

# 2000

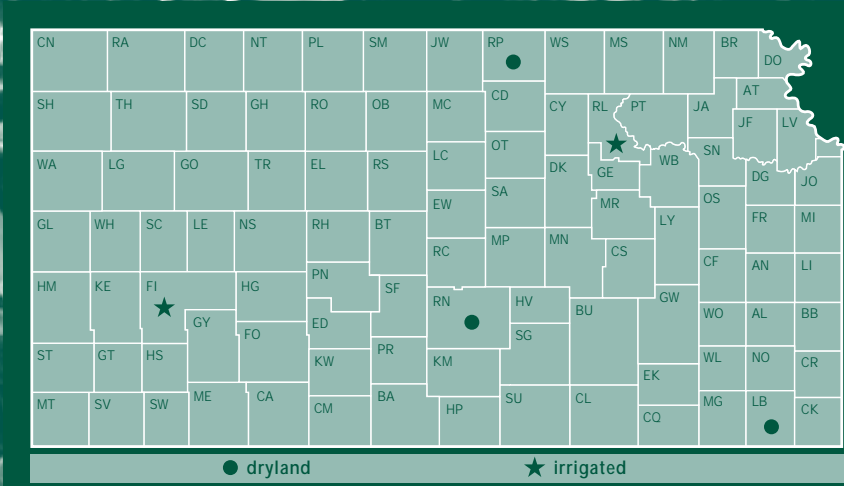
KANSAS PERFORMANCE TESTS WITH

# ALFALFA VARIETIES

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REPORT OF PROGRESS 870

Kansas State University  
Agricultural Experiment Station  
and Cooperative Extension Service



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# 2000 KANSAS ALFALFA PERFORMANCE TESTS

## INTRODUCTION

### TEST OBJECTIVES AND PROCEDURES

The Kansas Agricultural Experiment Station established an official alfalfa performance testing program in 1980 to provide Kansas growers with unbiased performance comparisons on alfalfa varieties marketed in the state. Each year, 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; however, the Southeast Kansas test usually is planted in the spring. Individual tests are conducted for a minimum of 3 years. New tests are established during the final production year of the previous test.

The Manhattan test was established as a "no insecticide" test to evaluate variety differences in resistance and/or tolerance to infestations of insect pests such as alfalfa weevil and potato leafhopper. The susceptible check variety, Ranger, was included as a basis for comparison. Other tests are treated with insecticide to control weevils, armyworms, or other pests that might decimate the crop, but rarely for leafhoppers.

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 (35-80 ft<sup>2</sup>) 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 1-6.

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's below 10% generally indicate reliable, uniform data, whereas CV's of 10-15% are not uncommon and generally indicate that the data are acceptable for rough comparisons. Tests with CV's over 15% may still 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 percent difference required to detect differences between varieties with 95% confidence. Many alfalfa breeders and testers agree that tests with MCV values greater than 10% are of little benefit.

## 2000 STATEWIDE GROWING CONDITIONS

Warm temperatures accelerated alfalfa development for much of the growing season (Figure 1), but soil moisture deficits delayed and reduced late-season harvests (Figure 2). All four harvests started earlier than the average (Figure 3). The first three harvests were completed ahead of last year's and the 5-year average. The fourth harvest was slowed considerably in mid-August by extremely hot, dry weather that delayed regrowth after the third harvest in many areas. Some areas had essentially no regrowth. (From Crop-Weather reports, Kansas Agricultural Statistics, Topeka).

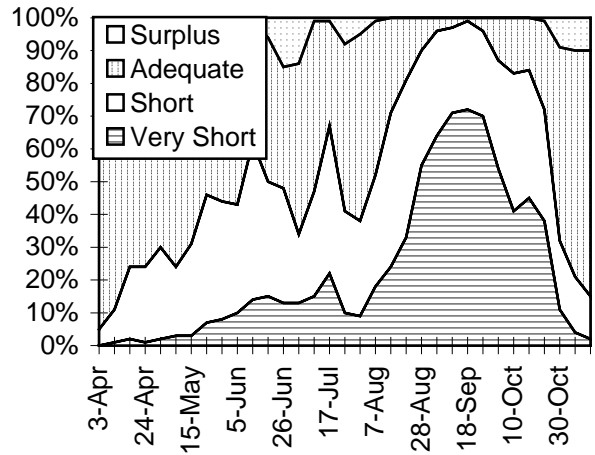


Figure 2. Status of statewide topsoil moisture.

The hot, dry conditions in August and September reduced statewide average yields and total alfalfa hay production compared to last year. The November 9 Kansas Agricultural Statistics report predicted a 0.7 ton per acre decrease in average yield from 4.4 tons per acre in 1999 to 3.7 tons per acre in 2000. Total alfalfa acreage in 2000 was unchanged from that in 1999 at 850,000 acres. The lower yield per acre resulted in a decrease in total alfalfa hay production from 3.7 million tons in 1999 to 3.1 million tons in 2000.

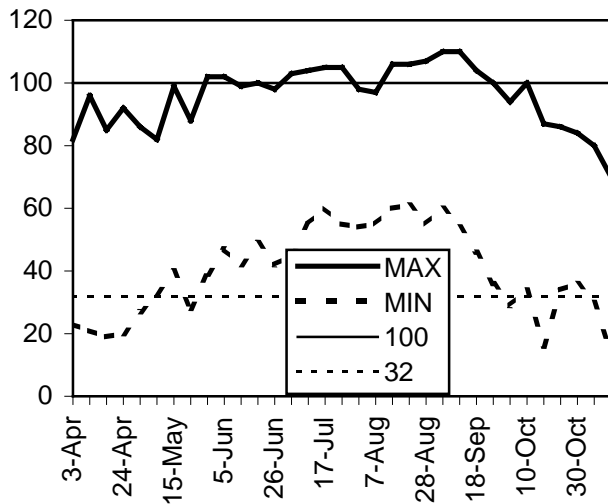


Figure 1. 2000 Kansas weekly maximum and minimum temperatures.

