

2010

Kansas Performance Tests with

Alfalfa Varieties

Report of Progress 1043



**Kansas State University
Agricultural Experiment Station
and Cooperative Extension Service**

CN	RA	DC	NT	PL	SM	JW	RP	WS	MS	NM	BR	DO		
SH	TH	SD	GH	RO	OB	MC	CD	CY	RL	PT	JA	AT		
WA	LG	GO	TR	EL	RS	LC	OT	DK	GE	WB	SN	JF	LV	WY
GL	WH	SC	LE	NS	RH	BT	EW	SA	MR	LY	OS	DG	JO	
HM	KE	FI	HG	PN	SF	RC	MP	MN	CS	CF	AN	FR	MI	
ST	GT	HS	FO	ED	PR	RN	HV	BU	SG	GW	WO	AL	BB	
MT	SV	SW	ME	CA	KW	PR	KM	SG	BU	EK	WL	NO	CR	
					CM	BA	HP	SU	CL	CQ	MG	LB	CK	

★ performance tests

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Entrants in 2010 Kansas Alfalfa Performance Tests

Allied Seed, LLC (Allied, Farm Science Genetics) Nampa, ID 208-466-6700 alliedseed.com	Dairyland Seed Co. West Bend, WI 800-236-0163 dairylandseed.com	KSU AES Foundation Seed Manhattan, KS 785-532-6115 agronomy.ksu.edu	NE AES & USDA Foundation Seed Division Lincoln, NE 877-229-1363	WI AES Madison, WI 608-262-6203 uwex.edu/ces/forage
America's Alfalfa Nampa, ID 800-873-2532 Americasalfalfa.com	Forage Genetics Boone, IA 515-432-9115 Foragegenetics.com	Monsanto Seed (Dekalb) St. Louis, MO 800-335-2676	PGI Alfalfa, Inc. Woodland, CA 866-744-5710	W-L Research, Inc. Madison, WI 608-295-3566 wlresearch.com
Crop Production Srv. Fresno, CA 559-436-2941	Garst Seed Co. Greensburg, KS 620-546-5955 garstseed.com	Mycogen Seeds Indianapolis, IN 317-337-7568 Dow.com	Pioneer Hi-Bred Intl., Inc. Johnston, IA 800-247-6803 pioneer.com	
Croplan Genetics St. Paul, MN 800-851-8810 croplangenetics.com	Great Plains Research Co. (Cimarron USA) Cary, NC 800-874-7945 CimarronUSA.com	NC+ Hybrids Lincoln, NE 800-365-9804 nc-plus.com	Syngenta Seeds, Inc. (Golden Harvest, NK) Minneapolis, MN 800-445-0956 syngentaseeds.com	

Contribution No. 11-377-S from the Kansas Agricultural Experiment Station.

2010 PERFORMANCE TESTS

Objectives and Procedures

The Kansas Agricultural Experiment Station established an official alfalfa testing program in 1980 to provide Kansas growers with unbiased performance comparisons of alfalfa varieties marketed in the state. Every three years, private companies are asked to enter varieties voluntarily at the locations slated for establishment that year. Announcements and entry forms are mailed to private companies in June for entry in fall-seeded tests. Companies enter varieties of their choice and pay entry fees to cover part of the costs of conducting the tests. Most tests are planted in mid-August or September, but the southeast Kansas test usually is planted in the spring. Individual tests are conducted for a minimum of three years. New tests typically are established during the final production year of the previous test, or more frequently if there is enough interest.

Descriptive information is presented with the results for each test. This information, including soil type, establishment methods, fertilization, pest control, irrigation, harvest dates, and growing conditions unique to that location, can help explain test and/or variety performance.

Forage yields were estimated by harvesting four replications of each variety with a plot harvester. The amount of forage produced from a specific area (35 to 80 ft²) was weighed, and a subsample was taken to determine moisture content. This information was used to convert the plot weights to tons of dry matter per acre for each cutting, the season total, and the total for each previous season, as presented in Tables 1, 2, and 3. The forage yield over the lifetime of a particular test is presented as the total tons of dry matter produced per acre, as the total tons of 15% moisture hay, and as a percentage of the test average.

