38	1.59	31.34	47.34	3.57	14.56	69.06	7.12	19.43	1.21
Alta Seeds	ADV XF033	6.33	5.68	1.29	32.63	48.51	4.28	17.25	64.45	7.10	20.86	1.16
Alta Seeds	AF7102	6.93	6.30	1.94	34.60	52.78	3.99	15.73	70.08	9.03	13.42	0.93
Alta Seeds	AF7201	6.59	6.10	1.67	32.66	48.65	3.59	15.03	69.10	7.89	17.23	1.09
Alta Seeds	AF7401	6.13	5.83	0.90	30.16	44.56	2.51	16.31	63.20	11.53	21.47	1.18
Dyna-Gro Seed	F74FS72 BMR	6.85	6.50	1.34	33.73	49.35	3.24	16.66	66.16	10.62	15.53	0.95
Dyna-Gro Seed	FX19125 BMR	6.38	5.91	1.63	31.46	48.45	3.46	16.64	65.67	9.61	17.94	1.06
Dyna-Gro Seed	F72FS05	7.07	6.53	1.34	36.70	53.33	4.64	18.81	64.76	6.70	17.00	0.98
Dyna-Gro Seed	FX19178 BMR	6.08	5.48	1.25	33.66	47.96	3.46	15.99	66.46	8.21	18.29	1.01
Dyna-Gro Seed	FX19526 BMR	7.31	6.67	1.79	31.53	47.47	3.79	13.66	71.18	4.57	21.40	1.18
Dyna-Gro Seed	Super Sile 20	6.32	5.83	1.11	36.14	51.40	3.91	19.98	61.14	11.57	15.90	0.92
Dyna-Gro Seed	Super Sile 30	7.18	6.72	1.31	36.06	51.27	4.56	19.29	62.34	9.12	17.03	0.93
Dyna-Gro Seed	TopTon	6.16	5.94	0.94	34.46	49.26	3.58	18.88	61.63	13.40	16.60	0.98
Fontanelle	Nutri-Chomp	6.27	5.94	1.58	34.54	53.94	3.21	15.27	71.68	15.34	8.52	0.75
KSU (check)	KS Orange	6.10	5.39	1.88	31.90	49.81	3.77	16.27	67.35	12.28	15.79	0.95
MOJO	Opal	7.51	7.29	1.41	35.28	51.18	3.90	18.30	63.74	9.96	14.04	0.93
Star Seed	Extreme BMR	6.49	5.70	1.83	33.42	50.93	3.68	14.26	71.85	6.36	17.10	1.03
Star Seed	Packer	7.19	6.99	1.06	29.36	43.40	3.25	16.24	62.40	10.22	22.59	1.26
Wards	18118	6.11	5.56	1.67	33.68	49.72	3.56	15.96	67.80	10.31	14.93	0.95
Wards	19038	6.24	6.13	1.12	35.92	52.74	3.46	19.14	63.71	15.37	10.18	0.77
Wards	19040	7.71	7.67	1.12	32.84	47.54	3.52	17.73	62.69	8.77	18.74	1.11
Wards	19042	6.67	6.39	1.41	36.67	53.88	4.00	18.84	65.10	14.73	8.61	0.71
Wards	19155	7.02	6.39	1.71	31.14	44.06	3.55	15.29	65.28	6.76	21.20	1.15
Grain sorghum dual-purpose												
Dyna-Gro Seed	Dual Forage SCA II	7.25	6.59	1.65	31.57	45.17	4.34	15.09	66.54	2.88	25.61	1.23
Dyna-Gro Seed	GX13692	7.65	7.09	1.80	32.69	46.68	4.31	15.13	67.39	3.31	22.92	1.15
Average		6.76	6.30	1.45	33.16	48.90	3.70	16.56	66.02	9.30	17.56	1.03

Values in bold are in the top least significant difference (LSD) group.

