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## PERFORMANCE TESTS OF RED CLOVER VARIETIES IN EASTERN KANSAS<sup>1</sup>

Gerry L. Posler<sup>2</sup>

Red clover has been used for hay or seeded in pastures in eastern Kansas many years. Alfalfa is the most important legume in Kansas, but red clover varieties with improved longevity and disease resistance, and increasing interest in legume interseeding into cool-season grass pastures have renewed interest in red clover.

Newer red clover varieties persist and yield well the third year, have excellent seedling vigor (better even than alfalfa), and can improve tall fescue and smooth brome pastures.

This study evaluated newer varieties of red clover compared with older ones like Kenland and Common.

### Procedures

Thirteen varieties were planted at Ottawa, April 1, 1977 (Spring seeding) at 10 pounds per acre. All varieties produced excellent stands, but weed

1. Contribution **81-94-s**, Department of Agronomy, Agricultural Experiment Station, Kansas State University, Manhattan, Kansas 66506.
2. Forage utilization research agronomist.

Agricultural Experiment Station  
Kansas State University  
Manhattan 66506



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control was poor because of unusual early-season rainfall. Because of the weed infestation, plots were clipped twice, but no yield data were taken in 1977. The same varieties were similarly seeded in an adjacent area August 25, 1977 (Fall seeding).

All plots were harvested for yield at early to mid-bloom stage June 6 and July 7, 1978, and May 31 and July 2, 1979. Stands of spring-seeded plots were so reduced by late summer that they were terminated. Fall-seeded plots continued and were cut August 7, 1979 and May 28 and July 9, 1980. Stand estimates were made on the fall-seeded plots November 7, 1978, April 8, 1979, and June 17, 1980. Visual estimates of maturity (% bloom) were made on the fall-seeded plots May 31, 1979. Crude protein contents were determined on selected cuttings in 1978 and 1979.

### Varieties

The varieties tested were from universities and private companies—eleven named varieties and two experimental lines.

Arlington, released by Wisconsin in 1973, has excellent resistance to northern anthracnose and powdery mildew.

Lakeland, an earlier release by Wisconsin, also resists northern anthracnose and powdery mildew.

Kenland, developed by Kentucky, resists southern anthracnose and persists longer in Kansas than common red clover.

Kenstar, released by Kentucky in 1973, is more disease resistant than Kenland and should be more persistent in eastern Kansas.

Nolin, released by Louisiana, probably lacks the winterhardiness needed in Kansas.

Florie was developed by Northrup King Company for the midsouth. It has resistance to northern and southern anthracnose and powdery mildew.

K4-183 and K4-184 are experimental lines developed by Northrup King Company that may be released in the near future.

Redman was released by Farmers Forage Research Cooperative in 1972 and is marketed by several cooperatives throughout the U.S. It resists northern anthracnose and has moderate resistance to powdery mildew.

P-A-G 808 Brand was developed and is marketed by P-A-G Seeds.

Redland was developed by the University of Illinois and is marketed exclusively by the Rudy-

Patrick Company. It has excellent winterhardiness, tolerance to powdery mildew and northern anthracnose, and has resistance to southern anthracnose.

Common red clover is seed harvested from unnamed varieties. The source of seed for this test was Sommers Seed Co., Topeka, Kansas.

Redmor was developed and is marketed by Hoffman Seed Company.

### Results

Performances of fall-seeded varieties are shown in Table 1. Total yield harvested from all varieties was quite good from both fall and spring seedings.

Mean yields for fall and spring seedings, respectively, were 4.3 and 3.8 tons/acre in 1978, and 3.1 and 1.8 tons/acre in 1979. Fall-seeded plots averaged only 1.0 ton/acre in 1980. Several of the red clover varieties had better yield potential than traditional 2-year, 2-cut varieties.

The spring-seeded plots produced lower total yields than those seeded in fall, because data were not collected during the summer after spring seeding. In relation to other varieties, Arlington yielded more when fall seeded, while Common performed better when spring seeded. Kenland, Kenstar, and P-A-G 808 Brand yielded near the top in both seeding trials, with Nolin, K4-184, and Florie producing less.

Visual estimates of stand loss indicate differences among varieties for persistence (Table 2). Data in 1980 show that Kenland, Kenstar, and 808 Brand persisted better than average, while Nolin and Lakeland were poorer.

Crude protein contents of varieties did not differ significantly in 1978 or 1979; all varieties generally contained 15 to 18 percent crude protein.

### Summary

These tests indicate that several red clover varieties have excellent yield potential in eastern Kansas. The yields obtained in the favorable 1978 growing season probably represent near the maximum obtainable, because red clover seldom yields more than 5 tons per acre.

Good yields in the third harvest season (1979 for the spring seeding and 1980 for the fall seeding) indicate that several varieties of red clover can produce well for three seasons in eastern Kansas. While spring seeding is more common, good yields also may be obtained from fall seeding.