Each table is separated into three sections. The first lists released cultivars that are generally available on the seed market or soon will be. The second section includes experimental cultivars that were entered in the test before being released for sale. These experimental lines often represent an earlier generation of seed than that used for the released cultivars. The third section includes summary statistics unique to that test.

At the bottom of each column, the least significant difference (LSD) is listed at the 0.05 and 0.20 levels. These values indicate how large a difference is needed to be confident that one variety is superior to another. Differences between varieties that are equal to or greater than the 0.05 LSD have only a 1 in 20 chance of being due to chance or error. Differences equal to or greater than the 0.20 LSD have a 1 in 5 chance of being caused by chance or error.

The coefficient of variability (CV) provides an estimate of the consistency of the results of a particular test. In these tests, CV less than 10% generally indicate reliable, uniform data, whereas CV of 10 to 15% are not uncommon and generally indicate the data are acceptable for rough comparisons. Tests with CV greater than 15% still may be useful, but variety comparisons lack precision.

The mean coefficient of variability (MCV) is similar to the CV in that it serves as an indicator of test precision. The MCV is calculated by dividing the 0.05 LSD by the test mean (average) and multiplying by 100. The MCV reveals the percentage difference required to detect differences between varieties with 95% confidence.

Variety Characterization

For variety selection, producers should consider the performance of a variety in each of the current tests in which it appears, its performance over time and locations relative to familiar or check varieties, and the disease and insect resistance characteristics that are potentially important in specific situations.

Tables 1 through 3 contain updated yield data from individual tests currently in progress. First-season yields for a spring-planted test often are more variable than yields in subsequent years. Season totals are important, but yield distribution during the season might differ among varieties. Examine yields from individual cuttings to determine if differences in yield distribution exist. Yield totals over many years provide the best measure of variety performance over time.

Table 4 provides winter survival, disease and insect-resistance, multifoliolate expression, and continuous grazing tolerance ratings for released varieties. These ratings were obtained primarily from the annual "Winter Survival, Fall Dormancy & Pest Resistance Ratings for Alfalfa Varieties" pamphlet published by the National Alfalfa Alliance. That report summarizes information submitted by developers of alfalfa varieties as part of the variety registration process. The Association of Official Seed Certifying Agencies National Alfalfa Variety Review Board reviewed the ratings before they were published. Companies submitting varieties for the tests provided ratings for some unregistered varieties. Experimental varieties are also listed in Table 4 for brand identification.

Table 1. Southwest Kansas, Garden City Alfalfa Performance Test, Seeded August 30, 2006

Monty Spangler, agronomist

Southwest Research-Extension Center, Garden City, Keith silt loam

30 lb seed/acre

Plots 3'x20'; 3'x20' harvested

22-100-0 lb/a of N-P-K before planting

No disease or insect problems noted. Good growing season.