Table 10b, continued. 2019 Hays, Kansas Silage Performance Test, Ellis County

Brand	Variety	Forage quality											
		Ash	Ca	P	Mg	K	S	NFC	TDN	NEL	NEG	NEM	RFV
----- % -----													
Forage sorghum													
Alta Seeds	ADV F7232	7.17	0.24	0.23	0.13	1.24	0.11	42.76	66.89	69.04	40.90	67.71	146.64
Alta Seeds	ADV XF025	8.75	0.24	0.23	0.12	1.50	0.11	36.45	62.99	64.70	35.75	62.02	126.54
Alta Seeds	ADV XF033	7.17	0.24	0.22	0.12	1.59	0.10	37.11	62.81	64.49	35.28	61.49	119.42
Alta Seeds	AF7102	10.08	0.24	0.22	0.12	1.76	0.11	30.23	59.09	60.35	30.63	56.39	107.89
Alta Seeds	AF7201	9.10	0.24	0.22	0.12	1.62	0.10	35.24	62.13	63.74	34.53	60.67	118.93
Alta Seeds	AF7401	7.58	0.24	0.27	0.12	1.45	0.10	40.44	66.73	68.86	40.29	67.05	134.69
Dyna-Gro Seed	F74FS72 BMR	8.73	0.24	0.24	0.12	1.66	0.11	34.45	62.70	64.38	35.42	61.64	115.53
Dyna-Gro Seed	FX19125 BMR	8.17	0.24	0.20	0.12	1.42	0.11	36.57	63.29	65.03	35.96	62.25	121.28
Dyna-Gro Seed	F72FS05	7.70	0.24	0.25	0.12	1.76	0.11	31.25	60.10	61.48	32.04	57.93	104.03
Dyna-Gro Seed	FX19178 BMR	9.37	0.24	0.23	0.12	1.66	0.11	35.83	62.07	63.67	34.23	60.34	119.45
Dyna-Gro Seed	FX19526 BMR	8.63	0.24	0.23	0.12	1.64	0.11	36.20	62.56	64.21	35.35	61.57	123.62
Dyna-Gro Seed	Super Sile 20	7.77	0.24	0.26	0.12	1.63	0.11	33.70	61.78	63.35	33.97	60.05	107.42
Dyna-Gro Seed	Super Sile 30	7.74	0.24	0.24	0.12	1.64	0.11	33.20	60.81	62.26	33.03	59.02	108.62
Dyna-Gro Seed	TopTon	7.60	0.24	0.25	0.12	1.53	0.10	35.94	63.37	65.12	36.07	62.35	114.35
Fontanelle	Nutri-Chomp	7.55	0.24	0.20	0.13	1.71	0.10	32.08	62.56	64.21	35.01	61.19	104.71
KSU (check)	KS Orange	7.33	0.24	0.17	0.12	1.12	0.10	36.70	63.03	64.74	35.47	61.70	117.02
MOJO	Opal	7.89	0.24	0.25	0.12	1.56	0.12	32.91	61.89	63.47	34.60	60.76	111.01
Star Seed	Extreme BMR	9.16	0.24	0.22	0.13	1.90	0.11	33.22	61.06	62.55	32.98	58.98	114.56
Star Seed	Packer	6.76	0.24	0.25	0.13	1.26	0.10	41.45	66.65	68.76	40.62	67.41	139.56
Wards	18118	9.94	0.24	0.21	0.12	1.63	0.10	33.95	60.90	62.36	32.68	58.64	116.63
Wards	19038	7.51	0.24	0.24	0.12	1.47	0.10	32.86	62.59	64.24	35.14	61.33	104.85
Wards	19040	7.62	0.24	0.27	0.12	1.41	0.12	36.14	64.08	65.91	37.62	64.08	121.11
Wards	19042	7.49	0.24	0.19	0.12	1.51	0.12	31.66	61.14	62.64	33.32	59.34	101.73
Wards	19155	10.02	0.24	0.25	0.12	1.62	0.11	38.46	62.59	64.25	35.28	61.48	132.80
Grain sorghum dual-purpose													
Dyna-Gro Seed	Dual Forage SCA II	8.18	0.24	0.25	0.12	1.67	0.11	38.82	62.80	64.48	35.65	61.89	128.66
Dyna-Gro Seed	GX13692	9.21	0.24	0.25	0.12	1.79	0.12	36.11	61.36	62.88	33.93	60.01	124.57
Average		8.24	0.24	0.23	0.12	1.57	0.11	35.53	62.61	64.28	35.22	61.43	118.68

Values in bold are in the top least significant difference (LSD) group.

**Table 11. Silage performance test near Scandia
2019 Scandia, Kansas Silage Performance Test, Republic County**

Brand	Variety	Performance							
		Yield lb DM/a	Harvest moisture %	Stand	Vigor	Flowering date	Days to harvest	Height in.	Lodging %
Forage sorghum									
Alta Seeds	ADV F7232	9458	0.78	10.0	10.0	9/10/19	116	78	0
Alta Seeds	ADV XF025	7197	0.75	10.0	10.0	8/20/19	89	109	0
Alta Seeds	ADV XF033	10766	0.73	10.0	10.0	9/10/19	116	92	0
Alta Seeds	AF7102	6638	0.80	9.0	9.7	8/20/19	89	86	0
Alta Seeds	AF7201	7937	0.75	10.0	10.0	8/20/19	89	105	0
Alta Seeds	AF7401	9812	0.78	10.0	10.0	9/14/19	116	79	0
Dyna-Gro Seed	F74FS72 BMR	11903	0.74	10.0	10.0	9/14/19	116	77	0
Dyna-Gro Seed	FX19125 BMR	6907	0.74	10.0	10.0	8/20/19	89	111	0
Dyna-Gro Seed	F72FS05	10895	0.73	9.7	10.0	9/10/19	116	89	0
Dyna-Gro Seed	FX19178 BMR	8807	0.72	9.7	10.0	9/3/19	116	70	0
Dyna-Gro Seed	FX19526 BMR	7082	0.76	10.0	10.0	8/27/19	104	72	0
Dyna-Gro Seed	Super Sile 20	9486	0.76	10.0	10.0	9/3/19	116	127	3
Dyna-Gro Seed	Super Sile 30	8818	0.76	10.0	10.0	9/10/19	116	137	7
Dyna-Gro Seed	TopTon	7401	0.74	9.7	10.0	9/10/19	116	142	20
KSU (check)	KS Orange	30330	0.70	8.7	10.0	8/27/19	104	120	17
MOJO	Opal	5308	0.76	7.3	9.0	9/6/19	116	99	0
Star Seed	Extreme BMR	7438	0.76	10.0	10.0	8/27/19	104	74	0
Star Seed	Packer	9811	0.76	10.0	10.0	9/3/19	116	105	0