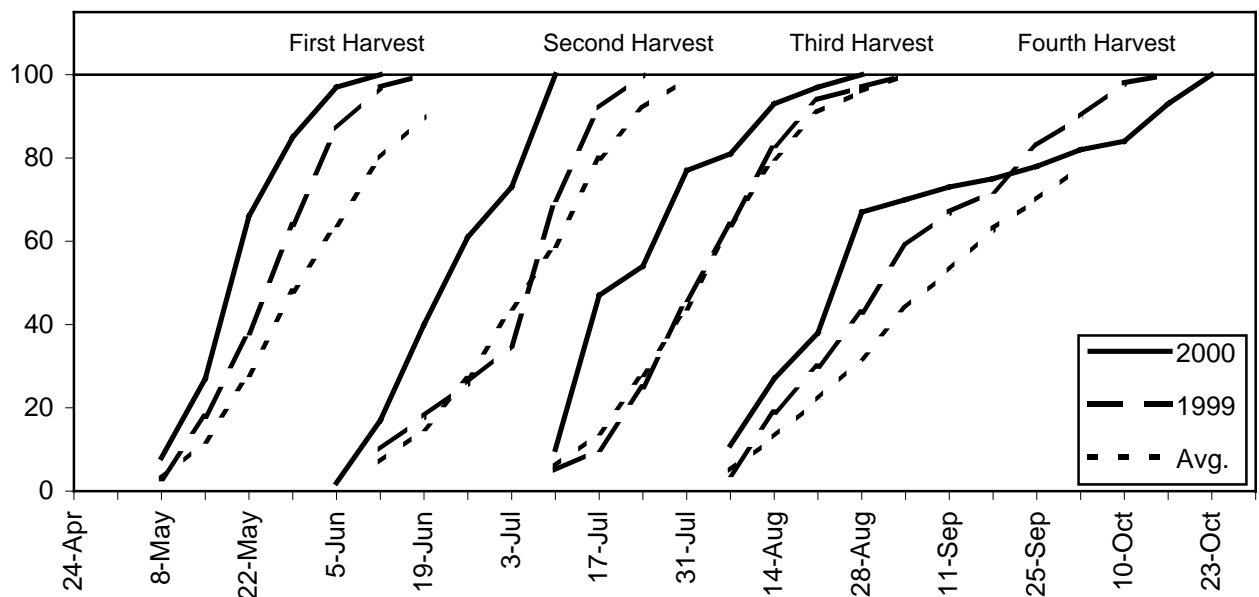


Figure 3. Progress of statewide alfalfa harvest.

Alfalfa weevil remained the insect of most concern to alfalfa growers in 2000. Infestations were first noted in several counties in south central Kansas in early March. Weevils continued to damage alfalfa fields in central and southwest Kansas during late March and April. Army cutworm populations required treatment of some fields in south central and southwest Kansas in early spring. Aphid populations also began to increase in March and April. Pea aphids had reached high levels in some fields by early May, but beneficial parasites appeared to keep them from causing serious damage. In early September, adults of several potential pests of newly seeded alfalfa appeared in insect traps: beet armyworm, fall armyworm, garden webworm, corn earworm, yellow striped armyworm, and alfalfa butterfly. Pest populations varied greatly from field to field. (From Cooperative Economic Insect Survey reports, Kansas Department of Agriculture and Kansas Insect Newsletter, KSU Extension Entomology).

Alfalfa stem nematode (*Ditylenchus dipsaci*) appeared to be more widespread in 2000 than in the past. Tim Todd, KSU plant nematologist, confirmed the alfalfa stem nematode in several south central and southeast counties in March and April. The typical spring diseases, leptosphaerulina leaf spot, spring black stem, and phytophthora root rot, appeared in samples sent to the Plant Disease Diagnostic Clinic in May. Samples sent later in the season showed symptoms of alfalfa mosaic virus, leaf rust, and summer black stem. (From Plant Disease Alerts, KSU Department of Plant Pathology).

## VARIETY CHARACTERIZATION

For variety selection, producers should consider the performance of a variety in each of the current tests where 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 their situation.

Tables 1-6 contain updated yield data from individual tests currently in progress. First-season yields for a spring-planted test are often more variable than yields in subsequent years. Season totals are important, but yield distribution during the season may vary between 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.

The appendices provide additional descriptive and contact information. Appendix 1 contains fall dormancy, disease resistance, and insect resistance ratings. These ratings were obtained primarily from the annual 'Fall Dormancy & Pest Resistance Ratings for Alfalfa Varieties' pamphlet published by the Alfalfa Council. That report summarizes information submitted by developers of alfalfa varieties as part of the variety registration process. The Association of Official Seed Certifying Agencies (AOSCA) National Alfalfa Variety Review Board (NAVRB) reviewed the ratings before they were published. Companies submitting varieties for the tests provided ratings for some unregistered varieties. Appendix 2 contains marketing contacts for all released varieties included in the 2000 Kansas Alfalfa Performance Tests.

Fall dormancy values are based on the fall canopy height measured in Minnesota. Dormancy values generally are related to the speed of regrowth. The rapid regrowth types have higher values, and the slower regrowth types have lower values.