NAME	Forage yield										Total, 15% moist.	Total, % of mean
	tons/acre											
	dry matter											
	2010					2010	2009	2008	2007	Total		
5-27	6-29	7-30	9-3	10-7								
RELEASED CULTIVARS												
GH 727	3.73	3.31	2.31	2.03	1.73	13.11	12.23	12.61	37.95	44.64	106	
4A421	3.41	3.25	2.12	1.77	1.42	11.98	12.40	12.48	36.86	43.37	103	
Reward II	3.77	3.14	2.03	1.73	1.38	12.04	12.18	12.48	36.69	43.17	103	
6530	3.50	3.01	2.08	1.83	1.41	11.83	12.22	12.59	36.63	43.10	102	
WL 357 HQ	3.14	3.30	2.13	1.83	1.46	11.87	12.15	12.54	36.55	43.00	102	
Mountaineer 2.0	3.51	2.84	2.00	1.75	1.42	11.52	12.73	12.27	36.52	42.96	102	
Pioneer 54Q25	3.67	2.95	2.10	1.83	1.40	11.95	11.68	12.47	36.09	42.46	101	
Hybri+421	3.64	2.88	1.99	1.85	1.42	11.78	11.98	12.33	36.09	42.46	101	
FSG505 Bt	3.32	2.95	1.98	1.69	1.44	11.39	11.98	12.66	36.02	42.38	101	
6415	3.36	3.10	2.23	1.91	1.46	12.06	10.98	12.96	36.00	42.35	101	
Cimarron VL400	3.46	2.62	1.83	1.67	1.23	10.81	13.00	12.03	35.84	42.17	100	
Kanza	3.74	2.91	2.09	1.91	1.37	12.03	12.18	11.57	35.77	42.08	100	
Rebound 5.0	3.48	2.85	2.01	1.73	1.36	11.43	11.50	12.82	35.74	42.05	100	
FSG408DP Bt	3.41	2.97	2.01	1.88	1.35	11.62	11.85	12.14	35.61	41.89	100	
Marvel	3.50	2.97	2.09	1.72	1.51	11.79	10.75	12.99	35.52	41.79	99	
Expedition	3.42	3.15	2.14	1.77	1.47	11.95	10.83	12.59	35.37	41.61	99	
Mariner III	3.25	2.96	1.96	1.75	1.36	11.28	11.45	12.59	35.32	41.55	99	
6420	3.72	2.81	1.98	1.77	1.42	11.71	11.05	12.48	35.24	41.46	99	
WL 355 RR	3.28	2.81	2.14	1.73	1.37	11.32	11.30	12.59	35.22	41.43	99	
Perry	3.49	2.57	1.86	1.77	1.22	10.91	12.68	11.63	35.21	41.43	99	
Pioneer 54V46	3.32	3.02	1.99	1.77	1.33	11.44	11.33	12.42	35.18	41.39	98	
4G418RR	3.34	2.96	2.12	1.81	1.46	11.69	11.10	12.27	35.06	41.24	98	
Pioneer 54V09	3.26	2.88	1.97	1.65	1.33	11.09	11.18	12.73	35.00	41.17	98	
Genoa	3.52	2.91	2.08	1.75	1.42	11.69	10.65	12.61	34.95	41.12	98	
FSG406	3.26	3.20	1.99	1.79	1.41	11.66	10.68	12.57	34.90	41.06	98	
DKA41-18RR	3.15	3.20	2.06	1.78	1.43	11.63	10.75	12.30	34.67	40.79	97	
Escalade	3.34	2.97	2.00	1.72	1.32	11.35	10.93	11.92	34.19	40.23	96	
Artesian Sunrise	3.16	2.85	1.99	1.82	1.41	11.23	10.65	12.08	33.96	39.95	95	
Phoenix	3.38	2.88	1.97	1.86	1.37	11.45	10.68	11.77	33.90	39.88	95	
WL 343 HQ	3.27	3.11	2.15	1.88	1.71	12.12	10.05	11.68	33.85	39.83	95	
MP04	3.62	2.57	1.73	1.62	1.24	10.79	11.13	11.39	33.31	39.18	93	
EXPERIMENTAL STRAINS												
4S419	3.79	3.00	2.22	1.80	1.44	12.26	13.83	13.30	39.39	46.34	110	
msSunstra-614	3.38	3.09	2.31	2.05	1.53	12.35	13.45	12.32	38.12	44.84	107	
I Chg 04	3.61	2.97	2.05	1.74	1.33	11.70	13.75	11.95	37.40	44.00	105	
FG 52M146	3.25	3.15	2.22	1.80	1.52	11.94	12.18	12.72	36.84	43.34	103	
msSunstra-613	3.18	3.11	2.32	1.94	1.49	12.04	11.43	12.28	35.74	42.05	100	
DS253	3.41	3.01	2.21	2.12	1.61	12.35	11.30	11.43	35.08	41.27	98	
DS961	3.10	2.83	2.20	1.99	1.48	11.60	11.35	11.48	34.43	40.51	96	
SUMMARY STATISTICS												
Average	3.43	2.98	2.07	1.81	1.42	11.70	11.72	12.32	35.74	35.74	100	
LSD (0.05)	0.57	0.40	0.19	0.21	0.18	1.04	1.78	0.61	1.89	2.22	8	
LSD (0.20)	0.37	0.26	0.12	0.14	0.12	0.67	1.16	0.40	1.23	1.44	5	
CV (%)	11.92	9.61	6.46	8.31	9.06	6.31	10.86	3.55	5.60	5.60	6	
MCV (%)	16.71	13.47	9.05	11.64	12.70	8.85	15.22	4.98	7.85	7.85	8	

Table 2. Northwest Kansas, Colby Alfalfa Performance Test, Seeded September 2, 2009

Pat Evans, agronomist

Northwest Research-Extension Center, Colby, Keith silt loam

18 lb seed/acre

Plots 3'x20'; 3'x17' harvested

14-46-0 lb/a of N-P-K before planting

Growing conditions were normal with no insect problems.