continued

**Table 11. Silage performance test near Scandia
2019 Scandia, Kansas Silage Performance Test, Republic County**

Brand	Variety	Performance							
		Yield lb DM/a	Harvest moisture %	Stand	Vigor	Flowering date	Days to harvest	Height in.	Lodging %
Wards	18096	9854	0.77	10.0	10.0	8/27/19	89	69	0
Wards	18116	7885	0.76	9.7	10.0	8/27/19	89	106	0
Wards	18118	8373	0.74	10.0	10.0	8/20/19	89	107	0
Wards	19038	9482	0.76	9.7	10.0	9/14/19	116	93	0
Wards	19040	9789	0.75	10.0	10.0	9/10/19	116	78	0
Wards	19042	7450	0.79	9.7	10.0	9/17/19	116	109	0
Wards	19155	7972	0.77	10.0	10.0	8/23/19	104	102	63
Wards	19156	8088	0.72	10.0	10.0	8/27/19	89	124	43
Wards	19174	8738	0.73	10.0	10.0	9/3/19	104	102	23
Wards	19175	6863	0.75	8.3	9.0	8/20/19	89	101	0
Wards	19176	8973	0.69	9.7	10.0	8/27/19	104	119	7
Wards	19177	6270	0.72	9.7	10.0	8/27/19	104	105	7
Wards	19178	5618	0.74	9.3	10.0	8/27/19	104	108	23
Wards	19179	9867	0.75	10.0	10.0	9/3/19	116	89	0
Wards	19181	7299	0.76	9.0	10.0	9/10/19	116	91	0
Grain sorghum dual-purpose									
Dyna-Gro Seed	Dual Forage SCA II	8094	0.75	9.3	9.7	8/20/19	89	70	0
Dyna-Gro Seed	GX13692	7822	0.78	10.0	10.0	8/27/19	89	87	0
Average		8984	1	10	10		105	98	6
LSD (0.05)		2116							
Planting date: 6/14/2019									
Emergence date: 6/18/2019									

Values in bold are in the top least significant difference (LSD) group.

Table 11b. 2019 Scandia, Kansas Silage Performance Test, Republic County

Brand	Variety	Forage quality								WSC (Sugar)	Starch	TFA (Fat)
		CP	Adj_CP	NDFn	ADF	aNDFom	Lignin	uNDFom240	NDFD240			
----- % -----												
Forage sorghum												
Alta Seeds	ADV F7232	8.49	8.22	2.00	41.71	59.91	3.81	14.75	75.38	5.78	1.30	0.70
Alta Seeds	ADV XF025	9.13	9.05	2.25	38.47	59.03	4.13	16.11	72.71	9.15	2.43	0.90
Alta Seeds	ADV XF033	7.63	7.22	1.93	40.18	61.04	5.12	17.95	70.53	6.37	5.46	0.78
Alta Seeds	AF7102	8.98	8.90	2.21	35.06	53.13	3.37	14.24	73.20	11.35	4.89	1.03
Alta Seeds	AF7201	9.41	9.23	2.26	37.68	55.51	3.77	15.38	72.29	7.39	4.29	0.99
Alta Seeds	AF7401	8.57	8.29	2.08	41.76	60.37	3.69	14.73	75.57	5.40	1.23	0.65
Dyna-Gro Seed	F74FS72 BMR	8.97	8.70	2.10	36.60	55.08	3.55	14.72	73.23	5.71	7.36	0.89
Dyna-Gro Seed	FX19125 BMR	9.86	9.86	2.28	36.22	55.49	3.82	15.51	72.05	9.20	4.10	1.05
Dyna-Gro Seed	F72FS05	6.71	6.21	1.83	42.58	63.87	5.50	19.03	70.20	6.24	3.97	0.66
Dyna-Gro Seed	FX19178 BMR	8.58	8.27	1.94	36.47	54.42	4.02	14.97	72.47	8.81	7.05	0.90
Dyna-Gro Seed	FX19526 BMR	9.67	9.55	2.21	37.86	57.40	4.05	12.99	77.37	5.98	3.64	0.95
Dyna-Gro Seed	Super Sile 20	6.17	5.66	1.69	39.74	58.61	4.75	18.04	69.22	13.13	4.24	0.65
Dyna-Gro Seed	Super Sile 30	6.84	6.41	1.81	40.59	59.33	4.92	18.45	68.90	12.48	3.13	0.63
Dyna-Gro Seed	TopTon	5.95	5.34	1.81	40.57	57.64	4.52	18.61	67.70	14.32	3.06	0.56
KSU (check)	KS Orange	6.95	6.55	1.98	37.31	55.50	3.78	17.21	69.00	13.85	4.50	0.66
MOJO	Opal	8.16	7.89	2.13	36.29	53.38	3.73	16.91	68.32	14.77	2.94	0.71
Star Seed	Extreme BMR	9.80	9.70	2.21	37.04	56.30	4.20	13.06	76.80	6.42	4.10	1.02
Star Seed	Packer	5.96	5.55	1.72	42.56	61.86	4.98	18.02	70.86	10.64	1.83	0.67