**Table 1. Northeast Kansas, Powhattan Alfalfa Performance Test, Seeded August 1998.**

NAME	Forage Yield, 2000				Total 15% Moist.	Total, % of Mean
	tons/acre					
	Dry Matter			Total		
5-13	6-23	8-1	Total			
<b>RELEASED CULTIVARS</b>						
Dagger+EV	1.81	1.11	1.13	4.05	4.76	105
DK 141	1.81	1.13	1.10	4.04	4.75	105
Geneva	1.73	1.22	1.08	4.03	4.74	104
Pioneer 54H55	1.69	1.11	1.22	4.01	4.72	104
WL 232 HQ	1.67	1.10	1.21	3.98	4.68	103
Spur	1.72	1.09	1.17	3.97	4.67	103
Gold Plus	1.78	1.07	1.11	3.96	4.66	103
WL 325 HQ	1.71	1.09	1.15	3.94	4.64	102
Ace	1.78	1.07	1.05	3.91	4.60	101
Depend+EV	1.59	1.12	1.16	3.87	4.55	100
ProGro	1.61	1.12	1.13	3.86	4.54	100
WL 324	1.60	1.10	1.16	3.86	4.54	100
DK 142	1.67	1.09	1.09	3.85	4.53	100
Pioneer 53V08	1.77	1.00	1.08	3.84	4.52	99
Yielder	1.71	1.00	1.08	3.78	4.45	98
Emperor	1.75	1.01	1.02	3.78	4.45	98
Cimarron 3i	1.62	1.08	1.06	3.76	4.42	97
TMF 4464	1.75	1.02	0.97	3.75	4.41	97
Magnum V	1.67	1.04	1.04	3.74	4.40	97
Kanza	1.52	1.06	1.14	3.72	4.38	96
Amerigraze 401+Z	1.65	1.06	0.99	3.69	4.34	96
ABT350	1.53	1.11	1.04	3.67	4.32	95
Affinity+Z	1.61	0.99	1.03	3.62	4.26	94
Perry	1.50	1.05	0.99	3.55	4.18	92
<b>EXPERIMENTAL STRAINS</b>						
4G70	1.81	1.19	1.11	4.11	4.84	106
C304	1.75	1.09	1.26	4.10	4.82	106
ZC9751A	1.73	1.18	1.19	4.09	4.81	106
C230	1.69	1.08	1.11	3.88	4.56	101
ZC9741A	1.61	1.07	1.12	3.79	4.46	98
ZC9740A	1.68	1.04	1.03	3.76	4.42	97
ZH9731H	1.62	1.05	1.00	3.67	4.32	95
<b>SUMMARY STATISTICS</b>						
Average	1.68	1.08	1.10	3.86	4.54	100
LSD(0.05)	0.15	0.09	NS	0.23	0.27	6
LSD(0.20)	0.08	0.04	0.08	0.12	0.14	3
CV(%)	7.73	6.94	11.07	5.14	5.14	5
MCV(%)	8.93	8.33	NS	5.96	5.96	6

<p><b>LOCATION:</b> Northeast Kansas  Site: Cornbelt Experiment Field  County: Brown  Town: Powhattan  Soil: Grundy silty clay loam</p> <p><b>ESTABLISHMENT:</b>  9/2/98; RCBD, 4 reps  Plots 5'x20'; 4'x20' harvested  15 lb. seed/acre</p>	<p><b>2000 FERTILIZATION:</b>  16.5-72-90 in December</p> <p><b>2000 PEST CONTROL:</b>  An early-season weevil infestation was controlled by the first harvest.</p>	<p><b>2000 CONDITIONS:</b>  The test was clipped in 1999, but no yields are reported because of excessive variability. Dry winter and spring weather didn't replenish soil moisture as much as desired. The dry conditions intensified in late summer and prevented a fourth harvest.</p>
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**Table 2. Northeast Kansas, Manhattan Alfalfa Performance Test, Seeded May 1999.  
Limited Irrigation**

NAME	Plant Height inches	Leaf Hopper Injury Rating 1-5*			Forage Yield								99-00 Total, % of Mean	
					tons/acre									Total, 15% Moist.
					Dry Matter				1999 Total	99-00 Total				
					2000									
9-8	8-1	9-8	Average	6-6	7-3	8-1	9-8	Total	Total	Total				
<b>RELEASED CULTIVARS</b>														
645-II	13	1.6	2.4	2.0	3.46	1.80	2.01	1.30	8.58	1.97	10.55	12.41	113	
NetYield500	12	2.4	4.3	3.4	3.48	2.05	1.85	1.21	8.59	1.91	10.50	12.35	112	
Kanza	17	2.5	2.7	2.6	2.62	1.83	1.80	1.51	7.76	2.23	9.99	11.75	107	
Abilene+Z	13	1.7	2.8	2.2	2.57	2.15	1.68	1.33	7.74	1.99	9.73	11.45	104	
Jade II	13	2.4	3.2	2.8	2.67	2.00	1.66	1.35	7.67	1.99	9.66	11.36	103	
Pioneer 54H69	17	1.6	2.4	2.0	2.87	1.75	1.40	1.55	7.56	1.97	9.53	11.21	102	
Feast+EV	14	2.0	3.3	2.6	2.91	1.89	1.45	1.16	7.41	2.11	9.52	11.20	102	
ABT 400SCL	15	1.7	2.4	2.1	2.77	1.87	1.48	1.40	7.53	1.95	9.48	11.15	101	
Dagger+EV	14	1.5	3.1	2.3	2.58	1.96	1.71	1.31	7.56	1.73	9.29	10.93	99	
Geneva	14	2.0	2.9	2.4	2.64	1.84	1.41	1.36	7.25	1.94	9.19	10.81	98	
Ameriguard 302+Z	16	1.9	2.2	2.0	2.68	1.73	1.51	1.40	7.32	1.80	9.12	10.73	97	
Defense+EV	15	1.8	2.1	1.9	2.42	1.71	1.55	1.32	7.00	1.99	8.99	10.58	96	
Perry	15	1.6	2.4	2.0	2.69	1.68	1.49	1.40	7.25	1.71	8.96	10.54	96	
DK 131HG	16	1.1	1.3	1.2	2.21	1.64	1.50	1.40	6.75	1.93	8.68	10.21	93	
Ranger	12	2.6	4.2	3.4	2.48	1.55	1.28	1.08	6.39	1.54	7.93	9.33	85	
<b>EXPERIMENTAL STRAINS</b>														
ZG9840	13	1.5	2.7	2.2	3.03	1.84	1.78	1.32	7.97	1.96	9.93	11.68	106	
ZC9842A	13	2.2	2.7	2.5	2.78	1.81	1.85	1.23	7.67	2.02	9.69	11.40	103	
ZC9851A	15	1.1	2.2	1.6	2.70	1.94	1.84	1.30	7.79	1.76	9.55	11.24	102	
W326	15	2.3	3.1	2.7	2.40	2.07	1.68	1.39	7.54	1.96	9.50	11.18	101	
ZC9840A	13	1.4	2.7	2.0	2.95	1.76	1.58	1.41	7.70	1.75	9.45	11.12	101	
ZC9650	16	1.4	2.4	1.9	2.62	1.83	1.55	1.46	7.47	1.96	9.43	11.09	101	
ZC9841A	12	1.5	2.4	2.0	2.42	2.08	1.57	1.29	7.36	1.90	9.26	10.89	99	
ZH9844H	14	1.1	1.1	1.0	2.41	1.58	1.57	1.41	6.97	2.17	9.14	10.75	98	
ZH9841H	14	0.9	1.4	1.1	2.67	1.57	1.31	1.15	6.70	1.83	8.53	10.04	91	
KS224	14	2.3	3.4	2.9	2.64	1.74	1.37	1.13	6.88	1.59	8.47	9.96	90	
<b>SUMMARY STATISTICS</b>														
Average	14	1.8	2.6	2.2	2.71	1.83	1.59	1.33	7.46	1.91	9.37	11.02	100	
LSD(0.05)	2	0.6	0.7	0.5	0.28	0.19	0.24	0.19	0.57	0.19	0.77	0.91	8	
LSD(0.20)	1	0.3	0.4	0.2	0.14	0.10	0.12	0.10	0.29	0.15	0.39	0.46	4	
CV(%)	11	27.9	23.5	17.9	8.67	9.03	12.76	12.35	6.43	8.60	5.44	5.44	5	
MCV(%)	13	32.9	27.7	21.0	10.21	10.63	15.09	14.52	7.58	10.11	8.22	8.22	8	