NAME	Forage yield						Total, 15% moist.	Total, % of mean
	tons/acre							
	dry matter							
	2010				2010	Total		
6-4	7-14	8-10	9-13					
RELEASED CULTIVARS								
WL 363HQ	2.55	2.20	1.74	1.50	7.98	7.98	9.39	114
Archer III	2.55	2.17	1.66	1.29	7.66	7.66	9.01	109
AmeriStand 403T+	2.60	2.20	1.68	1.16	7.64	7.64	8.99	109
LegenDairy 5.0	2.53	2.00	1.79	0.94	7.26	7.26	8.54	103
Mountaineer 2.0	2.45	1.60	1.64	1.53	7.22	7.22	8.50	103
6422Q	2.30	1.92	1.74	1.20	7.16	7.16	8.42	102
Perry	2.45	1.96	1.61	0.79	6.82	6.82	8.03	97
AmeriStand 407TQ	2.51	1.84	1.35	1.10	6.80	6.80	8.00	97
Kanza	1.59	1.77	1.49	1.13	5.98	5.98	7.03	85
Vernal	1.88	1.77	1.39	0.82	5.86	5.86	6.89	83
SUMMARY STATISTICS								
Average	2.34	1.94	1.61	1.15	7.03	7.03	8.28	100
LSD (0.05)	0.56	0.61	0.57	0.63	1.11	1.11	1.31	16
LSD (0.20)	0.36	0.39	0.36	0.41	0.71	0.71	0.84	10
CV (%)	16.40	21.53	24.39	38.09	10.90	10.90	10.90	11
MCV (%)	23.79	31.23	35.38	55.26	15.81	15.81	15.81	16

Table 3. Southeast Kansas, Colby Alfalfa Performance Test, Seeded April 12, 2010

Joseph Moyer, agronomist

Southeast Research-Extension Center, Mound Valley

Parsons silt loam, 18 lb seed/acre

Plots 3'x20'; 3'x17' harvested

20-50-200 lb/a of N-P-K before planting

Some leaf loss before third cut because wet ground prevented earlier cutting.

NAME	Forage yield						Total, 15% moist.	Total, % of mean
	tons/acre							
	dry matter							
	2010			2010	Total	Total		
7-1	8-3	12-1						
RELEASED CULTIVARS								
FSG639ST Bt	1.64	1.44	1.17	4.25	4.25	5.00	110	
FSG408DP Bt	1.74	1.40	1.05	4.18	4.18	4.92	109	
Kanza	1.74	1.22	1.22	4.18	4.18	4.92	109	
Perry	1.89	1.08	1.12	4.08	4.08	4.80	106	
AmeriStand 407TQ	1.71	1.27	1.06	4.04	4.04	4.75	105	
WL 363HQ	1.62	1.31	1.03	3.97	3.97	4.66	103	
Vernal	1.62	1.08	1.17	3.87	3.87	4.55	101	
AmeriStand 403T+	1.67	1.36	0.83	3.86	3.86	4.54	100	
FSG505 Bt	1.56	1.29	1.00	3.84	3.84	4.52	100	
DG 4210	1.46	1.28	1.07	3.80	3.80	4.47	99	
6422Q	1.58	1.30	0.88	3.76	3.76	4.42	98	
Archer III	1.49	1.24	0.99	3.72	3.72	4.38	97	
FSG 528SF	1.54	1.22	0.90	3.65	3.65	4.29	95	
6552	1.53	1.25	0.84	3.63	3.63	4.26	94	
WL 343 HQ	1.44	1.24	0.68	3.36	3.36	3.95	87	
DKA50-18	1.48	1.19	0.68	3.35	3.35	3.94	87	
SUMMARY STATISTICS								
Average	1.61	1.26	0.98	3.84	3.84	4.52	100	
LSD (0.05)	0.19	0.15	0.32	0.40	0.40	0.47	10	
LSD (0.20)	0.12	0.10	0.20	0.26	0.26	0.30	7	
CV (%)	8.37	8.22	22.59	7.25	7.25	7.25	7	
MCV (%)	11.92	11.70	32.17	10.33	10.33	10.33	10	