continued

Table 11b. 2019 Scandia, Kansas Silage Performance Test, Republic County

Brand	Variety	Forage quality								WSC (Sugar)	Starch	TFA (Fat)
		CP	Adj_CP	NDFn	ADF	aNDFom	Lignin	uNDFom240	NDFD240			
----- % -----												
Wards	18096	11.18	11.18	2.51	36.00	56.79	4.44	14.80	73.93	8.12	2.87	1.07
Wards	18116	8.04	7.82	2.09	38.57	56.27	3.80	15.30	72.80	11.79	2.18	0.81
Wards	18118	7.79	7.72	1.92	37.26	55.60	3.70	15.43	72.25	13.73	2.75	0.87
Wards	19038	7.19	6.88	1.85	39.93	60.47	4.55	17.03	71.85	10.57	2.69	0.68
Wards	19040	8.02	7.89	2.01	38.20	57.66	4.21	16.09	72.07	11.33	2.26	0.78
Wards	19042	6.20	5.80	1.88	41.09	61.61	4.62	17.35	71.81	13.19	0.71	0.59
Wards	19155	8.20	7.98	2.04	35.33	52.34	3.45	14.54	72.23	15.16	3.44	0.89
Wards	19156	10.22	10.19	2.39	38.75	58.51	4.52	16.25	72.23	9.03	2.02	0.82
Wards	19174	7.25	6.76	2.02	40.43	58.28	3.58	14.96	74.32	8.33	2.90	0.70
Wards	19175	9.74	9.48	2.33	37.09	53.38	4.13	16.27	69.64	7.80	4.77	0.90
Wards	19176	6.14	5.67	1.79	42.85	63.21	5.40	20.26	67.95	10.53	2.84	0.61
Wards	19177	7.07	6.84	1.84	38.41	56.52	3.75	16.65	70.54	12.28	3.13	0.81
Wards	19178	7.58	7.15	2.08	42.96	60.79	4.41	17.31	71.53	6.51	1.30	0.74
Wards	19179	9.02	8.90	2.10	38.22	58.11	4.31	15.58	73.19	8.25	3.87	0.85
Wards	19181	7.56	7.40	1.86	35.70	53.58	3.13	14.36	73.20	14.02	3.68	0.84
Grain sorghum dual-purpose												
Dyna-Gro Seed	Dual Forage SCA II	10.57	10.57	2.37	37.52	57.62	4.93	15.84	72.48	6.97	4.85	0.97
Dyna-Gro Seed	GX13692	10.69	10.69	2.45	37.02	57.54	4.51	15.26	73.48	8.22	2.53	1.03
Average		8.24	7.99	2.06	38.69	57.60	4.20	16.11	72.04	9.79	3.38	0.81

Values in bold are in the top least significant difference (LSD) group.

Table 11b, continued. 2019 Scandia, Kansas Silage Performance Test, Republic County

Brand	Variety	Forage quality											
		Ash	Ca	P	Mg	K	S	NFC	TDN	NEL	NEG	NEM	RFV
----- % -----													
Forage sorghum													
Alta Seeds	ADV F7232	13.07	0.24	0.28	0.12	2.81	0.17	18.83	54.30	55.02	24.88	50.14	85.42
Alta Seeds	ADV XF025	10.48	0.24	0.22	0.13	2.18	0.17	21.71	56.92	57.93	28.79	54.37	91.09
Alta Seeds	ADV XF033	9.42	0.24	0.20	0.13	1.89	0.13	22.06	55.39	56.23	25.97	51.32	86.49
Alta Seeds	AF7102	10.96	0.24	0.25	0.13	2.48	0.16	27.10	59.57	60.88	32.25	58.15	105.04
Alta Seeds	AF7201	11.32	0.24	0.26	0.13	2.48	0.17	24.03	57.70	58.81	29.90	55.59	98.08
Alta Seeds	AF7401	12.70	0.24	0.28	0.12	2.62	0.16	18.79	54.70	55.46	25.45	50.75	84.54
Dyna-Gro Seed	F74FS72 BMR	11.54	0.24	0.27	0.12	2.11	0.16	24.62	57.81	58.92	29.83	55.51	99.96
Dyna-Gro Seed	FX19125 BMR	10.57	0.24	0.25	0.13	2.31	0.17	24.32	58.56	59.76	31.29	57.11	99.57
Dyna-Gro Seed	F72FS05	9.09	0.24	0.19	0.12	1.96	0.12	20.49	54.13	54.83	23.82	49.00	80.01
Dyna-Gro Seed	FX19178 BMR	11.22	0.24	0.24	0.14	2.18	0.15	25.82	57.47	58.55	29.19	54.82	102.31
Dyna-Gro Seed	FX19526 BMR	12.27	0.24	0.26	0.17	2.91	0.18	20.91	55.71	56.59	27.35	52.82	93.95
Dyna-Gro Seed	Super Sile 20	8.72	0.24	0.17	0.12	1.97	0.11	26.54	57.23	58.28	27.87	53.37	89.54
Dyna-Gro Seed	Super Sile 30	9.04	0.24	0.19	0.12	2.16	0.12	24.97	56.43	57.38	27.07	52.51	87.23
Dyna-Gro Seed	TopTon	9.03	0.24	0.17	0.12	1.72	0.10	27.63	57.47	58.55	28.07	53.59	90.47
KSU (check)	KS Orange	8.77	0.24	0.17	0.12	1.61	0.12	29.11	59.80	61.14	31.64	57.49	97.71
MOJO	Opal	9.70	0.24	0.20	0.13	1.74	0.13	29.19	59.66	60.99	31.97	57.85	103.26
Star Seed	Extreme BMR	11.55	0.24	0.26	0.17	2.78	0.17	22.54	56.57	57.54	28.57	54.14	97.38
Star Seed	Packer	10.21	0.24	0.20	0.12	2.26	0.11	22.01	54.57	55.31	24.17	49.37	81.86

continued

Table 11b, continued. 2019 Scandia, Kansas Silage Performance Test, Republic County