\*NAAIC Leaf Hopper Resistance Ratings:

- 1 - No apparent injury
- 2 - Very minor stunting and yellowing
- 3 - Moderate stunting, yellowing is evident on 20-40% of leaves
- 4 - Significant injury; plants show significant stunting with yellowing on 40-60% of leaves
- 5 - Severe injury; plants show severe stunting, yellowing or reddening evident on 60-100% of leaves

<p><b>LOCATION:</b> Northeast Kansas Site: Ashland Research Farm County: Riley Town: Manhattan Soil: Haynie very fine sand</p> <p><b>ESTABLISHMENT:</b> 5/24/99; RCBD, 4 reps Plots 3'x15'; 3'x12' harvested 15 lb. seed/acre</p>	<p><b>2000 FERTILIZATION:</b> None</p> <p><b>2000 PEST CONTROL:</b> Insect infestations were not controlled, so that inherent resistance to insects could be evaluated.</p>	<p><b>2000 CONDITIONS:</b> Weevils caused moderate damage to the first harvest. Leaf hoppers caused noticeable damage to the third and fourth harvests. Two irrigations of 2 inches each were applied after the each of the last three cuttings. The first harvest was taken at 20% bloom, and the other harvests at 10% bloom.</p>
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**Table 3. North Central Kansas, Belleville Alfalfa Performance Test, Seeded Sept. 1997.**

NAME	Forage Yield							98-00 Total, % of Mean
	tons/acre							
	Dry Matter						Total, 15% Moist.	
	2000		1999 Total	1998 Total	98-00 Total	Total, 15% Moist.		
6-1	7-2	Total						
<b>Released Cultivars</b>								
Dominator	2.01	0.96	2.97	8.41	6.44	17.82	20.96	110
DK 142	2.02	1.00	3.02	7.98	6.28	17.28	20.33	107
DK 127	1.78	0.81	2.59	8.08	6.29	16.96	19.95	105
WL 324	1.71	0.82	2.53	7.86	6.21	16.60	19.53	103
WL 325 HQ	1.89	0.80	2.69	7.79	6.01	16.49	19.40	102
Pioneer 5454	1.82	0.83	2.65	7.75	6.07	16.47	19.38	102
Spur	1.66	0.81	2.46	7.78	6.03	16.27	19.14	101
Asset	1.78	0.82	2.60	7.43	6.04	16.07	18.91	99
Perry	2.00	0.93	2.94	7.29	5.72	15.95	18.76	99
Depend+EV	1.65	0.74	2.39	7.33	6.06	15.78	18.56	98
Kanza	1.83	0.76	2.59	7.45	5.50	15.54	18.28	96
<b>Experimental Strains</b>								
ZN9541	1.80	0.78	2.57	7.35	5.65	15.57	18.32	96
ZN9540	1.86	0.82	2.68	7.20	5.64	15.52	18.26	96
ZN9646	1.65	0.73	2.38	7.33	5.74	15.45	18.18	96
ZC9641	2.36	1.04	3.40	6.20	5.09	14.69	17.28	91
<b>Summary Statistics</b>								
Average	1.85	0.84	2.70	7.55	5.92	16.17	19.02	100
LSD(0.05)	0.18	0.13	0.27	0.52	0.33	1.13	1.33	7
LSD(0.20)	0.09	0.06	0.14	0.40	0.26	0.57	0.67	4
CV(%)	8.20	12.63	8.53	5.77	4.71	3.50	3.50	4
MCV(%)	9.76	15.02	10.14	6.86	5.60	6.99	6.99	7