Table 4. 2010 Performance test entries, with disease and insect resistance ratings for released varieties*

A A S N													A A S N																					
P S B P P R R M													P S B P P R R M																					
Brand	W	B	V	F	A	R	A	P	A	S	H	K	K	P	L	G	Brand	W	B	V	F	A	R	A	P	A	S	H	K	K	P	L	G	
name	S	W	W	W	N	R	A	A	A	N	1	2	N	N	L	E	name	S	W	W	W	N	R	A	A	A	N	1	2	N	N	L	E	T
Allied																Golden Harvest																		
Escalade	-	H	R	R	R	H	M	R	-	-	R	-	-	-	-	-	GH 727	1	H	H	H	H	H	-	R	-	R	H	-	-	-	-	H	
FSG406	1	H	H	H	H	H	-	R	-	R	H	-	-	R	-	H	KS AES & USDA																	
FSG408DP Bt	2	H	R	H	H	H	-	R	-	R	R	-	-	H	-	-	Kanza	-	R	-	-	-	-	R	R	-	-	-	-	-	-	-	-	
FSG505 Bt	2	H	H	H	H	H	R	R	-	R	H	-	-	R	-	-	Monsanto																	
FSG639ST Bt	3	H	R	R	R	H	-	R	-	H	M	-	R	H	-	-	DKA41-18RR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Mariner III	2	H	H	H	H	H	-	R	-	R	H	R	-	H	-	-	DKA50-18	2	H	H	H	H	H	R	R	-	R	H	-	-	-	-	H	
Marvel	2	H	H	H	H	H	R	R	-	-	H	-	-	-	-	H	Mycogen																	
Phoenix	4	H	H	H	H	H	-	H	-	H	R	-	-	MR	-	-	4A421	-	H	H	H	H	H	H	-	-	H	-	-	M	-	-	-	
America's Alfalfa																4G418RR																		
AmeriStand 403T+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4S419																	
AmeriStand 407TQ	2	H	H	H	H	H	R	H	-	M	H	R	-	-	-	-	NC+																	
Archer III	2	H	H	H	H	H	-	H	-	H	H	-	-	H	-	H	Hybri+421	2	H	R	H	H	H	R	R	-	R	R	-	-	H	-	-	-
Cimarron USA																NE AES & USDA																		
Cimarron VL400	-	R	R	H	H	H	H	R	R	R	-	S	-	-	-	-	Perry	-	R	-	-	L	-	M	R	-	-	-	-	-	M	-	-	
I Chg 04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NK																	
MP04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Expedition	3	R	H	H	H	H	R	-	-	R	H	-	-	R	-	-	-
CPS																PGI																		
DG 4210	1	H	H	H	H	H	-	R	-	R	H	-	-	-	-	-	Reward II	2	H	R	H	R	H	R	R	R	R	R	R	-	-	H	-	-
Croplan Genetics																Pioneer																		
Artesian	-	M	R	R	H	H	H	H	R	R	-	-	-	R	-	H	54Q25	-	H	H	H	H	H	R	R	-	H	R	-	-	H	-	-	-
Sunrise	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	54V09	-	H	H	R	H	H	R	H	-	H	R	MR	-	H	-	-	-
LegenDairy 5.0	2	H	H	H	H	H	R	R	-	M	H	-	-	R	-	H	54V46	-	R	H	H	H	H	R	R	L	M	H	R	-	H	-	-	-
Mountaineer 2.0	2	H	R	H	H	H	R	H	-	H	R	-	-	R	-	H	Syngenta																	
Rebound 5.0	2	H	H	H	H	H	-	R	-	-	H	-	-	-	-	H	6305Q	1	H	H	H	H	H	H	-	-	R	H	-	-	-	-	H	-
Dairyland Seed																6422Q																		
DS253	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	WI AES																	
DS961	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Vernal	-	R	-	MR	-	-	-	-	-	-	-	-	-	-	MR	-	-
msSunstra-613	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	W-L Research																	
msSunstra-614	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	WL 343 HQ	1	H	H	H	H	H	-	H	-	R	H	-	-	-	-	H	-
Farm Science Genetics																WL 355 RR																		
FSG 528SF	-	H	H	H	H	R	-	R	R	-	R	-	-	-	-	L	WL 357 HQ	2	H	H	H	H	H	-	H	-	-	H	-	-	-	-	-	-
Forage Genetics																WL 363HQ																		
FG 52M146	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Garst																	
Garst																6400HT																		
6400HT	2	H	H	H	H	H	-	H	-	-	H	-	-	-	-	Y	6415	1	H	H	H	H	H	R	R	-	-	H	-	-	-	-	H	-
6415	1	H	H	H	H	H	R	R	-	-	H	-	-	-	-	H	6420	2	H	R	H	R	H	R	R	-	R	R	-	-	H	-	-	-
6420	2	H	R	H	R	H	R	R	-	R	R	-	-	H	-	-	6431	2	H	H	H	H	H	-	R	-	H	H	-	H	-	-	-	-
6431	2	H	H	H	H	H	-	R	-	H	H	-	-	H	-	-	6530	-	H	H	H	H	H	-	H	-	R	H	M	-	-	-	-	
6530	-	H	H	H	H	H	-	H	-	R	H	M	-	-	-	-	6552	2	H	H	H	H	H	-	R	-	R	H	-	-	-	-	H	-
6552	2	H	H	H	H	H	-	R	-	R	H	-	-	-	-	H																		