Brand	Variety	Forage quality											
		Ash	Ca	P	Mg	K	S	NFC	TDN	NEL	NEG	NEM	RFV
----- % -----													
Wards	18096	9.94	0.24	0.25	0.16	2.61	0.19	22.53	57.84	58.95	30.92	56.70	97.81
Wards	18116	11.00	0.24	0.22	0.13	2.23	0.15	24.97	57.59	58.68	29.18	54.81	95.06
Wards	18118	10.39	0.24	0.22	0.12	2.23	0.14	26.26	58.69	59.91	30.62	56.37	97.94
Wards	19038	8.80	0.24	0.21	0.12	2.08	0.12	23.71	57.07	58.10	28.11	53.64	86.33
Wards	19040	9.99	0.24	0.20	0.12	2.04	0.13	24.56	57.48	58.55	29.06	54.66	93.39
Wards	19042	8.50	0.24	0.19	0.12	2.08	0.10	23.97	56.86	57.86	27.39	52.85	84.18
Wards	19155	10.46	0.24	0.22	0.13	2.23	0.14	29.15	59.91	61.27	32.35	58.27	106.10
Wards	19156	9.95	0.24	0.23	0.16	2.24	0.16	21.88	56.81	57.81	29.08	54.69	90.90
Wards	19174	11.53	0.24	0.23	0.12	2.33	0.15	23.27	56.67	57.65	27.53	53.01	89.20
Wards	19175	10.78	0.37	0.23	0.17	2.23	0.17	26.53	58.12	59.27	30.49	56.26	102.51
Wards	19176	8.86	0.24	0.15	0.12	1.87	0.11	21.96	54.72	55.48	24.42	49.64	80.73
Wards	19177	10.52	0.24	0.19	0.12	1.91	0.14	25.93	58.10	59.24	29.46	55.11	95.20
Wards	19178	12.66	0.24	0.25	0.12	2.43	0.15	19.31	53.46	54.08	23.30	48.42	82.86
Wards	19179	10.43	0.24	0.25	0.12	2.32	0.16	22.69	56.80	57.80	28.54	54.11	93.13
Wards	19181	10.26	0.24	0.21	0.12	2.04	0.13	28.61	60.30	61.70	32.62	58.56	103.40
Grain sorghum dual-purpose													
Dyna-Gro Seed	Dual Forage SCA II	10.21	0.24	0.25	0.16	2.51	0.17	22.01	56.32	57.27	28.58	54.15	94.51
Dyna-Gro Seed	GX13692	10.34	0.24	0.25	0.17	2.63	0.18	21.86	57.06	58.09	29.67	55.34	95.30
Average		10.41	0.24	0.22	0.13	2.23	0.14	24.00	57.08	58.11	28.56	54.13	93.21

Values in bold are in the top least significant difference (LSD) group.

**Table 12. Corn silage performance test near Garden City
2019 Garden City, Kansas Corn Silage Performance Test, Finney County**

Brand	Variety	Performance							
		Yield lb DM/a	Harvest moisture %	Stand	Vigor	Flowering date	Days to harvest	Height in.	Lodging %
Dyna-Gro Seed	D54DC94	17468	0.62	9.5	10.0	7/12/19	116	97	0
Dyna-Gro Seed	D55QC73	17871	0.64	10.0	10.0	7/12/19	116	102	0
Dyna-Gro Seed	D57VC75	18301	0.51	9.7	10.0	7/16/19	125	97	0
Dyna-Gro Seed	D58VC65	17461	0.59	10.0	10.0	7/16/19	116	89	0
Dyna-Gro Seed	D58QC72	18397	0.62	9.7	10.0	7/16/19	116	98	0
Dyna-Gro Seed	D58RR70	15731	0.63	10.0	9.3	7/16/19	116	101	0
Average		17538	1	10	10	-	118	97	0
LSD (0.05)		986							
Planting date: 5/17/2019									
Emergence date: 5/27/2019									

Values in bold are in the top least significant difference (LSD) group.

Table 12b. 2019 Garden City, Kansas Corn Silage Performance Test, Finney County

Brand	Variety	Forage quality										
		CP	Adj_CP	NDFn	ADF	aNDFom	Lignin	uNDFom240	NDFD240	WSC (Sugar)	Starch	TFA (Fat)
							(%)					
Dyna-Gro Seed	D54DC94	8.98	8.98	1.42	26.74	43.48	3.65	12.66	70.87	5.37	27.64	1.94
Dyna-Gro Seed	D55QC73	9.38	9.38	1.50	26.09	42.31	3.63	12.43	70.64	6.59	26.40	2.00
Dyna-Gro Seed	D57VC75	8.38	8.38	1.30	28.44	47.38	3.84	13.57	71.38	6.13	23.70	1.78
Dyna-Gro Seed	D58VC65	8.97	8.97	1.41	25.06	41.22	3.60	12.03	70.87	5.21	29.97	2.13
Dyna-Gro Seed	D58QC72	9.13	9.13	1.38	23.91	39.45	3.35	11.42	71.03	5.92	30.95	2.28
Dyna-Gro Seed	D58RR70	8.94	8.94	1.39	26.35	42.94	3.51	12.15	71.64	5.76	28.33	1.98
Average		8.96	8.96	1.40	26.10	42.80	3.60	12.38	71.07	5.83	27.83	2.02
Brand	Variety	Forage quality										
		Ash	Ca	P	Mg	K	S	NFC	TDN	NEL	NEG	NEM
Dyna-Gro Seed	D54DC94	6.86	0.30	0.25	0.19	1.29	0.12	39.15	66.84	68.98	41.68	68.59
Dyna-Gro Seed	D55QC73	7.10	0.32	0.25	0.20	1.30	0.13	39.70	67.03	69.20	42.07	69.02
Dyna-Gro Seed	D57VC75	6.75	0.31	0.23	0.21	1.34	0.12	36.01	65.32	67.29	39.52	66.18
Dyna-Gro Seed	D58VC65	6.63	0.30	0.25	0.19	1.24	0.13	41.47	67.99	70.26	43.09	70.17
Dyna-Gro Seed	D58QC72	6.62	0.29	0.25	0.18	1.28	0.12	42.90	69.16	71.56	44.63	71.89
Dyna-Gro Seed	D58RR70	6.64	0.29	0.24	0.18	1.24	0.13	39.89	67.52	69.74	42.52	69.53
Average		6.77	0.30	0.25	0.19	1.28	0.13	39.86	67.31	69.50	42.25	69.23

Values in bold are in the top least significant difference (LSD) group.