Table 1. Performance of red clover varieties, spring-seeded, Ottawa, Kansas, 1978-1979.

Variety	Forage yield (Tons/acre dry matter)						Crude protein, %		
	1978			1979			1978-79	1978	1979
	Cut 1	Cut 2	Total	Cut 1	Cut 2	Total	Total	Cut 1	Cut 1
Arlington	2.74	0.75	3.49	0.98	0.62	1.60	5.09	18.6	16.4
Lakeland	2.61	0.98	3.59	1.11	0.69	1.80	5.39	17.8	16.0
Kenland	2.76	1.16	3.92	1.00	0.80	1.80	5.72	18.6	16.8
Kenstar	3.12	1.12	4.24	1.30	0.56	1.86	6.10	16.9	15.8
Nolin	2.58	1.12	3.70	1.04	0.56	1.60	5.30	17.3	14.7
Florie	2.67	1.09	3.76	1.13	0.67	1.80	5.56	18.9	15.3
K4-183	2.70	0.95	3.65	1.29	0.57	1.86	5.51	18.5	15.5
K4-184	2.39	1.00	3.39	0.89	0.62	1.51	4.90	19.8	15.6
Redman	2.74	1.07	3.81	1.17	0.70	1.87	5.68	18.8	14.9
808 Brand	2.72	1.15	3.87	1.14	0.74	1.88	5.75	18.0	15.4
Redland	2.79	1.06	3.85	1.24	0.67	1.91	5.76	18.0	14.6
Common	2.55	1.27	3.82	1.38	0.71	2.09	5.91	18.6	15.8
Redmor	2.69	1.07	3.76	1.13	0.68	1.81	5.57	18.6	16.8
Expt. mean	2.70	1.09	3.76	1.14	0.66	1.80	5.56	18.4	15.7
LSD <sub>.05</sub>	0.28	0.32	0.49	NS	NS	NS	0.58	NS	NS

Table 2. Performance of red clover varieties, fall-seeded, Ottawa, Kansas, 1978-1980.

Variety	Forage yield (Tons/acre dry matter)											Stand, %			Crude protein, %			Bloom, %
	1978			1979				1980			1978-80	Nov.	Apr.	June	1978	1979	1979	1979
	Cut1	Cut2	Total	Cut1	Cut2	Cut3	Total	Cut1	Cut2	Total	Total	1978	1979	1980	Cut1	Cut1	Cut3	Cut1
Arlington	3.47	1.11	4.58	1.77	1.02	0.59	3.38	0.84	0.08	0.92	8.88	73	79	32	17.0	17.0	17.0	9
Lakeland	3.26	1.15	4.41	1.58	0.97	0.57	3.12	0.90	0.06	0.96	8.51	59	62	21	18.0	16.2	16.9	19
Kenland	3.05	1.53	4.58	1.78	1.01	0.63	3.42	1.04	0.05	1.09	9.08	73	74	62	17.0	17.1	18.4	17
Kenstar	3.10	1.26	4.36	1.69	1.04	0.59	3.32	0.92	0.08	1.00	8.67	74	77	55	16.4	17.1	17.3	15
Nolin	2.68	1.09	3.77	1.18	0.57	0.62	2.37	0.93	0.09	1.03	7.19	40	34	12	17.3	14.7	15.6	88
Florie	2.99	1.09	4.08	1.52	0.88	0.55	2.95	0.95	0.06	1.02	8.04	52	45	40	16.8	17.4	17.6	9
K4-183	3.52	1.24	4.76	1.50	0.92	0.65	3.07	0.94	0.07	1.01	8.84	67	60	44	15.2	16.4	17.1	10
K4-184	2.77	1.21	3.98	1.25	0.96	0.58	2.80	0.85	0.07	0.92	7.69	57	57	42	18.4	18.2	17.5	4
Redman	2.98	1.34	4.32	1.71	1.01	0.59	3.31	0.86	0.07	0.93	8.56	60	64	40	16.6	16.0	18.2	16
808 Brand	2.93	1.33	4.26	1.80	0.93	0.64	3.37	1.11	0.07	1.18	8.82	71	70	62	18.0	15.9	15.8	19
Redland	3.03	1.23	4.26	1.50	0.96	0.62	3.09	1.01	0.07	1.08	8.43	65	62	36	17.8	16.8	17.9	15
Common	3.01	1.17	4.18	1.66	0.92	0.60	3.18	0.93	0.11	1.04	8.39	65	70	31	16.8	15.6	17.5	26
Redmor	3.23	1.25	4.48	1.69	0.76	0.63	3.08	1.04	0.06	1.10	8.67	62	69	44	17.6	17.6	17.4	19
Expt. mean	3.08	1.23	4.31	1.59	0.92	0.61	3.12	0.95	0.07	1.02	8.44	63	63	40	17.1	16.6	17.3	20
LSD <sub>05</sub>	0.43	0.22	0.50	0.22	0.18	NS	0.31	NS	NS	NS	0.68	12	11	15	NS	NS	NS	10