<p><b>LOCATION:</b> North Central Kansas                  Site: North Central Kansas Exp. Field                  County: Republic                  Town: Belleville                  Soil: Crete silt loam</p> <p><b>ESTABLISHMENT:</b>                  9/6/97; RCBD, 4 reps                  Plots 5'x15'; 3'x15' harvested                  18 lb. seed/acre</p>	<p><b>2000 FERTILIZATION:</b>                  18-46-0 in February and again                  after first harvest</p> <p><b>2000 PEST CONTROL:</b>                  None</p>	<p><b>2000 CONDITIONS:</b>                  Drought conditions extending back to                  August of 1999 severely limited growth.                  Precipitation was less than 50% of                  normal during the spring and summer.                  Temperatures in August and September                  were much above normal. Very little                  regrowth occurred after the second                  harvest.</p>
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**Table 4. Southeast Kansas, Mound Valley Alfalfa Performance Test, Seeded April 1998.**

NAME	Forage Yield									98-00 Total, % of Mean
	tons/acre									
	Dry Matter					1999 Total	1998 Total	98-00 Total	Total 15% Moist.	
	2000				Total					
5-5	6-13	7-11	8-14	Total	Total	Total	Total	Total	Total	
<b>RELEASED CULTIVARS</b>										
Cimarron 3i	2.03	2.03	1.55	0.68	6.28	5.36	2.15	13.79	16.22	106
WL 324	1.92	1.94	1.50	0.81	6.16	4.95	2.25	13.36	15.72	103
Pioneer 54H55	2.05	2.06	1.56	0.78	6.43	4.72	2.18	13.33	15.68	103
WL 326 GZ	1.96	2.05	1.58	0.77	6.35	4.76	2.17	13.28	15.62	102
Emperor	1.94	2.02	1.53	0.75	6.25	4.80	2.19	13.24	15.58	102
6420	1.93	1.97	1.48	0.78	6.15	5.01	2.08	13.24	15.58	102
Amerigraze 401+Z	1.89	1.96	1.46	0.75	6.05	5.06	2.12	13.23	15.56	102
ProGro	1.96	2.01	1.42	0.78	6.17	4.83	2.19	13.19	15.52	102
DK 141	2.01	1.97	1.43	0.73	6.14	4.79	2.25	13.18	15.51	102
631	1.88	1.83	1.47	0.75	5.93	4.91	2.21	13.05	15.35	101
Stamina	1.81	1.97	1.48	0.76	6.02	5.05	1.98	13.05	15.35	101
Sendero	1.75	1.96	1.45	0.80	5.96	4.84	2.19	12.99	15.28	100
Perry	1.97	1.82	1.32	0.62	5.72	5.04	2.15	12.91	15.19	100
Kanza	1.93	1.79	1.48	0.83	6.03	4.66	2.19	12.88	15.15	99
DK 142	1.87	1.86	1.49	0.67	5.89	4.85	2.11	12.85	15.12	99
Spur	1.78	1.90	1.41	0.76	5.86	4.72	1.97	12.55	14.76	97
Gold Plus	1.77	1.93	1.38	0.75	5.82	4.61	2.09	12.52	14.73	97
WL 325 HQ	1.83	1.80	1.41	0.77	5.80	4.38	2.03	12.21	14.36	94
<b>EXPERIMENTAL STRAINS</b>										
ZC9751A	1.87	1.96	1.54	0.73	6.11	4.92	2.12	13.15	15.47	101
CW 74013	1.87	2.04	1.40	0.73	6.04	4.83	2.20	13.07	15.38	101
ZC9650	1.89	1.90	1.47	0.74	6.01	4.80	2.10	12.91	15.19	100
CW 74031	1.87	1.86	1.52	0.72	5.97	4.78	2.12	12.87	15.14	99
ZC9651	1.84	1.92	1.46	0.80	6.02	4.77	2.07	12.86	15.13	99
CW 74034	1.86	1.85	1.51	0.80	6.01	4.83	2.00	12.84	15.11	99
ZC9750A	1.95	1.74	1.52	0.84	6.05	4.72	2.03	12.80	15.06	99
CW 5426	1.78	1.83	1.54	0.67	5.83	4.85	2.04	12.72	14.96	98
CW 6408	1.79	1.96	1.48	0.71	5.93	4.72	2.04	12.69	14.93	98
CW 75044	1.78	1.82	1.55	0.79	5.94	4.63	2.00	12.57	14.79	97
<b>SUMMARY STATISTICS</b>										
Average	1.88	1.92	1.48	0.75	6.03	4.83	2.11	12.97	15.26	100
LSD(0.05)	0.13	0.15	NS	0.09	0.31	0.29	0.14	0.73	0.86	6
LSD(0.20)	0.07	0.08	NS	0.05	0.16	0.23	0.11	0.37	0.44	3
CV(%)	6.08	6.54	8.22	10.21	4.31	5.12	5.73	2.88	2.88	3
MCV(%)	7.16	7.70	NS	12.01	5.07	6.02	6.74	5.63	5.63	6
<b>LOCATION:</b> Southeast Kansas Site: Southeast Ag. Research Center County: Labette Town: Mound Valley Soil: Parsons silty clay loam			<b>2000 FERTILIZATION:</b> February 9, 2000; 20-50-200			<b>2000 CONDITIONS:</b> May and June rainfall was above normal with a total of 18.84 inches. The extremely wet spring conditions gave way to very hot, dry conditions in August and September. The rainfall total for August and September was 1.72 inches, with nearly all of that coming in September. As a result, the alfalfa did not regrow after the August cutting.				
<b>ESTABLISHMENT:</b> 4/14/98; RCBD, 4 reps Plots 5'x30'; 3'x20' harvested 15 lb. seed/acre			<b>2000 PEST CONTROL:</b> Treated with Lorsban on April 6 to control alfalfa weevil. Treated with Poast Plus on July 26 to control bluegrass.							