**Table 13. Corn silage performance test near Hays
2019 Hays, Kansas Corn Silage Performance Test, Ellis County**

Brand	Variety	Performance							
		Yield lb DM/a	Harvest moisture %	Stand	Vigor	Flowering date	Days to harvest	Height in.	Lodging %
Dyna-Gro Seed	D54DC94	10426	0.58	9.0	9.0	7/30/19	104	62	10
Dyna-Gro Seed	D55QC73	9722	0.65	9.0	9.0	8/3/19	104	72	25
Dyna-Gro Seed	D57VC75	9698	0.62	8.7	8.3	8/3/19	104	74	27
Dyna-Gro Seed	D58VC65	8433	0.61	9.0	9.0	8/3/19	104	62	33
Dyna-Gro Seed	D58QC72	10830	0.63	9.3	9.3	8/3/19	104	72	33
Dyna-Gro Seed	D58RR70	10894	0.64	8.3	8.7	8/8/19	104	75	25
Average		10000	0.62	9	9	-	104	70	26
LSD (0.05)		1250							
Planting Date: 6/6/2019									
Emergence Date: 6/17/2019									

Values in bold are in the top least significant difference (LSD) group.

Table 13b. 2019 Hays, Kansas Silage Performance Test, Ellis County

Brand	Variety	Forage quality								WSC (Sugar)	Starch	TFA (Fat)
		CP	Adj_CP	NDFn	ADF	aNDFom	Lignin	uNDFom240	NDFD240			
							%					
Dyna-Gro Seed	D54DC94	7.17	7.17	1.08	25.67	42.38	3.25	12.45	70.57	5.58	32.17	1.95
Dyna-Gro Seed	D55QC73	6.89	6.77	1.23	30.46	48.60	3.81	14.77	69.52	6.71	21.34	1.37
Dyna-Gro Seed	D57VC75	7.08	7.03	1.18	28.16	46.80	3.38	13.00	72.09	7.26	23.61	1.82
Dyna-Gro Seed	D58VC65	7.35	7.35	1.17	27.03	44.60	3.49	13.28	70.20	6.23	27.90	1.83
Dyna-Gro Seed	D58QC72	6.73	6.73	1.01	28.82	47.63	3.44	13.00	72.53	4.76	29.16	1.88
Dyna-Gro Seed	D58RR70	6.88	6.87	1.00	28.50	46.55	3.32	12.52	73.11	5.51	27.74	1.87
Average		7.02	6.99	1.11	28.11	46.09	3.45	13.17	71.34	6.01	26.99	1.79
Brand	Variety	Forage quality										
		Ash	Ca	P	Mg	K	S	NFC	TDN	NEL	NEG	NEM
Dyna-Gro Seed	D54DC94	6.09	0.24	0.23	0.16	1.14	0.10	42.49	68.69	71.04	43.29	70.40
Dyna-Gro Seed	D55QC73	6.54	0.26	0.22	0.16	1.18	0.11	36.84	64.77	66.68	38.20	64.72
Dyna-Gro Seed	D57VC75	6.57	0.28	0.22	0.20	1.15	0.11	37.91	66.49	68.59	40.47	67.24
Dyna-Gro Seed	D58VC65	6.25	0.26	0.23	0.17	1.13	0.11	40.14	67.29	69.49	41.61	68.52
Dyna-Gro Seed	D58QC72	5.58	0.23	0.20	0.15	1.15	0.10	38.19	67.30	69.50	41.42	68.30
Dyna-Gro Seed	D58RR70	6.20	0.23	0.21	0.15	1.16	0.10	38.50	67.15	69.33	41.26	68.13
Average		6.20	0.25	0.22	0.17	1.15	0.11	39.01	66.95	69.10	41.04	67.88

Values in bold are in the top least significant difference (LSD) group.