*WS = Winter survival, 1 = superior
 BW = Bacterial wilt
 VW = Verticillium wilt
 FW = Fusarium wilt
 AN = Anthracnose race 1
 PRR = Phytophthora root rot
 SAA = Spotted alfalfa aphid
 PA = Pea aphid
 BAA = Blue alfalfa aphid
 SN = Stem nematode
 APH1 = Aphanomyces root rot race 1
 APH2 = Aphanomyces root rot race 2
 SRKN = Southern root knot nematode
 NRKN = Northern root knot nematode
 PL = Potato leafhopper
 MLE = Multifoliolate expression
 GT = Continuous grazing tolerance, Y/N

Pest resistance ratings:

Code	Resistance class	% resistant plants
S	Susceptible	0-5%
L	Low Resistance	6-14%
M	Moderate Resistance	15-30%
R	Resistance	31-50%
H	High Resistance	>50%
-	Not adequately tested	

Disease and insect resistance ratings are from the National Alfalfa Alliance, NAAIC descriptions, or from developers of the varieties.

To access crop performance testing information electronically, visit our Web site. The information contained in this publication, plus more, is available for viewing or downloading at:

www.agronomy.ksu.edu/kscpt

Excerpts from the
University Research Policy Agreement with Cooperating Seed Companies

Permission is hereby given to Kansas State University (KSU) to test varieties and/or hybrids designated on the attached entry forms in the manner indicated in the test announcements. I certify that seed submitted for testing is a true sample of the seed being offered for sale.

I understand that all results from Kansas Crop Performance Tests belong to the University and the public and shall be controlled by the University so as to produce the greatest benefit to the public. Performance data may be used in the following ways: 1) Tables may be reproduced in their entirety provided the source is referenced and data are not manipulated or reinterpreted; 2) Advertising statements by an individual company about the performance of its entries may be made as long as they are accurate statements about the data as published, with no reference to other companies' names or cultivars. In both cases, the following must be included with the reprint or ad citing the appropriate publication number and title: "See the official Kansas State University Agricultural Experiment Station and Cooperative Extension Service Report of Progress 1043, '2010 Kansas Performance Tests with Alfalfa Varieties,' or the Kansas Crop Performance Test Web site, www.agronomy.ksu.edu/kscpt, for details. Endorsement or recommendation by Kansas State University is not implied."

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