**Table 5. South Central Kansas, Hutchinson Alfalfa Performance Test, Seeded Sept. 1999.**

NAME	Plant Height inches				Forage Yield, 2000						
					tons/acre					Total 15% Moist.	Total, % of Mean
	Dry Matter				Total						
	5-24	6-16	7-21	9-5		5-24	6-16	7-21	9-5		
<b>RELEASED CULTIVARS</b>											
WL 327	20	13	20	18	1.72	1.04	1.85	1.28	5.89	6.93	116
Magnum V	21	15	18	19	1.54	1.13	1.61	1.39	5.66	6.66	112
Aspire	21	16	18	20	1.52	1.16	1.63	1.34	5.65	6.65	112
Pioneer 54Q53	20	14	18	17	1.49	1.09	1.62	1.21	5.41	6.36	107
Forecast 1001	21	14	18	17	1.61	1.03	1.47	1.17	5.28	6.21	104
Kanza	20	15	18	21	1.35	1.02	1.56	1.23	5.16	6.07	102
DK 142	20	14	17	17	1.53	1.05	1.47	1.09	5.15	6.06	102
6420	20	13	17	17	1.48	0.92	1.60	1.12	5.12	6.02	101
Dagger+EV	19	13	17	17	1.50	0.97	1.34	1.20	5.01	5.89	99
Cimarron 3i	22	13	16	16	1.55	0.93	1.36	1.11	4.96	5.84	98
TMF 4464	19	13	17	18	1.48	0.95	1.44	1.07	4.94	5.81	98
WL 232 HQ	19	13	15	16	1.54	0.87	1.48	1.05	4.94	5.81	98
ABT350	20	15	17	17	1.41	0.98	1.45	1.08	4.90	5.76	97
Cimarron SR	21	14	16	17	1.43	0.90	1.52	1.03	4.88	5.74	96
DK 140	19	14	17	18	1.37	0.95	1.55	1.01	4.88	5.74	96
Abilene+Z	19	13	16	18	1.43	0.98	1.37	1.09	4.87	5.73	96
Award	20	15	17	17	1.53	0.97	1.36	0.99	4.86	5.72	96
Perry	20	13	16	17	1.51	0.86	1.40	1.00	4.77	5.61	94
Macon	19	14	18	17	1.05	0.87	1.50	0.95	4.37	5.14	86
<b>EXPERIMENTAL STRAINS</b>											
ZC9650	21	14	17	19	1.57	0.98	1.54	1.16	5.25	6.18	104
ZC9850A	19	12	17	16	1.36	0.88	1.52	1.15	4.92	5.79	97
<b>SUMMARY STATISTICS</b>											
Average	20	14	17	18	1.47	0.97	1.50	1.12	5.06	5.95	100
LSD(0.05)	1	1	2	2	0.18	0.10	0.22	0.17	0.46	0.54	9
LSD(0.20)	1	1	1	1	0.09	0.05	0.11	0.08	0.23	0.27	5
CV(%)	6	9	9	8	10.63	8.70	12.71	12.97	7.64	7.64	8
MCV(%)	7	11	11	9	12.53	10.27	NS	15.29	9.02	9.02	9
<b>LOCATION:</b> South Central Kansas Site: South Central Experiment Field County: Reno Town: Hutchinson Soil: Ost silt loam			<b>2000 FERTILIZATION:</b> 75-40-40 prior to planting			<b>2000 CONDITIONS:</b> The fall and winter of 1999-2000 were warmer than normal with above-normal precipitation in some months. The spring was cool and moist with uneven precipitation. Heavy rains in late July recharged soil moisture after the first two cuttings. Extremely hot, dry weather characterized August and September.					
<b>ESTABLISHMENT:</b> 9/14/99; RCBD, 4 reps Plots 5'x20', 3'x20' harvested 18 lb. seed/acre			<b>2000 PEST CONTROL:</b> Poast Plus was applied on November 29, 1999 to control volunteer oats. Treated with insecticide on April 8 to control alfalfa weevil and again on August 18 to control a severe infestation of armyworm.								

**Table 6. Southwest Kansas, Garden City Alfalfa Performance Test, Seeded August 1999.  
Irrigated**

NAME	Forage Yield, 2000						Total, % of Mean
	tons/acre					Total 15% Moist.	
	Dry Matter				Total		
5-30	7-5	8-14	9-19	Total			
<b>RELEASED CULTIVARS</b>							
WL 327	4.46	2.75	2.84	2.17	12.21	14.36	104
TMF 4464	4.47	2.74	2.81	2.16	12.16	14.31	104
Magnum V	4.53	2.72	2.76	2.14	12.15	14.29	104
Pioneer 54Q53	4.43	2.69	2.79	2.19	12.08	14.21	103
Jade II	4.53	2.64	2.77	2.08	12.01	14.13	103
Emperor	4.40	2.68	2.79	2.10	11.97	14.08	102
Cimarron 3i	4.47	2.68	2.76	2.07	11.97	14.08	102
Forecast 1001	4.28	2.67	2.77	2.16	11.87	13.96	101
ABT 400SCL	4.29	2.71	2.76	2.12	11.87	13.96	101
Pioneer 53V08	4.30	2.71	2.77	2.09	11.85	13.94	101
Affinity+Z	4.44	2.63	2.76	2.03	11.84	13.93	101
GH 750	4.36	2.65	2.74	2.04	11.77	13.85	101
Aspire	4.09	2.69	2.82	2.18	11.77	13.85	101
Dagger+EV	4.38	2.73	2.61	2.04	11.75	13.82	100
Cimarron SR	4.33	2.70	2.68	2.04	11.73	13.80	100
Abilene+Z	4.31	2.59	2.69	2.10	11.68	13.74	100
FQ315	4.27	2.63	2.67	2.05	11.62	13.67	99
6420	4.32	2.58	2.66	2.04	11.60	13.65	99
DK 140	4.23	2.65	2.66	1.95	11.47	13.49	98
DK 142	4.29	2.53	2.63	1.99	11.43	13.45	98
ABT350	4.02	2.64	2.67	2.02	11.34	13.34	97
Perry	4.32	2.54	2.54	1.91	11.30	13.29	96
Award	4.09	2.49	2.59	2.02	11.18	13.15	95
Kanza	3.84	2.42	2.49	2.09	10.83	12.74	92