FORAGE REPORT 2019

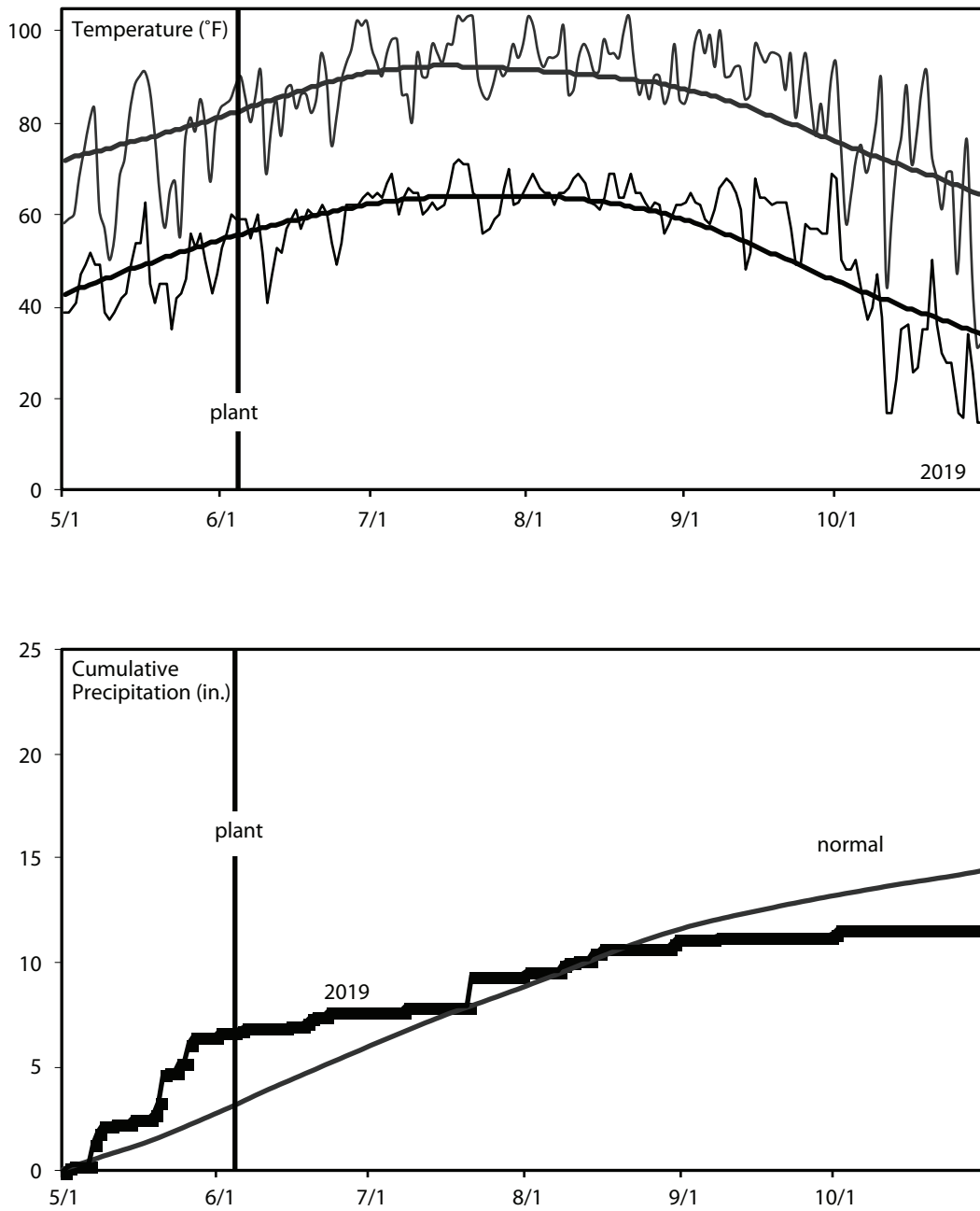


Figure 1. Precipitation and temperature during the 2019 growing season near Garden City, KS. Top pane: daily and mean (1981 to 2019) high and low temperature. Bottom pane: daily and mean (1981 to 2019) cumulative precipitation.