(continued)

**Table 6. Southwest Kansas, Garden City Alfalfa Performance Test, Seeded August 1999.  
Irrigated**

NAME	Forage Yield, 2000					Total 15% Moist.	Total, % of Mean
	tons/acre						
	5-30	7-5	8-14	9-19	Total		
<b>EXPERIMENTAL STRAINS</b>							
ZC9850A	4.48	2.65	2.74	2.23	12.10	14.24	103
DS9705 HYB	4.43	2.69	2.73	2.13	11.98	14.09	102
ZC9650	4.41	2.70	2.73	2.09	11.92	14.02	102
DS9707 HYB	4.32	2.68	2.80	2.12	11.92	14.02	102
ZC9853A	4.47	2.57	2.76	2.06	11.85	13.94	101
ZC9851A	4.43	2.61	2.67	2.12	11.81	13.89	101
DS9704 HYB	4.47	2.62	2.72	1.99	11.79	13.87	101
CW 64025	4.24	2.63	2.69	2.11	11.67	13.73	100
ZC9854A	4.43	2.58	2.65	1.99	11.64	13.69	99
CW 84024	4.28	2.61	2.69	2.08	11.64	13.69	99
CW 74033	4.10	2.65	2.64	2.10	11.48	13.51	98
CW 74043	4.32	2.54	2.63	1.93	11.41	13.42	97
ZC9840A	4.33	2.55	2.58	1.94	11.40	13.41	97
CW 64018	4.21	2.53	2.61	2.06	11.40	13.41	97
CW 84025	3.89	2.55	2.70	2.11	11.24	13.22	96
ZC9841A	4.17	2.45	2.61	1.91	11.13	13.09	95
ZC9842A	4.06	2.47	2.57	1.98	11.07	13.02	94
<b>SUMMARY STATISTICS</b>							
Average	4.32	2.63	2.70	2.07	11.71	13.78	100
LSD(0.05)	0.19	0.11	0.13	0.12	0.43	0.51	4
LSD(0.20)	0.10	0.05	0.07	0.06	0.22	0.26	2
CV(%)	3.82	3.43	4.25	4.87	3.17	3.17	3
MCV(%)	4.47	4.02	4.98	5.71	3.71	3.71	4

<p><b>LOCATION:</b> Southwest Kansas          Site: Southwest Res.-Ext. Center          County: Finney          Town: Garden City          Soil: Keith silt loam</p> <p><b>ESTABLISHMENT:</b>          8/24/99; RCBD, 4 reps          Plots 3'x20'; 3'x20' harvested          32 lb. seed/acre</p>	<p><b>2000 FERTILIZATION:</b>          22-104-0 applied at planting</p> <p><b>2000 PEST CONTROL:</b>          None</p>	<p><b>2000 CONDITIONS:</b>          Early crop development was accelerated by the warm spring temperatures. Hot, dry conditions in August and September caused some stress to the fourth cutting.</p>
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## Appendix 1: Varieties in 2000 Kansas Alfalfa Performance Tests with unverified fall dormancy and disease and insect resistance

S N													S N													
P S B A R R													P S B A R R													
COMPANY NAME	F	B	V	F	A	R	A	P	A	S	P	K	COMPANY NAME	F	B	V	F	A	R	A	P	A	S	P	K	
	DW	W	W	N	R	A	A	A	N	H	N	L		DW	W	W	N	R	A	A	A	N	H	N	L	
<b>AgriPro</b>													DK 127													
Dagger+EV	5	H	H	H	H	H	M	H	M	R	-	L	DK 131HG	3	H	H	H	H	H	R	R	L	M	R		
Defense+EV	3	H	H	H	H	H	-	R	-	-	H	-	DK 140	4	H	R	H	H	H	H	R	M	M	H		
Depend+EV	4	H	H	H	H	H	M	R	S	M	R	-	DK 141	4	H	H	H	H	H	R	R	-	M	H		
Dominator	4	H	R	H	H	H	-	R	-	M	R	-	DK 142	4	H	R	H	R	H	R	H	-	R	H		
Feast+EV	3	H	H	H	R	H	-	M	-	-	H	-	<b>Mycogen</b>													
Yielder	3	H	H	H	R	H	-	R	-	-	-	-	TMF 4464	4	H	H	H	H	H	-	R	-	M	R		
<b>ALLIED</b>													Jade II													
Macon	4	H	H	H	H	H	H	H	-	-	-	-	<b>NC+</b>													
<b>America's Alfalfa</b>													Perry													
Abilene+Z	5	H	H	H	H	H	M	H	M	R	R	-	Ranger	3	R	-	R	L	M	-	-	-	-			
Affinity+Z	4	H	H	H	H	H	-	R	-	R	R	-	<b>NE AES &amp; USDA</b>													
Amerigraze 401+Z	4	H	H	H	H	H	-	R	-	R	R	-	NetSeeds													
Ameriguard 302+Z	3	H	H	H	H	H	-	R	-	R	H	-	NetYield500	4	H	R	H	R	H	R	R	-	R	M		
Emperor	4	H	H	H	H	H	M	R	-	-	H	-	<b>NK</b>													
<b>Cargill</b>													Geneva													
FQ315	3	H	R	H	H	H	H	R	-	R	H	-	<b>Pioneer</b>													
<b>Dairyland Seed</b>													53V08													
Forecast 1001	4	H	R	R	R	H	-	R	-	R	R	-	5454	4	R	M	H	H	H	R	R	S	M			
Magnum V	4	H	R	H	R	H	R	R	M	R	M	-	54H55	5	H	H	R	R	H	H	H	R	H			
<b>Garst</b>													54H69													
631	4	H	R	H	R	H	R	H	M	R	M	-	54Q53	4	H	H	R	R	H	M	M	-	H	M		
6420	4	H	R	H	-	H	R	R	-	R	R	-	<b>Star</b>													
645-II	3	H	H	H	H	H	-	R	-	-	H	-	Asset													
<b>Golden Harvest</b>													Sendero													
GH 750	4	H	H	H	H	H	R	R	-	M	H	-	Spur	4	H	R	H	H	H	R	H	-	M	R		
<b>Great Plains</b>													Stamina													
Cimarron 3i	4	H	R	H	H	R	R	R	-	R	M	R	<b>W-L Research</b>													
Cimarron SR	4	H	H	H	H	H	R	H	-	R	M	R	ABT 400SCL	4	H	H	-	H	H	R	H	-	M	H		
<b>KS AES &amp; USDA</b>													ABT350													
Kanza	3	R	-	-	-	-	R	R	-	-	-	-	Ace	4	H	R	H	H	H	M	R	R	H	R		
<b>MBS</b>													WL 232 HQ													
Gold Plus	4	H	R	H	H	H	H	H	-	H	R	-	WL 324	3	H	R	H	H	H	R	H	-	M	H		
ProGro	4	H	R	H	R	H	R	R	M	-	M	-	WL 325 HQ	3	H	R	H	H	H	R	M	R	R	-		
<b>Monsanto</b>													WL 326 GZ													
Aspire	6	M	R	H	H	H	H	H	R	H	-	-	WL 327	4	H	H	H	H	H	R	R	-	R	H		
Award	4	H	H	H	H	H	H	R	R	R	-	-														

**Variety characterization codes:**

FD = Fall dormancy rating
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
APH = Aphanomyces root rot race 1
SRKN = Southern root knot nematode
NRKN = Northern root knot nematode
PL = Potato leafhopper

**Fall dormancy ratings:**

Check variety	Rating
Norseman	1
Vernal	2
Ranger	3
Saranac	4
Archer	5
ABI 700	6
Dona Ana	7
Maricopa	8
CUF 101	9
UC 1887	10

**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	

Fall dormancy and disease and insect resistance ratings are from Alfalfa Varieties, a publication of the Certified Alfalfa Seed Council, NAAIC cultivar descriptions, or from developers of the varieties. Blank spaces indicate that the variety has not been tested adequately for that trait.

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## Appendix 2: Entrants in 2000 Kansas Alfalfa Performance Tests.

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### AgriPro

AgriPro Seed  
PO Box 500  
Slater, IA 50244  
877-247-4776  
www.agripro.com

### Great Plains

Great Plains Research Co Inc  
3624 Kildaire Farm Rd  
Apex, NC 27502  
919-362-1583

### NE AES & USDA

Foundation Seed Division  
UNL  
3115 North 70th  
Lincoln, NE 68507-2104  
402-472-4290

### ALLIED

Allied Seed Cooperative  
PO Box 945  
Angola, IN 46703  
800-813-5025

### KS AES & USDA

KSU - Foundation Seed  
2200 Kimball Ave  
Manhattan, KS 66502  
785-532-6115

### NetSeeds

NetSeeds  
9001 Hickman Rd  
Suite 320  
Urbandale, IA 50322  
515-331-0939  
www.netseeds.com

### America's Alfalfa

America's Alfalfa  
PO Box 404  
Princeton, IL 61356-0404  
815-875-6426  
www.americasalfalfa.com

### MBS

MBS Inc  
225 West 1st St  
Story City, IA 50248-1657  
515-733-5274

### NK

Novartis Seeds Inc  
1060 Wheatland Dr  
Buhler, KS 67522  
316-543-2707  
www.nk.com

### Cargill

Cargill Hybrid Seeds  
PO Box 5645  
Minneapolis, MN 55440  
612-742-6731  
www.seed.cargill.com

### Monsanto

Monsanto Seed  
3100 Sycamore Rd  
DeKalb, IL 60115  
815-758-9323  
www.farmsource.com

### Pioneer

Pioneer Hi-Bred Intl Inc  
PO Box 1150  
Johnston, IA 50131-1150  
515-334-6645  
www.pioneer.com

### Dairyland

Dairyland Research  
9728 S Clinton Corners Rd  
Clinton, WI 53525  
608-676-2237

### Mycogen

Mycogen Seeds  
301 Campus Drive  
Huxley, IA 50124  
515-597-3284  
www.mycogen.com

### Star

Advanced Genetics  
PO Box 414  
Beloit, KS 67420  
800-782-7611

### Garst

Garst Seed Co  
219 E Garfield  
Greensburg, KS 67054  
316-723-2454  
www.garstseed.com

### NC+

NC+ Hybrids  
PO Box 4408  
1300 N 79th  
Lincoln, NE 68504  
402-467-2517  
www.nc-plus.com

### W-L Research

W-L Research Inc  
8701 W US Hwy 14  
Evansville, WI 53536  
608-882-4100  
www.wlresearch.com

### Golden Harvest

JC Robinson Seed Co  
100 JC Robinson Blvd  
Waterloo, NE 68069  
800-228-9906

For those interested in accessing crop performance testing information electronically, visit our World Wide Web site. Most of the information contained in this publication is available for viewing or downloading. The URL is <http://www.ksu.edu/kscpt>.

Excerpts from the

**UNIVERSITY RESEARCH POLICY AGREEMENT WITH COOPERATING SEED COMPANIES**

Permission is hereby given to Kansas State University 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 860 '2000 Kansas Performance Tests with Corn Hybrids', or the Kansas Crop Performance Test website, <http://www.ksu.edu/kscpt>, for details. Endorsement or recommendation by Kansas State University is not implied."

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