FORAGE REPORT 2019

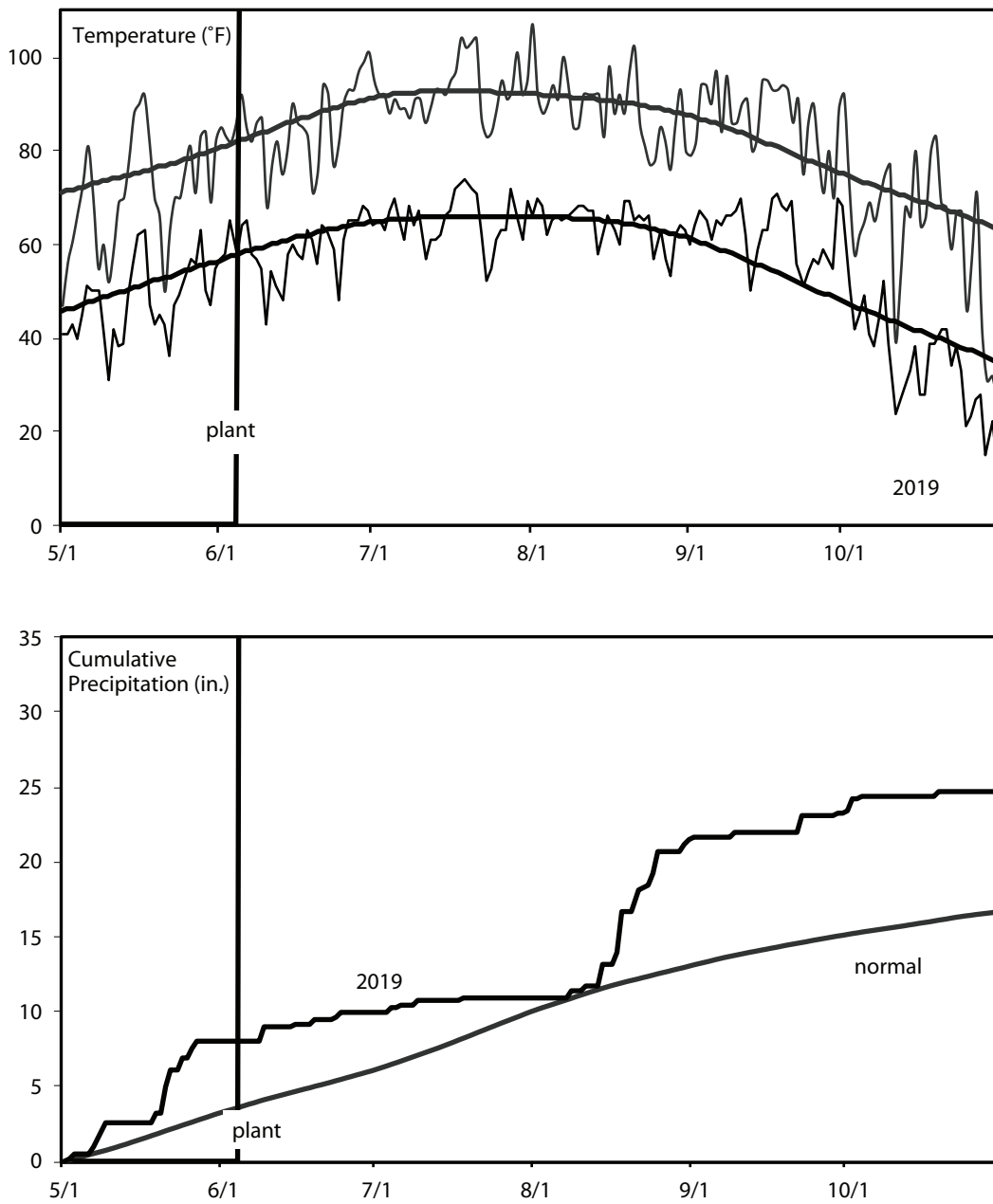


Figure 2. Precipitation and temperature during the 2019 growing season near Hays, KS. Top pane: daily and mean (1981 to 2019) high and low temperature. Bottom pane: daily and mean (1981 to 2019) cumulative precipitation.

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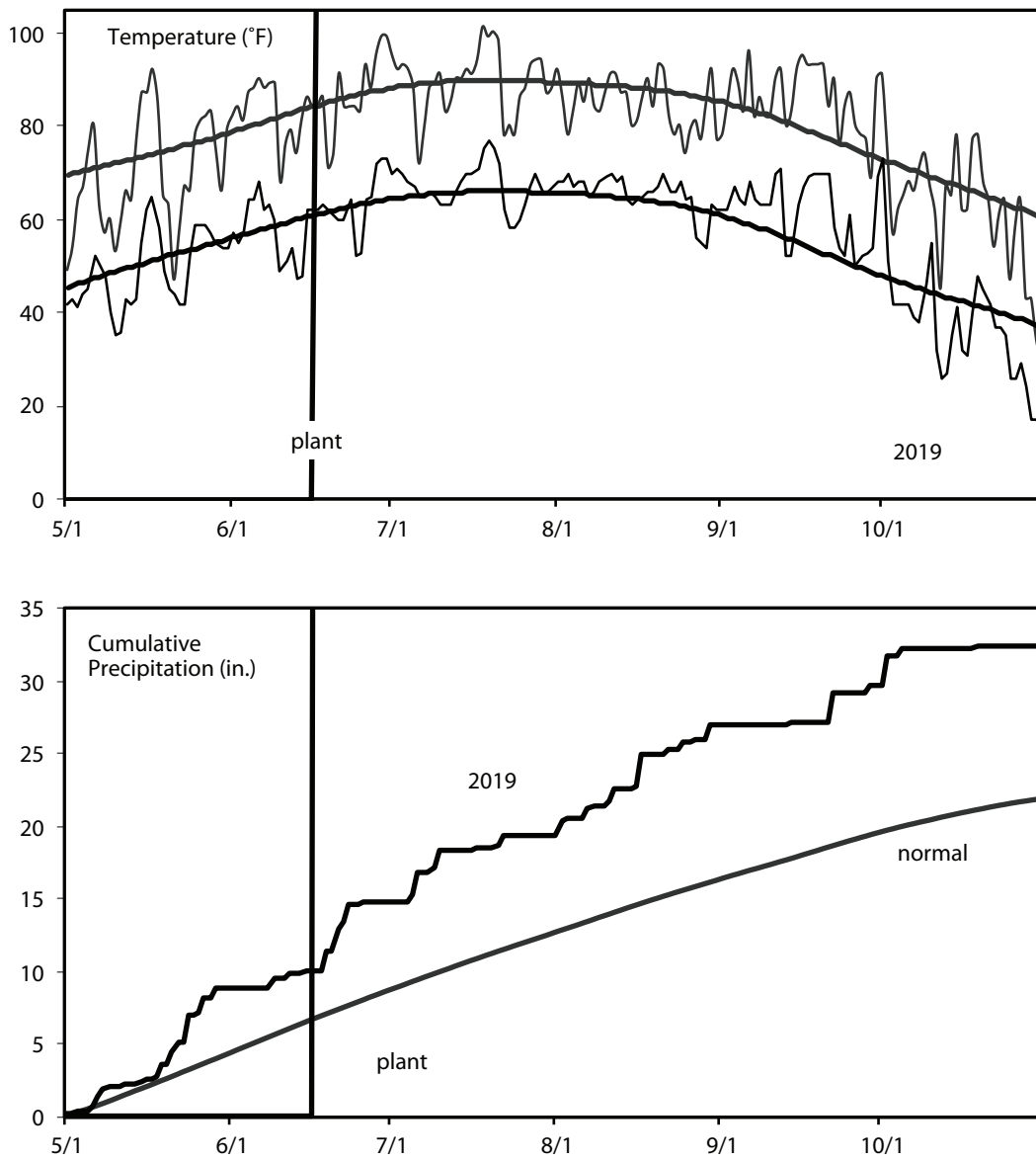


Figure 3. Precipitation and temperature during the 2019 growing season near Scandia, KS. Top pane: daily and mean (1981 to 2019) high and low temperature. Bottom pane: daily and mean (1981 to 2019) cumulative precipitation.

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